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Chapter 1

INTRODUCTION TO DERMATOLOGY

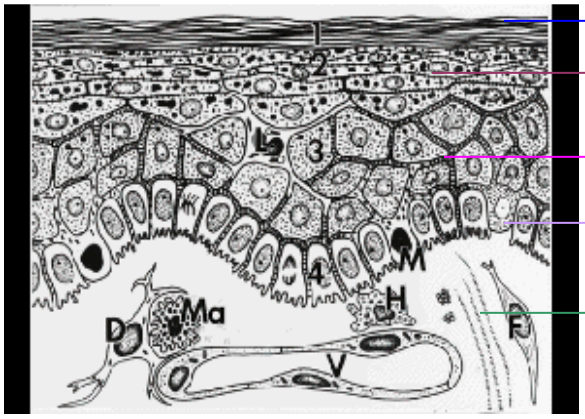
Basics of Dermatology

STRUCTURE OF SKIN:

- Skin is the largest organ of the body and weighs 4kg in average adult. The average surface area of skin is $2m^2$
- **Composed of three functional layers:**
  - Epidermis
  - Dermis
  - Subcutaneous layer (Panniculus)

Epidermis:

Outermost layer of the skin is derived from ectoderm, and has got following layers, if seen bottom to top



Stratum Basale	Single columnar or cuboidal cells layer, Actively dividing layer of Epidermis, also known as Stratum Germinativum.
Stratum Spinosum	Thickest layer of epidermis;five to seven layers of polyhedral cells with large round nuclei, also known as Prickle Cell Layer / Stratum Malphighi.
Stratum granulosum	Flattened cells with keratohyaline granules.
Stratum Corneum	Flattened anucleated cells,also known as absolute dead skin layer or Horny cell layer. No nuclear activity

- Stratum Granulosum and corneum are absent in Mucosa except dorsum of tongue & hard palate
- Palms & Soles have clear cell layer between stratum corneum and stratum granulosum known as Stratum Lucidum or stratum conjunctum, not absolute dead skin layer.
- Epidermal turnover time is 28-57 days.

Epidermal cells:

Keratinocytes:

- Derived from undifferentiated blast cells, comprises 80-90% of the epidermal cells.
- Contain lamellar bodies or Odland bodies or membrane coating granules.
- Odland bodies play important role in water loss barrier function and intercellular cohesion within the stratum corneum. ***Keratin*** – skin derives its Protective nature because of Keratin.

Melanocytes:

- Dendritic cells, Derived from neural crest during embryonic life.
- Present in basal layer of epidermis, having keratinocyte/melanocyte ratio of approx.10/01.
- Synthesize melanin and transfer it to keratinocytes.

Langerhan Cells:

- Dendritic cells derived from bone marrow,known as antigen presenting cells.
- Present in prickle cell layer of Epidermis
- Express HLA – DR & antigen CD_4 & CD_1 also have surface receptor for C_3 & F_C fragment of IgG and can secrete interleukins.
- Contain characteristic organelles "Birbeck granules" (Tennis racquet shaped structure)

Merkel Cells:

- Dendritic cells, Neuro-ectodermal in origin.
- Present in basal layer of epidermis, oral cavity &bulge portion of hair follicle, lips, and digital tips.
- Act as mechanoreceptors for touch sensation and contain neurotransmitters.
- ***A narrow clear zone between epidermis and dermis is known as Grenz Zone***

Dermis:

- Mesodermal in origin ***except nerves***, Provides support and nourishment to Epidermis.
- Comprises of connective tissue, mainly composed of collagen fibers (75%) and reticulin or elastic fibers.
- Amorphous ground substance glycosaminoglycans, blood vessels, nerves, lymphatics and muscles.

Divided into

- Superficial papillary dermis
- Deep Reticular dermis.

Cells of Dermis: Histiocytes, Lymphocytes, Fibroblasts and Mast cells.

Subcutaneous Layer: It is made up of Adipose cells, Sweat glands, blood vessels and Nerves.

Skin Appendages:

Sweat glands: Two types:-

Eccrine glands	**Apocrine glands:**
• Present all over the skin, particularly Palms, and soles. • Situated in dermis & are absent in mucosa. • Secrete watery hypotonic secretions, containing Chloride, Lactic acid, Fatty acid, Urea, glycoprotein & Mucopolysaccharides.	• Vestigial remnants of odoriferous glands of lower animals. • Found in the axillae, anogenital areas, scalp, andnipples. • Start functioning at puberty. • Secretion is sterile but because of bacterial action, gives unpleasant smell.

- **Modified apocrine glands** are mammary glands, Mohl's glands in eyelids & Cerumin glands in external auditory canal.

Sebaceous glands: Holocrine glands occuring in conjunction with hair follicle known as Pilo sebaceous unit.Present all over the body except palms & soles.

- Scalp & face,interscapular area, sternal area & periumblical area are main Seborrheic areas.Produce secretion Sebum, made up of mainly squalene fatty acids, cholesterol esters, wax & wax esters.

Ectopic sebaceous glands

- Fox Fordyce spots – Lips
- Tyson's gland - Penis.
- Meibomian's glands of eyelids
- Montogomary Tubercles of breast

Hair: Shaft of keratinized cells produced by the Hair bulb present deep in dermis.
Project through the skin from the Hair follicle, richly supplied by Nerves & Blood vessels.
Contains melanin

A. **Eumelanin** : Brown or black colour.
B. **Pheomelanin :** Yellow to reddish brown shade

Types of Hair:

1. Lanugo: lanugo hairs are long, fine, and silky in texture,found over entire body. Present only in embryonic life.
2. Vellus: Short, fine and often non pigmented. Present mainly over malar region of face
3. Terminal: pigmented, and tends to be much longer and coarser then vellous or lanugo hair. Present over scalp, eyebrows, axillae, pubic hair.

Hair Cycle:- Consists of three phases:

Anagen:

- Actively growing phase; contains pigmented hair bulb, and inner root sheath.
- Duration is 3 – 5 yrs; 90% of total scalp hair, Grows at the rate of 0.4-mm/ day (scalp)

Catagen:

- Destructive or transitional phase; has many apoptotic cells in outer root sheath
- Duration up to 3 weeks; 1%-3 % of scalp hair

Telogen:

- Resting phase; has nonpigmented bulb,
- Duration up to 3 months; 8 – 9% of total scalp hair.
- Has a depigmented Narrow "club" which differentiates it from anagen hair.
- Hair at different body areas vary in ratio of these growth cycle phases.

Nails:

- Hard, translucent plate of hard keratin (high sulphur content).
- Grows Beneath the proximal nail fold.
- Fingernails grow at the rate of 0.1mm / day or 1cm in 3 months.
- Toe nails grow at the rate of 0.03 mm / day

- Nail growth is affected, in many cutaneous and systemic diseases.

Functions of Skin:

1. Protection against harmful foreign bodies & organisms.
2. Maintains body temperature.
3. Prevents excessive loss of body fluids
4. Production of Vit. D in presence of sunlight.
5. Sensory function
6. Immunological function
7. Esthetic and beauty qualities

Terminology of Skin lesions

LINEAR: lesions appearing in a line, e.g. Contact dermatitis, Koebner phenomenon.

ANNULAR: Ring – shaped with active border and central clearing

IRIS or TARGET: Bulls eye lesion – Erythema Multiforme

CIRCINATE: Circular – herald patch of p. rosea (Coin Shaped)

NUMMULAR: Coin shaped

GUTTATE: Drop like (Shower like)

MORBILLIFORM: Small papules merging into unusual shapes e.g. measles

RETICULATED: Net like- livedo reticularis

HERPETIFORM: Grouped vesicles, papules – herpes

SCALANIFORM: Scarlet fever – sheet like

Primary skin lesions:

Terminology	Description
Macule	Change in skin colour < 0.5 cm
Patch	Macule > 0.5
Papule	A raised circumscribed solid lesion < 0.5 cm
Plaque	papules coalescence to form a plaque > 0.5 cm
Vesicle	A fluid filled lesion < 0.5cm in size
Bulla	A fluid filled lesion > 0.5 cm in size
Nodule	A solid raised as well as deep circumscribed lesion of skin > 0.5 cm
Wheal	Evanescent, raised erythematous area of skin of various sizes can be itchy or non itchy depending on the type.
Petechiae	Pinhead sized macule of blood in skin (1 – 2mm)
Purpura	Extravasation of blood, which is not compressible > 2 mm
Telangiectasia	The visible dilation of small cutaneous blood vessels.

Secondary Lesions:

Terminology	Description
Scale	Flakes arising from the horny layer.
Crust	Dried tissue fluid or blood
Erosion	Superficial breach in integrity of epidermis
Excoriation	Linear erosion marks produced by scratching
Pustule	A pus filled vesicle

Ulcer	Breach in continuity of skin may extend up to dermis, subcutaneous tissue.
Atrophy	Thinning of skin
Hypertrophy	Thickening of skin
Sinus	A channel that permits the escape of fluid or pus with one blind end.
Lichenification	Hyper pigmentation of skin with thickening & increased skin markings.
Erythroderma	If > 90% of body surface area is inflamed with scaling,also known as exfoliative dermatitis.
Scar	Collection of Fibrous tissue replacing normal dermal constituents

Histopathological terms:

Acanthosis	Increased thickening of stratum spinosum
Parakeratosis	Presence of nuclei in stratum corneum.
Hyperkeratosis	Hyperproliferation of stratum corneum
Dyskeratosis	Faulty keratinization e.g. Darrier's disease
Acantholysis	Loss of adhesion between keratinocytes leading to formation of rounded cells
Spongiosis	Intraepidermal intracellular oedema
Exocytosis	Extravasation of cells from blood vessels in dermis, if moves into epidermis known as ***Epidermotropism***.
Micro abscesses	Presence of non-epidermal cells in epidermis e.g. Munro Micro abscess - Psoriasis, Spongiform pustule of kogoj - pustular psoriasis, Pautrier's abscess - Mycosis fungoides, Papillary tip micro abscess -Dermatitis herpetiformis

Clinical Tests:

1. Diascopy: Process of seeing the skin through the glass slides.
2. Wood's Lamp Examination: - 360-65 nm, objects fluorescence under it, filter Nickel oxide.
   - Tinea – brightgreen,or yellow green
   - Tetra – Yellow
   -Erythrasma—coral red
   -porphyrias – pink
3. Nikolsky Sign: Positive in Pemphigus Vulgaris
4. Bulla spread sign: Positive in Pemphigus Vulgaris
5. Auspitz sign: Positive in Psoriasis
6. Darrier's sign: Urticaria Pigmentosa
7. Psedo-darrier sign : congenital smooth muscle hamartoma
8. Dimple Sign: Dermatofibroma
9. Dermographism: Triple response of Lewis
   RAW - Redening - Flare - Wheal
10. Tzanck Test: Test to demonstrate the tzanck cells
    Giemsa stain is used, Herpes Zoster, Chicken pox,pemphigus
11. Acetowhitening test: Penile warts (Sub clinical)
12. Patch test: Contact allergic dermatitis
13. KOH Examination: - 10 – 20% KOH
    - Fungal infections

Chapter- 2

INFECTIOUS DISORDERS OF SKIN

Viral infections of skin

Skin and mucosa Can be infected by both DNA and RNA viruses, the common ones being herpes virus, human papilloma virus, pox viruses especially molluscum contagiosum virus, coxsackie and ebstein barr virus. The cutaneous manifestations may occur as a primary skin infection (exanthem or enanthem) or secondary to a systemic involvement like Pityriasis rosea, erythema nodosum, erythema annulare centrifugum etc.

Common Viral infections of the skin :

Molluscum Contagiosum:-

- Molluscum contagiosum virus a member of the poxvirus group is a largest known DNA virus, which replicates in the cytoplasm of infected cells.
- **Incubation period** – 2 to7 weeks.

Clinical features:-

- It is a very common infection in children age 2-4 yrs, and spread is through direct contact .Usually asymptomatic,but occasionally pruritic, lesions are discreet, smooth, and pearly to flesh-colored, dome-shaped papules, often with central umbilication and a mildly erythematous base. Beneath the umbilication lies a white currant-like core, which may be easily expressed.
- The lesions are common over face, hands and during sexual transmission over the anogenital region.They are usually grouped in one or two areas, but occasionally occur widely disseminated, particularly in patients of atopic dermatitis and AIDS.

Histopathology-

- Epidermis is hypertrophic and hyperplastic. Above a normal-appearing basal layer are lobules of enlarged epidermal cells which contain multiple intracytoplasmic inclusion bodies. These inclusion bodies, which contain the viral particles, increase in size as the infected cell moves toward the surface. In the horny layer, the molluscum bodies are enmeshed in a fibrous network which dissolves in the center of the lesion.

Course

- Spontaneous remission of molluscum contagiosum suggests an immunologic response. The nature of this response, however, has not been well delineated.

Treatment

- Curettage with cauterization of base with TCA
- Extirpation with needle
- Oral – Cidofovir

Wart:

- Firm asymptomatic hyperkeratotic papule or plaque caused by DNA virus – ***Human Papilloma Virus***. Human papilloma viruses belong to papovavirus group of ds DNA viruses that infect the squamous epithelia of human causing asymptomatic warty growths of the skin. To date,> 100 types of HPV have been recorded.
- Commonest viral skin infection.
- Transmission by Direct/Indirect contact, trauma, genital inoculation, swimming pools, meat handling or delivery through infected genital passage etc.

Types of Warts:

(a) Non genital Warts
(b) Genital Warts

(a) Non genital warts

Common warts (Verruca Vulgaris)

- Caused mainly by HPV-2 (also HPV 57, 27, 1 & 4) is an elevated, asymptomatic rounded tumorous growth with a rough or verrucus , grey dry surface seen mostly over the dorsum of hands, knees but can be present anywhere on the skin.

Plane warts (flat/V. plana)

- Plane warts caused by HPV 3 & 10, seen as multiple, 1-3mm size, smooth, flat skin colored papules over the face, also called Verruca plana juvenilis, other sites may also be involved.

Plantar Warts:

- Caused mainly by HPV-1, are usually painful. Trauma is the most important predisposing factor along with hyperhydrosis & flat foot. Plaque of closely associated grouped warts called ***Mosaic or Myrmecia Warts***.

Filiform and digitate warts are usually, single, soft shrub like/finger shaped, thin projections seen over the scalp, fingers, face and neck.

❖ ***Basal cell papilloma is also known as Seborrocic wart***

(b) Genital warts (condyloma acuminatum)

- Caused mostly by HPV 6 and 11, are present over the perianal and genital areas.
- Commonest benign growth of penis, transmitted by sexual contact
- Commonly involved site is Coronal Sulcus of Penis.

Massive genital warts are known as 'Buschke – Lowenstein Tumour '. Develops in preputial sac & erodes & ulcerates the prepuce. Premalignant condition.

Diagnosis- Besides, the characteristic clinical appearance, the diagnosis can be confirmed on histopathology by presence of vacuolated cells called koilocytes and inclusion bodies.

Course-The disease is usually benign with spread promoted by minor trauma like shaving and the lesions usually disappear within 1-2 yrs. but HPV has been associated with many malignant and premalignant lesions as well, especially cervical dysplasia, Bowenoid papulosis, Buschke lowenstein disease, oral leukoplakia etc.

Treatment- No single therapy is universally effective for all types of warts.
It depends on, location of the wart and extend of disease,age and immunologic status of the patient.Treatment includes both **topical application and surgical methods**.
Topical Rx- Application of caustics (TCA, etc), salicylates,
Podophyllin /podophyllotoxin, Gluteraldehyde, formalin, Retinoids etc.
Surgical Rx. Cryotherapy Electro- dessication, Laser etc. Interferons,

I/L Bleomycin and topical 5- FU have also been used.

Epidermodysplasia verruciformis

- Rare , autosomal recessive disorder characterized by widespread human papilloma virus infection and cutaneous sqamous cell carcinoma. It presents in childhood and continues throughout life.skin lesion includes, abundant flat warts on dorsal hands, extremities, face, and neck. These flatter than typical flat warts and growing to confluence. Associated **hpv**s are HPV-5, 8, 9, 12, 13, 14,15, 17,19, etc **hpv**-3 and 10 may also be seen. Scc develops in 30% to 60 % of patients.

Histopathology the cells in upper dermis have a clear , smoky blue pale cytoplasm and a central pyknotic nucleus.
Treatment largely preventive measures to avoid malignancy ,ie sun protection,

Herpes Viruses

Herpes Simplex

- It is a vesicular, frequently recurrent viral infection caused by a herpesvirus group,which are medium sized DNA viruses.

HSV -1 Classically facial infections.(fever blister/cold sore)
HSV -2 Classically genital infections.

Mode of Transmission -contact- Direct-infected saliva or genital secretions Indirect-fomites

Clinical Features:- Tender grouped vesicles on an erythematous base,which are self limited , near or at mucocutaneous junctions.

- Lesions are preceded by localized itching, burning and erythema for a few hrs/minutes.
- Vesicles contain clear/purulent fluid, rupture in a few days to give rise to crusting below which regrowth of normal skin occurs and the lesion heals without scarring usually in a week.
- Most common sites of infection, lips and other parts of the face followed by the genitalia.
- Strong tendency of recurrence at the same site owing to its property of undergoing latency/inactive persistence of the virus in the ganglion of the sensory nerve supplying the region.
- Recurrence (or secondary episode) in contrast to the 1st (i.e. primary) episode is less severe and has a shorter duration.
- **Important clinical types**

i. **Herpes labialis**- (cold sore, fever blister) Infection of the lips
ii. **Herpetic Gingivostomatitis**- Gums, buccal mucosa, tongue, tonsils and the palate.
iii. **Intrauterine infection**- most commonly caused by hsv2 virus, though some cases can be caused by hsv1 as well. If pregnant lady gets infected can cause abortion, still birth or premature delivery & in the baby can result in congenital malformations of microcephaly, microphthalmos, encephalitis etc. associated with skin lesions.
iv. **Neonatal infection**- Mostly contracted during passage of child through the infected birth canal of the mother during delivery. Besides skin lesions, it can cause severe disease - encephalitis, hepatitis, chorio retinitis, pneumonia and coagulopathy. A caesarian section is indicated if the mother is seen to have herpetic infection of her genitalia:
v. **Herpes progenitalis**- Genital infection, both in males and females.
vi. **Herpes Gladiatorum**- as a result of close skin to skin contacts e.g. in wrestlers/ Rugby players.
vii. **Keratoconjunctivitis**- Most common cause of blindness in USA. It causes a punctate/geographic i.e. dendritic form of keratitis, later leading to corneal ulceration, scarring and blindness.
viii. **Herpetic Whltlow (FELON**)- Infection of the pulp of finger, finger tip e.g. In Dentists or health personnel's.
ix. **Eczema herpeticum**- Superinfection of herpes over a primarily eczematous skin due to a variety of diseases like atopic dermatitis. Also known as **Kaposi varicelliform eruption**.

Diagnosis

a) Tzanck smear will reveal epithelial multinucleated giant cells.

b) H/p- the skin shows thick walled vesicles due to intra & intercellular edema and the infected epithelial cells show characteristic ballooning due to edema.. The viral particles are seen inside cell as intranuclear mass as an intranuclear inclusion body, known as cowdry bodies.
c) Virus culture from the infected fluid.
d) Direct fluorescent antibody (DFA) test, PCR

Treatment - Oral Acyolovir- The most effective antiviral drug in herpetic infections.

- Dosage- oral 200 mg 5 times/day X 5-7 days.I/V - 5 mg/kg 8 hr. ly X 5-7 days.
- In neonates - 250 mg/m2 body surface area every 8 hours X 5-7 days. Infrequently recurrent diseases, suppressive Rx is indicated with 200 or 400 mg B.D. X 1 year.
- Newer antivirals Valaciclovir, Famcilovir, Penciclovir can also be given. Acyclovir resistant I/V foscarnet is the drug of choice.

Herpes Zoster (shingles)

- Caused by Varicella Zoster virus, considered as a reactivation of a dormant virus after causing primary infection in the form of chicken pox
- First manifestation of zoster is pain, may be accompanied by fever, headache, malaise & tenderness localized to areas of one or more dorsal roots.
- Average duration between pain & eruption is 1.4 days in trigeminal zoster & 3.2 days in thoracic.
- Most common site is thoracic dermatomes (53%), others are cranial (20%), sacral &lumbar.
- Cluster of painful vesicles on erythematous base, in dermatomal course are seen
- Lesions are usually unilateral & self limiting
- Acyclovir is the drug of choice

Complication:

- Secondary bacterial infection
- Post. Herpetic neuralgia

Ramsay Hunt Syndrome: H. zoster involving Sensory branch of Facial nerve, and auditory nerves. Caused because of inflammation of geniculate ganglion.

Herpes Zoster Ophthalmicus :

It is due to the involvement of ophthalmic division of trigeminal nerve by H. Zoster.

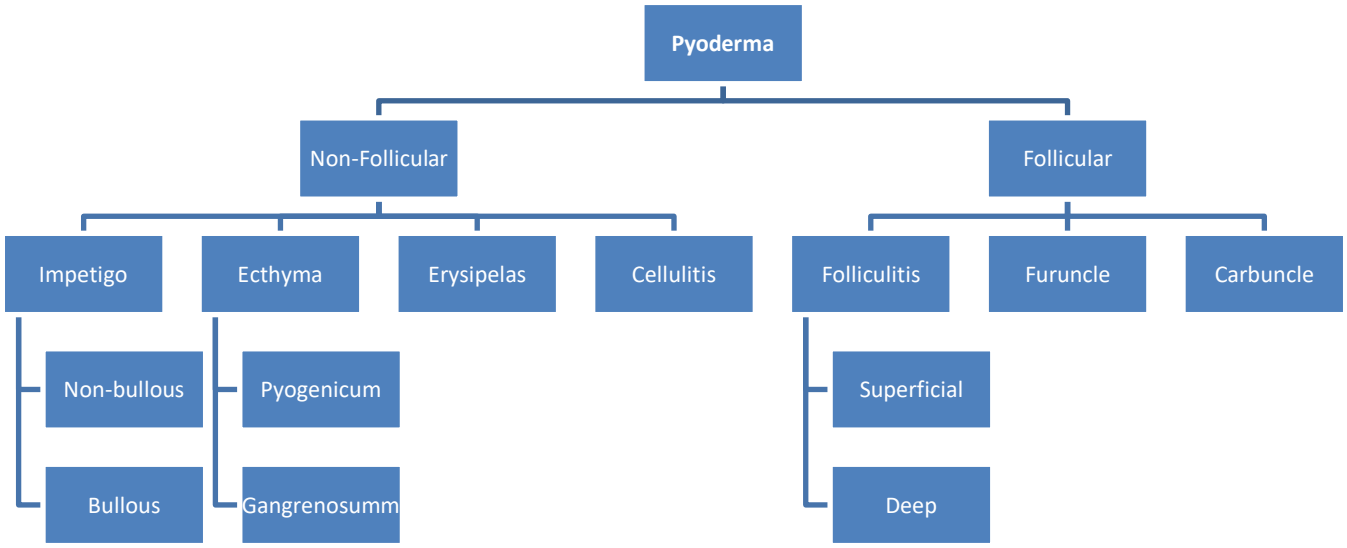
Other Herpes Viruses

- HHV-4 causes infectious mononucleosis
- HHV-6 Causes Roseola infanticum/sixth disease/ Exanthema subitum.
- HHV-7 Chronic fatigue syndrome and P. rosea
- HHV-8 Assoc. with Kaposi's sarcoma.

BACTERIAL INFECTIONS OF SKIN:

- Infections can be caused by gram positive, gram negative and anaerobic bacteria.
- Commonly seen in hot and humid climate. Infections caused by gram positive bacteria are called pyodermas.
- **predisposing factors** Poor hygiene, overcrowding, improper sanitation and malnutrition .

***Primary Pyodermas* (Pyoderma arising in the normal skin)**



1. **Impetigo**: Contagious superficial infection of skin.

Caused by Staph. Aureus, Streptococcus or both

Two types:

1. ***Bullous Impetigo***:-
   - Caused by Staph aureus, commonly in the newborn and in older infants. Sites of predilection are the face and the extremities.
   - Characterized by the rapid progression of vesicles to flaccid bullae occurring on a normal skin, containing clear yellow fluid that subsequently become dark yellow and turbid.
   - Bullae are formed because of Exotoxin F Secreted by Staph aureus phase II, type 70 & 71 or 55.
   - Complications includes pneumonia, bacteremia,meningitis.

2. ***Impetigo Contagiosa***:
   - Caused by Streptococcus & Staph aureus both. Sites of predilection are the face and the extremities.
   - Starts as a small, reddish macule which may soon turn into a vesicle.
   - Vesicle has a thin roof that ruptures', leaving a raw, oozing area that quickly evolves into a yellowish ***honey colored*** crusted plaque. Can be seen in the complication of pediculosis capitis,scabies
   - Complications acute glomerulonephritis.

Treatment: Antibiotics & personal hygiene

Ecthyma: Untreated Impetigo can extend more deeply, producing shallow ulcer with black leather crusting, known as escar.

Ecthyma gangrenosum is a cutaneous ulcer caused by Pseudomonas aeruginosa.

- Resembles staphylococcal and streptococcal ecthyma which is known as **Ecthyma pyogenicum**.
- Commonly seen on the lower extremities and buttocks of children or neglected elderly patients or individuals with diabetes mellitus,leukemia,terminal cancers etc

Folliculitis: Superficial infection of single hair follicle, caused by Staph & Streptococci.
May manifest either as superficial or deep folliculitis.

Superficial folliculitis (impetigo of Bockhart) presents as a pinpoint to pinhead sized thin walled pustule at the follicular orifices,developing in crops and healing in few days.commonly caused by s.aureus.
Sites of predilection are scalp and extremities.

Deep folliculitis

- Infection extends deep in and around the hair follicle, the resulting perifolliculitis is responsible for marked inflammatory response.
- Morphological variants are Sycosis barbae, furuncle, carbuncle, stye and perforating folliculitis of the nose.
- Multiple furuncles coalesce to form **Carbuncle** – Seen in diabetics.

Sycosis barbae:

- Deep folliculitis of beard area and upper lip, characterized by inflammatory papules and pustules with a tendency of recurrence.

Furunculosis:-

- or boil, is acute,round,tender,circumscribed perifollicular stap. Abscess with central suppuration,sites are nape of the neck,axilla and buttocks, are seen in malnutrition,AIDS,diabetes etc

Diagnosis: Usually clinical but gram staining and culture of the exudates are helpful in the diagnosis
***Treatment*:** Antibiotics & Personal hygiene

Botryomycosis uncommon, chronic, indolent disorder caused mainly by **s**. aureus, though pseudomonas, E. coli, proteus and streptococcus can be seen. Characterized by nodular, crusted, purulent lesions and discharging sulfur granules, healing with atrophy. Predisposing factors are diabetes, HIV, alcoholism, altered immune function.
Treatment : appropriate antibiotics, surgical drainage , excision.

***Erysipelas*:** Erysipelas presents as a painful, bright red edematous indurated plaque with an advancing raised border, sharply demarcated from the surrounding normal skin. It is infection involving dermal lymhphatics.
Legs and face are the most commonly involved sites.

Cellulitis: Deep seated infection involving the subcutaneous tissue.
Lesions in the cellulitis are flat and no clear cut demarcation from uninvolved skin is seen.
Constitutional symptoms are more pronounced.

Secondary pyodermas: Cutaneous lesions such as an abrasion, wound, eczematous lesion, fungal infection, ulcer and scabietic lesions may become secondarily infected.

TUBERCULOSIS OF SKIN: Constitutes about 10% of all extra – pulmonary tuberculosis which in turn constitutes only a fraction of all cases of tuberculosis

Tuberculosis of skin can be classified as:

Types	Mode of infection	Bacilli	Immunity	Tuberculin
Primary TB				
* TB chancre	Inoculation	+++	+++	-
* Miliary TB	Hematogenous	++	-	-
Secondary TB				
* Lupus vulgaris	Inoculation/hematogenous	+/-	+++	+++
* TBVC	Inoculation	+	+++	+++
* Scrofuloderma	Contiguous	++	+++	++
* TB gumma	Hematogenous	++	+	+
* Orificial TB	Autoinoculation	++	+	-
Tuberculids	Hematogenous	-		+++
* Papulonecrotic	"	-	+++	
* Lichen	"			+++
Scrofulosorum	"	-	+++	+++

* Erythema induratum	"	-	+++	

Primary tuberculosis

Tuberculous chancre

- Occurs due to exogenous implantation of tubercle bacillus into the skin of an individual, usually a child without previous exposure to bacilli.
- It is commonest on legs, can be seen on face or arm.
- Presents as a brownish red papule or nodule that ulcerate to form a ragged ulcer with undermined edge Associated with regional lymphadenopathy
- If untreated, chancre heals slowly over months

Cutaneous Miliary Tuberculosis

- Seen in infants and children or immunocompromised
  - ❖ Skin lesions manifest as crops of bluish papules,vesicles, pustules or hemorrhagic lesions
  - ❖ Haematogenous spread

  Diagnosis established by skin biopsy which shows acid fast bacilli

The primary source of TB should be identified and treated

Lupus Vulgaris : Most common type of progressive cutaneous tuberculosis.

- Seen in people with moderate or high immunity.
- Arises from normal skin but it can arise in a scar of scrofuloderma
- The initial lesion is a dusky red or brown, soft, gelatinous plaque which increases in size and extends peripherally with central scarring.
- Diascopy reveals 'apple jelly' nodules at the periphery
- The various morphological forms are plaque type, ulcerative and mutilative form, vegetative form and tumor like
- Nasal mucosa can be involved leading to resultant destruction of nasal septum.
- Rarely squamous cell carcinoma can occur

Tuberculosis Verrucosa Cutis: TBVC,(warty tuberculosis, anatomist's wart) : (**exogenous**)
Tuberculosis verucosa (TBVC) manifests as a warty growth that occurs as result of inoculation of mycobacteria into the skin of previously infected individual with moderate to high immunity

- Warty growth seen over exposed areas such as foot, hands, ankles and rarely buttocks
  - No lymphadenopathy
- TBVC should be differentiated from other warty lesions such as verruca vulgaris, chromoblastomycosis, hypertrophic lichen, leishmanisis and tertiary syphilis

❖ **Scrofuloderma (**tuberculosis colliquativa**)**: Contagious spread of TB may be from underlying lymph nodes, fascia or bones

- ❖ Most common site cervical lymph nodes
- ❖ Begins as bluish-red swollen, painless area.
- ❖ Undermined Ulcer with bluish edges
- ❖ The resultant sinuses and fistula heal with puckered scarring

Tuberculous gumma (metastatic tuberculosis ulcer)

- It occurs due to hematogenous dissemination during periods of bacillemia and lowered resistance
- Common in poorly nourished children
- Presents as firm subcutaneous nodules that softens and ulcerates to form undermined ulcer

Orificial Tuberculosis:- Seen in Immunocompromised people
Seen over the lips, tongue, genitalia as reddish nodules that break to form painful

Ulcers
Occurs due to auto inoculation from advanced internal GIT tuberculosis.

Tuberculids:-

a) Hypersensitivity reaction to the tuberculosis infection at different sites.
b) Clears with anti tuberculosis therapy.
c) Bacilli are not found in the lesions

Types: ***Lichen Scrufulosorum***

- Seen in children
- Multiple grouped brownish papules all over the body, most commonly trunk
- Most common source of TB Lymphadenitis.

- ***Papulonecrotic tuberculid*** : It is an eruption of necrotizing papules, particularly affecting extremities and occurring in more or less symmetric crops
- The lesions are hard, dusky papules that crust or ulcerate to heal with atrophic scar

Erythema induratum

- It is persistent or recurrent erythematous tender nodular lesions (usually ulcerate in contrast to erythema nodosum) that occur secondary to tuberculosis focus elsewhere
- The lesions are localized to legs (calf region) of middle aged women with erythrocyanotic circulation

Diagnosis

Absolute criteria

- Positive culture for M. tuberculosis
- Guinea pig inoculation
- PCR for M. tuberculosis

Others

- Proven TB elsewhere in the body
- Presence of AFB in the lesion
- Histopathology
- Positive tuberculin test
- Clinical history and physical signs
- Response to therapy

Treatment:

- Anti TB,
- 4 drugs – RHEZ – 2 months
- 2 drugs – RH – 4 months

Atypical myobacterial infections

- Atypical mycobacteria can present with varied cutaneous features in normal as well immunosuppressed patients.

Summary of atypical mycobacterial infections

Organism	**Disease**	**Clinical Features**	**Treatment**
M. marinum	Swimming pool granuloma, fish tank granuloma	Warty plaque or sporotrichoid lesions on knees, elbows and feet	minocycline or Rifampcin and ethambutol
M. ulcerans	Buruli ulcer	Solitary,hard,painless,Subcutaneous nodule ruptures to form shallow ulcer with necrotic fat in the floor Seen on extremities.	Surgery is the treatment of choice followed by rifampin or cotrimoxazole
M. avium complex		Nodules, leg ulcers and papules Disseminated heterogenous infection in HIV patients	Combined therapy of isoniazid, rifampin and clarithromycin

M. chelonae M. fortuitum	Injection abscess	Cellulitis and subcutaneous	Surgical debridement & amikacin or doxycycline or ciprofloxacin

LEPROSY:

Definition:- Chronic granulomatous infectious disease of skin & peripheral nerves, Caused by Mycobacterium Leprae, also known as ***Hansen's disease.*** Skin, muscles, eyes, bones, testes and internal organs can also be involved.

Etiopathogenesis: Causative organism Mycobacterium Leprae is a weak acid fast obligatory intracellular bacilli, Discovered by Gerhard Henrik Armauer Hansen in 1873 in Norway.
Can be grown in foot pad of mice & nine banded Armadillos.
Very low infectivity
Risk of children acquiring infection from infected adults in the family is 60%.
❖ **Transmission**: Still uncertain but most likely spread is via droplet mode, from untreated patients nasal mucosa,other routes can be skin to skin or may be via GIT.
❖ Generation time is 12 days, Incubation period is 2 – 7 yrs. (average 3-5 yrs)
❖ The optimal temperature for growth for lepra bacilli is 30-33 centigrade
❖ Virulence factor of M. Leprae is phenolic glycolipid I, a surface lipid, specific to this bacillus.
❖ Common sites which are involved – Skin, Peripheral Nerve, generally involves every organ except CNS & Ovaries and lungs.
❖ M. Leprae attacks Schwann cells of peripheral nerves, unmyelinated are more affected.
❖ Tuberculoid leprosy is the one end of spectrum of disease, is seen in high resistance person.
❖ Lepromatous leprosy is the other end of spectrum of disease, seen in low resistance person.
❖ Transplacental Infection doesn't occur
❖ In India, tuberculoid leprosy is more common as compared to Lepromatous Leprosy.

❖ **Cardinal signs of leprosy**:

✓ Skin area with absent or decreased sensation
✓ Thickened nerves and / or tender nerves
✓ Demonstration of M. Leprae in the skin

- ❖ First sensation to go is thermal sensation
- ❖ Most common nerve to be involved is Ulnar nerve, least common is radial nerve.
- ❖ Most commonly Cranial nerves involved are Trigeminal & Facial

Classification of Leprosy: Ridley Jopling classification.
Based on Clinical, Bacteriological, and Immunological & Histological findings:

1. Tuberculoid Leprosy	(TT)	Stable Polar Group
2. Border line Tuberculoid	(BT)	Unstable Group
3. Borderline Borderline	(BB)	Unstable Group
4. Borderline Lepromatous	(BL)	Unstable Group
5. Lepromatous Leprosy	(LL)	Stable Polar Group

Some general facts about leprosy are:

- Cell mediated immune response of the host determine the type of leprosy.
- TT and LL patients are stable
- TT leprosy often self heals, most common type of leprosy in India.
- First clinical symptom in leprosy is numbness.
- LL leprosy remains heavily infected unless given appropriate chemotherapy
- BB leprosy is the most unstable, with most patients down grading if not treated
- Leprosy can affect all ages and both sexes.

- The limited growth of M. leprae in the mouse foot pad provided a way to screen for therapeutic agents and to identify drug resistance in leprosy.
- The recognition of leprosy in the nine banded armadillo provided a source of large quantities of highly purified M. leprae for biochemical and immunologic studies including preparation of vaccine for leprosy.
- Rifampicin was the first drug to be identified as bactericidal for M. leprae and is now the cornerstone of most therapeutic regimens

	TT	BT	BB	BL	LL
Cutaneous Lesions	Hypo pig/ Erythematous macules /plaque well defined margins,regular dry, scaly, Anhidrotic, & partial / complete loss of hair. Sensations are lost almost completely. No. of lesions < 3, thickened or tender nerve to patch.	Hypo pig/ Pinkish macules / plaques well defined with irregular margins, dry, scaly, satellite lesions / Impaired or Complete loss of sweating & Hair. Sensations impaired. No < 10. Feeding Nerves thickened / tender or both.	Cutaneous lesions show characteristics of tuberculoid as well as Lepromatous leprosy. Lesions are bilateral but asymmetrical, numerous but countable, decreased sensation & hair growth. Nerves thickened / tender or both.	Variable morphology tuberculoid or lepromatous, Shiny bilateral macules & plaques tending to be symmetrical. Numerous & uncountable, sensations slightly reduced, hair loss slight, nerves thickened or tender / both	Small, shiny lesions, bilaterally symmetrical, with ill defined margins, macules or plaques, papules, nodules, hypopigmented, sweating normal, numerous uncountable lesions, multiple thickened nerves. Leonine facies, madarosis,keratitis and nasal ulceration.
Immunology (lepromin)	Strongly positive (+++)	Weakly positive (++ or +)	Variable (+ or -)	Negative (-)	Negative (-)
Histopath	Compact granuloma (tuberculoid) hugging or eroding epidermis, Grenz zone is absent, cutaneous nerves destroyed or swollen / caseation.	Tuberculoid granuloma less well formed that TT. Grenz zone present, nerve contains cellular infilterates.	Diffuse epithelioid cell granuloma – Nerve infilterates ; Grenz zone +ve.	Granuloma composed of lymphocytes and macrophages. Nerves show schwann cell proliferation (onion peel appearance, Nerves infiltrated, Grenz zone +ve.	Thinned epidermis & flattened rete ridges diffuse leproma of foamy macrophages with few lymphocytes & plasma cells. Grenz zone +ve, cutaneous nerves preserved.
Bacteriology (slit smear)	No AFB seen	Nil or scanty	Moderate No.	Many	Very many (plus globi)

Indian leprologist classification has other types also:

Indeterminate Leprosy
Pure Neuritic Leprosy
Single skin lesion Leprosy

- **Indeterminate Leprosy**: Usually occurs as one or more hypopigmented,/faintly erythematous macules, commonly on face, buttocks,upper arm and thigh.

- Outer edges – ill defined to well defined margins
- Common in children
- Sensory loss is equivocal
- Most lesions heal spontaneously
- Sometimes thickened nerve palpable
- Mitsuda negative patients are more likely to develop lepromatous leprosy
  Histopathology: Non specific cellular reaction with tendency to surround skin appendages
  Bacteriology: AFB –ve (split skin), nerves show occasional AFB.

Pure neuritic Leprosy:

❖ Form of leprosy with one or more enlarged peripheral nerves, but no skin lesions.
❖ Nerve biopsy necessary for diagnosis
❖ Can be divided into 3 types based on Lepromin test
The deep reflexes are normal in contrast to other peripheral neuropathies

Histoid leprosy

- Unique variant of lepromatous leprosy with better C.M.I.
- Usually seen in patients of incomplete chemotherapy or acquired drug resistance
- Skin lesions – firm,erythematous,round to oval, shiny,succulent nodules, on lower back, buttocks,face and bony prominences.
- Histoid leprosy lesions show the highest loads of bacilli (the bacteriological index is frequently 6 +) and the majority are solid staining,longer, arranged in clumps like sheaves of wheat.
- The histiocyte (macrophage) tissue reaction is unusual in that the cells frequently become spindle shaped and oriented in storiform pattern, similar to those of fibrohistiocytoma
- The presence of these spindle shaped histiocytes in hisopathological section has given this entity the name of 'histoid leprosy'

Lucio Leprosy:

❖ Diffuse non nodular type of leprosy, described in Mexico and latin America. May mimic myxedema
❖ Shiny thickened skin, loss of body hair & facial hair.
❖ Puffy hands, widespread sensory loss, chronic oedema & ulceration of legs
❖ Wide spread sensory loss
❖ Melancholy look – Thickened upper eyelids
❖ Laryngeal involvement – Hoarse voice
❖ Ulceration of Nasal mucosa – Epistaxis
❖ Develops peculiar type of lepra reaction – ***Lucio phenomenon***.

Special Conditions:

Effects of leprosy in pregnant women:

1. Worsening of disease especially in IIIrd trimester & early puerperium because of reduced CMI.
2. Worsening is particularly associated with deterioration of nerve function.
3. Intercurrent infections particularly viral.
4. Increased incidence of Lepra reactions :
   a) Type I reaction especially during first 6 months post partum.
   b) Type II especially in IIIrd trimester & first 6 months of lactation – since physical stress and return to normal of increased ACTH + Cortisol levels.

Reaction occurring in pregnancy is depedent upon type of pre-existing leprosy in patient.

Effects seen in the babies:

1. Babies born to mothers with leprosy weigh less & grow more slowly.
2. High risk of contacting leprosy from mother.

Diagnosis Slit skin smear (SSS)

Consists of obtaining tissue smear from the skin and staining with modified Ziehl-Neelsen stain

- Smear should be taken form six sites: both ear lobes and four representative active skin lesions
- In case of single patch, smear should be taken from two sites diagonally opposite to each other
- A SSS is positive if at least 10^4 bacilli are present per gram of tissue
- Bacteriological index gives a quantitative measure of M. leprae from the skin
- BI falls by 1 unit every year after starting the patient on MDT
- Grading of SSS is based on Ridley's logarithmic scale

Number of bacilli	**Grade**
1 to 10 bacilli in 100 fields	1 +
1 to 10 bacilli in 10 fields	2 +
1 to 10 bacilli in an average field	3 +
10 to 100 bacilli an average field	4 +
100 to 1000 bacilli in an average field	5 +
Clumps and globi in an average field	6 +

- Morphological index is given as the percentage of regularly stained bacteria
- The MI falls to zero by 1 month after starting the patient on multibacillary treatment.

Lepromin Skin Test

Lepromin is prepared form M. leprae and used as skin test antigen

- The two lepromin commonly used are Mitsuda lepromin (commonly armadillo derived) and Dharmendra Lepromin (Human tissue derived)
- Intradermal injection of lepromin evolves into two type of responses, the early (Fernandez) and delayed (Mitsuda) reactions
- Fernandez reaction (within 48 hours) is a delayed hypersensitivity response to bacillary antigen
- Mitsuda reaction (after 4 weeks) is a reliable indicator of cell mediated immunity against lepra bacilli
- Both lepromins produce early and late reaction but Fernandez reaction is prominent with Dharmendra lepromin and Mitsuda reaction is prominent with Mitsuda lepromin
- Lepromin is strongly positive in TT Hansen and gradually decreases across the spectrum and becomes negative in LL Hansen

Complications

Leprosy has been regarded as a dreaded and stigmatizing disease, which can lead to gross disabilities, deformities and mutilations.

- Nerve palsies: due to silent neuritis or reactions-ulcer, claw hand, median nerve palsy, facial palsy, foot drop and claw toes.
- Nerve abscesses, most commonly seen in BT Hansen.
- Anaesthetic complications: trophic ulcer leads to osteomyelitis, distortion of toes and shortening of foot, tarsal disintegration and malignancy.

- Most common cause of death in LL Hansen is renal failure.

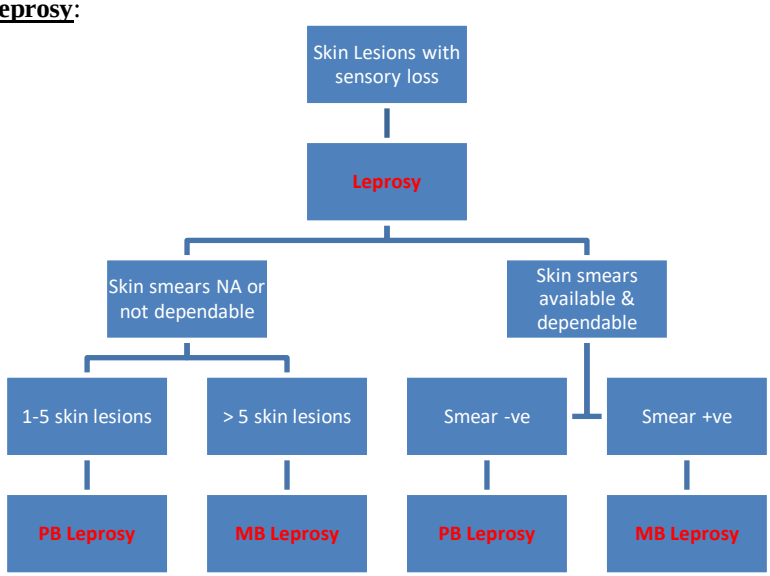
Type of anemia seen in leprosy is dimorphic anemia.

Ocular leprosy

It is an important cause of preventable blindness

- Due to direct leprous involvement: madarosis, conjunctivitis, superficial punctuate keratitis, pannus, corneal ulcer, **iris pearls**, chronic spastic iridocyclitis
  Cause of blindness in LL Hansen is due to iridocyclitis while TT Hansen it is due to exposure keratitis
- Due to type 2 lepra reaction: iritis, iridocyclitis, episcleritis

Treatment of Leprosy:



- ❖ Drug of choice is Dapsone (Diamino Diphenyl Sulphone), a folate antagonist, which is used with Rifampicin & Clofazimine.
- ❖ Rifampicin is bactericidal drug against M. Leprae. Half life is 4 – 5 hrs.
- ❖ Dapsone is a bactreriostatic drug, dose is 1 – 2mg / kg, and its half life is 24hrs.
- ❖ Most frequent adverse effect is hemolysis (G6PD deficient are prone)
- ❖ Dapsone syndrome – After six weeks of therapy, rash, lymphadenopathy, fever
- ❖ Secondary resistance to Dapsone is most common in Lepromatous patients, because of multi step mutation.
- ❖ ***For Paucibacillary*** – Multidrug therapy (PB) for 6 months, tot be completed in 6 months.

- Rifampicin 600mg monthly.
- Dapsone 100mg daily

❖ ***For Multibacillary*** - MDT (MB) for 1 year, to be completed in 12 months.
Rifampicin 600mg monthly supervised
Clofazamine 300mg monthly supervised
Dapsone 100mg daily
Clofazimine 50mg daily

❖ Antileprosy drug should not be stopped during reaction phase or pregnancy

❖Dose of clofazimine is 300 – 350 mg / wt (50mg daily)

Note:- In MB patients with dapsone resistant strains dapsone should be continued in therapy while patients with rifampin resistance, it should be substituted with ofloxacin or minocycline

Newer Drugs :

	Quinolone	Ofloxacin, pefloxacin etc
		Ciprofloxacin is not considered as anti leprotic drug.
	Tetracycline	Minocycline
	Macrolides	Clarithromycin,, Roxithromycin
	Dapsone analogue	
	Clofazimine	
derivatives		
	Ansamycins	Rifamycin, Rifapentine, Rifabutine
	Aminoglycosides	Streptomycin
	Cephalosporins	Cefoxitin, Cephaloridin
	Tyrosine inhibitors	Deoxyfructoserotonin
		Pyrizinamide
		Fucidic acid
	Dihydrofolate reductase	Pyrimethamine
inhibitors		

ROM Therapy: Single dose therapy for single lesion of leprosy, not given now a days.

1. Rifampicin – 600mg
2. Ofloxacin – 400 mg
3. Minocycline – 100mg

Vaccine for Leprosy:

First Generation Vaccines

- BCG Vaccine
- Killed M. Leprae (armadillo)
- Killed M. Leprae + Live BCG

Killed cross reacting M. Leprae & chemically modified M. Leprae (cultivable)

a) M. Welchi
b) ICRC bacillus vaccines
c) M. vaccae
d) M. Leprae – DCC (Mahadevans)

Second Generation Vaccines:

70 KD, 65 KD, 31 kD, 18 KD

Third Generation Vaccines:

Recombinant DNA vaccines

Reaction in leprosy

Reactions are acute episodes of hypersensitivity reactions due to fluctuations in the immune status of a leprosy patient. There are three types of reactions; type 1 reaction, type 2 reaction and Lucio phenomenon

Type I reaction (Reversal)	**Type II reaction (Downgrading)**
a) Tuberculoid group (BT,BB,BL)	a) Lepromatous group (LL ,occasionally in BL)
b) During first six months of treatment	b) Occurs late
c) Change in appearance of lesions	c) No change, new lesions appear mainly nodular lesions (ENL)
d) Systemic symptoms - uncommon	d) Systemic symptoms marked
e) Type IV hypersensitivity reaction	e) Type III, hypersensitivity reaction
f) Steroids – drug of choice	f) Thalidomide – drug of choice

Lucio phenomenon

- Occurs in lucio leprosy due bacterial endotoxins, precipitated by stress and strain
- Characterized by painful, large, bizarre ulceration of skin and is not accompanied by systemic features/

- The lesions occur over legs, thighs and buttock
- Steroids and thalidomides are not effective in the treatment.
- Anti leprosy drugs are the mainstay of therapy.

Parasitic Infestations of Skin:

Scabies; (seven year itch, copra itch)
❖ A pruritic, papular eruptions caused by mite called Sarcoptes Scabies hominis
❖ Incubation period is 3 – 6 weeks, more common in winter.
❖ Common contagious disease, Poor hygiene, over crowding, low socio economic group is predisposing factors.
❖Most common symptom is severe itching worse at night or after hot bath.
❖ Burrow is pathognomic lesion, which is a tunnel made by female mite in stratum corneum to lay eggs. 3 – 15mm
❖ Other lesions are papules, vesicles, excoriation & crusted lesions
❖ Typical sites are – interdigital webs, front of wrist & forearm, axillae, periumblical area, genitalis, medial aspect of fingers, legs & feet
❖ In infants face, scalp, neck, palms & soles may also be involved, burrows are not classically seen

Life Cycle:

- Female mite lays down 2 – 3eggs / day in Stratum Corneum – Eggs hatch to 6 legged larvae (in about 1 week), which finally converts into 8 legged adults (in about 2 weeks). Time taken from egg to adult mite is 2 – 3weeks.

Complications:

❖ Secondary infection, Eczematization, Urticaria, Lymphadenopathy
❖ Id eruption, Glomerulonephritis, Contact dermatitis to topical application

Variants of Scabies

1. Genital scabies (clean man scabies)
2. Scabies incognito – seen in patients wrongly treated with topical steroids.
3. Nodular scabies – (lesion are seen on genitalia)
4. Norwegian Scabies – Seen in Immunocompromised, old & debilitated or malnourished individuals.
5. Extensive crusting & scaling is present with less pruritus

Most severe form of scabies.

Treatment:
1. Drug of choice is 5% Permethrin cream
2. 1% Gamma benzene hexachloride
3. 10% Crotamiton (Children & infants)
4. 25% Benzyl benzoate

All family members should also be treated & clothes + bed linens washed in hot water.
Untreated cases last indefinitely.

Pediculosis :
It is an intense itching condition caused by lice, which is an oval, wingless 6 legged insect, lays down several hundred eggs called Nits. Itching is due to hypersensitivity to saliva injected at the time of biting or louse faeces. Takes 40 days to become an adult from egg.

Pediculosis Types:
(i) Pediculosis Capitis : Caused by pediculus humanis var. capitis
- Most commonly seen in female children.
- Common site is back or side of scalp

(ii) Pediculosis Corporis (Vagabond disease) ❖ Caused by pediculus humanis var. corporis

- ❖ Primary lesion is a small, pruritic, red papule with central punctum.
- ❖ Lice reside on under clothing except when feeding
- ❖ Generalized itching all over body.
- ❖ Pigmentation, excoriation, thickening & depigmented scar occurs.

(iii) Pediculosis Pubis: ❖ (Pthirus Pubis) – Caused by Crab louse

- ❖ Mode of transmission is sexual contact
- ❖ Pruritus of the pubic area may be the only clinical manifestation.
- ❖ **Maculae – cerulae** are bluish or slate coloured macule found at the side of trunk & inner aspect of thigh.
- ❖ Pthirius palpebrum is eyelash involvement due to P. Pubis.
- ❖ Other lice borne disease are Epidemic typhus fever, trench fever, relapsing fever
- ❖ Drug of choice is 1% Permethrin
- ❖ 1% Gamma benzene hexachloride
- ❖ 0 – 5% Malathion

Fungal Infection of Skin:

Fungal infections can be divided into two types:

1. Superficial Fungal Infection (Superficial mycosis)

   (a) Dermatophyte infections

   (b) Yeast infections
   - ❖ P. versicolor
   - ❖ Candidiasis

2. Deep subcutaneous mycotic infections
   - ❖ Mycetoma
   - ❖ Sporotrichosis
   - ❖ Chromomycosis

1. ***Superficial Fungal Infection*** :

Dermatophyte Infections: Dermatophytosis occurs as superficial involvement of stratum corneum Of skin, nail & hair.

Dermatophysis is caused by three genera of Dermatophytes :

1. Microsporum – doesn't involve Nail
2. Trichophyton
3. Epidermophyton – Doesn't involve Hair

Tinea Capitis : Dermatophytic infection of scalp & hair

- ❖ Mainly caused by Trichophyton tonsurans & M. canis
- ❖ Commonly seen in children
- ❖ Can be endothrix & Ectothrix infection
- ❖ Types are:
  1. ***Black dot*** (large sporeEndothrix) caused by T. Tonsurans & T. Violaceum
  2. ***Ectothrix type*** – M. audoni & M. Ferrugineum,M canis (small spore ectothrix)
  3. ***Kerion*** – Most severe pattern of Tinea caused by Zoophilic fungus – T. mentagrophyte

4. ***Favus*** – Caused by T. Schoenleinii, characterized by concave sulfur- yellow crusts around loose,wiry hair, on the glabrous skin cup shaped crusts known as Scutula, 2-3 mm in diameter, embedded in skin. With distinctive mousy odour.

T. barbae – Also known as barber itch, T. sycosis.
Ringworm infection of Beard region & moustache areas of face

T. Faciei – Glabrous skin of Face is involved,lesions are exquisitely photosensitive.

T. Corporis – Dermatophytic infection of body includes upper trunk & limbs

T. Cruris – (Dhobi itch, Jack itch)
Ringworm infection of groin
Common in male adults

T. Unguium - Ringworm of Nail, usually caused by T. rubrum
It involves the nail plate; most common site is Great Toe Nail

Types of T. Unguium:
1. Distal & lateral subungual onychomycosis (DLSO) – Most common
2. Proximal subungual onychomycosis (PSO)-with HIV
3. Superficial white onychomycosis (SWO)
4. Total dystrophic Onychomycosis

Treatment: Griesofulvin, Terbinafine

T. Pedis: (Athlete foot)
- Caused by T. rubrum & T. mentagrophyte mainly
- Involves soles, toes between 4^{th} & 5^{th} toe

T. incognito: Tinea infection treated with steroid modifies the lesion. Less itching

Yeast infections

Pityriasis versicolor:
- ❖ Caused by yeast Malassezia furfur , which is a lipophilic dimorphic fungi
- ❖ Lesions are commonly seen in young adults.
- ❖ Characterized by usually asymptomatic; hypo pigmented or discolored macules or patch covered by furfuraceous scaling, mainly present over the upper trunk
- ❖ Hypo pigmentation is caused by Azaelic acid
- ❖ Lesions are more prevalent in summer season

Diagnosis: Wood & Light Examination
KOH preparation

Treatment:
- Imidazole derivatives & 2.5% Selenium Sulphide
- Ketoconazole

Candidiasis:

- ❖ Caused by Candida albicans, which is yeast like fungus
- ❖ Intertriginous areas commonly involved with edematous red & scaly lesions, whitish Maceration can be seen with satellite lesions.
- ❖ Thrush is Candida infection of mucosa mainly buccal with curdy white patch appearance.
- ❖ Candida can also cause chronic paronychia
- ❖ Perleche is a candida infection of angle of mouth
- ❖ Vulgovaginitis & glossitis can also occur – these are the important manifestations of Candida.

Diagnosis:
- KOH preparation shows pseudohyphae & budding
- ***Culture*** – Sabaroud & dextrose agar

Treatment: Fluconazole**. G.fulvin is not effective.**

Deep Mycosis: Fungal infection of deeper tissue & causes systemic disease

Mycetoma (Maduromycosis, Madura foot)

- ❖ It is the triad of tumefaction, discharging sinuses & bony involvement
- ❖ It is chronic infectious granulomatous condition
- ❖ Two types:- Eumycetoma – Caused by fungi
- ❖ Most commonly caused by pseudallescheria boydii.
- ❖ Others are Madurella mycetoma, Madurella grisea etc

Actinomycetoma: Caused by aerobic actinomycetes Eg: Nocardia

- Actinomadura medurae

❖ Presences of firm to hard subcutaneous nodules are the characteristic lesions, with discharging pus containing grains.

Treatment of Eumycetoma

Surgical excision, rarely can respond to itraconazole,or Amphotencin B & G. fulvin.

Treatment of Actinomycetoma is antibiotics, (Dapsone, Streptomycin) or Cotrimoxazole

Sporotrichosis: Acute or chronic fungal infection caused by sporothrix schenckii. Can be Systemic & cutaneous Cutaneous is characterized by lymphatic cord.
Rx – Itraconazole 200 to 600 mg very effective,fluconazole and ketoconazole can also be tried or = Potassium iodide per orally

Chromomycosis: Chronic fungal infection of skin & subcutaneous tissue caused by pigmented Fungi. Most common is fonsacea pedrosoi . Others are F. compacta, Phialophora verrucosa.

Rx – Itraconazole with & without Flucytosine.,smaller lesions are best treated with surgical excision.

SEXUALLY TRANSMITTED DISEASE

Sexually transmitted disease (STDs) are a group of communicable disease that are transmitted predominantly by sexual contact and caused by a wide range of bacterial, viral, protozoal, fungal pathogens and ectoparasites. A classification of these agents and the disease caused by them are

Pathogen (predominantly by intercourse)	Disease or syndrome
Neisseria gonorrhoea	Gonorrhoea, uretheritis, cervicitis, epididymitis, salpingitis, PID, neonatal conjunctivitis
Treponema pallidum	Syphilis
Haemophilus ducreyi	Chancroid
Chlamydia trachomatis	LGV, uretheritis, proctitis epididymitis, infantile pneumonia, Reiter's syndrome, PID, neonatal conjunctivitis
Calymmatobacterium granulomatis	Donovanosis
Hepatitis B	Acute and chronic hepatitis
Human Papilloma viruses	Genital and oral warts
Herpes simplex virus	Herpes genitalis
Human immunodeficiency virus	AIDS
Molluscum contagiosum	Genital molluscum contagiosum
Candida albicans	Vaginitis
Phthirus pubis	Pediculosis pubis
Trichomonas vaginalis	Vaginitis

Genitoulcerative diseases

Syphilis

- Causative organism – Treponema pallidum, a spirochete, a motile, corkscrew-shaped, gram-negative, prokaryotic bacterium with a flexible, helically coiled cell wall.
- Belongs to the order Spirochaetales ("coiled hair")
- **Transmission:** Direct sexual contact with an infected person in the early stages of the disease (acquired syphilis)

Acquired syphilis: Stages of acquired syphilitic infection

Types	*Incubation period*	*Lesions*
Primary syphilis	9-90 days (average 21 days)	Chancre single or multiple, on skin or mucous membrane, regional lymphadenopathy
Secondary syphilis	6 weeks to 6 months	Multiple secondary lesions (skin or mucous membrane), lymphadenopathy, fever, condylmata lata, alopecia, asymptomatic CNS involvement
Latent syphilis	< 1 year (early) > 1 year (late)	Asymptomatic
Tertiary syphilis	Months to years	Gummatous syphilis (monocytic infiltration, tissue destruction of any organ) Cardiovascular syphilis (Aortic aneurysms) Neurosyphilis (paresis, tabes doraslis, meningovascular syphilis)
Congenital syphilis	3 weeks onwards	Early and late clinical findings

Primary syphilis

- After an incubation period of 9-90 days, infection with treponema pallidum results in a painless chancre (primary chancre, "Hunterian chancre", hard chancre) at the site of inoculation,most common site in male is coronal sulcus and in females fourchete. Five percent of chancers have extra-genital location;ie lips and finger tips.
- Primary chancre is a round or slightly elongated ulcer, 1-2 cm across with an indurated margin. The ulcer has a clear base, without exudates.
- Modest enlargement of inguinal lymph nodes (nontender, nonsuppurative, firm, shorty, "indolent bubo"), frequently bilaterally is observed in the majority of patients.
- Without treatment, the chancre heals with scarring in 3 to 6 weeks
- Relapses of primary syphilis, or chancre redux are rare

Secondary syphilis

- Lesions of secondary syphilis results from the hematogenous dissemination of treponemes during the evolution of the primary sypilitic chancre and lesions appear 3-12 weeks after the initial appearance of primary lesion
- Patients with secondary syphilis may be ill with flu like symptoms that include malaise, appetite loss, fever, headache, stiff neck, lacrimation, myalgias, arthralgias, nasal discharge, and depression
- The skin manifestations of secondary syphilis called syphilids are asymptomatic, polymorphous, variegate, bilateral and symmetrical.
- Initial finding in secondary syphilis is an evanescent macular rash, a few days later symmetric papular eruption appears involving the entire trunk and the extremites, including palms and soles.

- Papular lesions demonstrate **Ollendorf sign**. Even nodules may appear. They may be pustular, but **never vesicular**. Because of the variety of clinical manifestations, syphilis has been called the "**the great imitator**"
- Lesions on mucous membranes appear as raised grey white "mucous patches",known as **snail track ulcer**.
- **Condyloma lata,** the moist, smooth surfaced warty intertriginous plaques are considered to be **most infectious** lesion of syphilis.
- Another hallmark of secondary syphilis is generalized lymphadenopathy, which frequently affect the inguinal, the posterior cervical and the epitrochlear lymph nodes. Their characteristics are similar to that seen in primary syphilis.
- "Moth eaten" alopecia may occur over the scalp
- Rarely, central nervous system, eyes and other visceral organs are affected
- Untreated secondary syphilis spontaneously resolves after a period of 3 to 12 weeks leaving the patient into asymptomatic latent phase
- Individuals may remain asymptomatic for life, even though the T. pallidum organism continues to multiply or enter late symptomatic syphilis

Tertiary syphilis

- **Tertiary syphilis** may be gummatous (nontender pink to dusky red nodules or plaques that vary in size from millimeters to many centimeters in diameter), cardiovascular neurosyphilis

Congenital syphilis

- In congenital syphilis, the treponemes cross the placenta and infect the fetus.
- The fetus is at greatest risk when maternal syphilis is of less than 1 year's duration.
  The ability of the mother to infect the fetus diminishes but never disappears in late latent stages **("Kassowitz's law")**
- Prenatal infection may also result in miscarriage or stillbirths
- Congenital syphilis is divided into early (of less than 1 years duration) and late (more than 1 years duration) congenital syphilis
- The early clinical signs of congenital syphilis begin to appear in the third to eighth week of life and in all cases by 3rd month of life
- Early congenital syphilis is known for snuffles (a persistent discharge syphilitic rhinitis), myriad of cutaneous lesions like secondary syphilis (scaling papules, plaques, bullae, desquamation condylomata lata, mucous patches), Hepatosplenomegaly, generalized lymphadenopathy, **pseudoparalysis of Parrot** (pain from osteochondritis of the long bones or epiphysitis is exacerbated by movement, so the child keeps the affected limb still), saddle nose deformity, notched molars (Moon's molars or Mulbery molars) and central incisors (**Hutchinson's teeth**), rhagades, **clutton's joints (**painless swelling of joints – most commonly both knee**), sabre tibia**, palatal perforation, neurosyphilis (tabes dorsalis, general paresis and local gummata) and paroxysmal cold hemoglobinuria

Diagnosis

Acquired syphilis

- The dark field examination is actually the best test that specifically establishes the diagnosis of primary syphilis.
- The non-specific treponemal tests the Venereal Disease Research Laboratory (VDRL) and the rapid plasma regain (RPR), typically become reactive within 4 to 7 days of chancre development. A titre of 1.8 or more is said to be significant. These titre results correspond with disease activity and should reduce four fold within 6 to 12 months of treatment and become undetectable several years there after. False positive results may occur with numerous conditions, such as collagen vascular diseases, several chronic infections such as HIV or tuberculosis, advancing age, narcotic drug use, chronic liver disease and several active infections such as herpes

- Because of the decreased specificity of above tests, positive results be confirmed with the more precise treponemal tests, treponema pallidum heme agglutination assay (TPHA), microhaemagglutination assay for T pallidum (MHA – TP) and fluorescent trepnemal antibody absorptions test (FTA – ABS). CSF examination and chest X-ray should be done in tertiary syphilis. Sometimes, skin biopsy may be required to show characteristic histopathological changes (Endarteritis obliterans and predominantly perivascular infiltrate of lymphoid cell and plasma cells are basic pathologic changes of syphilis. Late in the course of syphilis, granulomatous changes also occur) and organisms in tissue can be demonstrated by silver staining.

Congenital Syphilis

- A diagnosis of congenital syphilis can be made with confidence if the mother has reactive non-treponemal and treponemal serologies and the infant manifests classic signs of disease
- Congenital syphilis is also highly likely when the infant's non-treponemal antibody titre is four fold or greater than the mother's serum, even in the absence of physical findings
- IgM FTA – ABS test is specific for congenital syphilis, particularly if the titre rises.

Treatment

Acquired syphilis

Stage	Treatment	Follow up
Primary, secondary, or early latent syphilis	2.4 million IU intramuscular benzathine penicillin G once	Clinical and serologic exams at 3,6,9,12 and 24 months
Late latent syphilis or syphilis of unknown duration	2.4 million IU intramuscular benzathine penicillin G weekly for 3 weeks	Clinical and serologic exams at 6,12,18 and 24 months
Neurosyphilis or ocular syphilis	3-4 million IU of intravenous aqueous crystalline penicilline G every 4 hours for 10-14 days or intramuscular procaine penicillin 2.4 million IU daily and oral probenecid 500 mg 4 times per day for 10-14 days	If CSF pleocytosis was initially present, CSF exams every 6 months for upto 2 years of until this parameter returns to normal

If patient is allergic to penicillin in early syphilis, he/she may be treated with

- Doxycycline 100 mg bd PO x 14 days or
- Tetracycline HCL 500 mg qid PO x 14 days
- Patients of early syphilis and late syphilis should be followed up clinically and serologically at 3 monthly intervals

Congenital Syphilis

- **Early congenital syphilis**
- Crystalline penicillin 50,000 units/kg body weight in 2 divided doses x 10 days
- **Late congenital syphilis**
- Crystalline penicillin 50,000 units/kg body weight for 10 to 14 days

Chancroid (Soft sore, soft chancre, ulcus molle)

- Three days to 2 weeks (1-5 days usually) after exposure to Haemophilus ducreyi (gram-negative bacillus), a small inflammatory papule or pustule arises at the site of inoculation
- Within days, the lesion erodes to form an extremely painful, deep ulceration.
- The characteristic ulcer is soft, friable and non-indurated, with ragged undermined margins, a foul smelling, yellow-grey exudates covering and surrounding erythema
- Within 1 to 2 weeks, painful inguinal lymphadenitis ("inflammatory bubo") most often unilateral develops in 30% to 60% of patients (about half the cases). Twenty five percent of patients have progression of the

lymphadenitis into a suppurative bubo (unilocular abscess), which may spontaneously rupture and develop ulceration

Diagnosis

- H. ducreyi may be identified in the form of chains ("school of fish") of gram-negative cocobacilli in the smear from the ulcer, or preferably of pus form bubo.
- Ideally it should be cultured on one of the modern selective media at 33^0C in an atmosphere of high humidity ,PCR can also be done.
- Ito – Reenstierna test – intradermal test with a vaccine containing killed H. ducreyi in suspension, producing an inflammatory papule (0.5 to 1 cm in diameter) after 48 hours
- Because of the current difficulty with diagnosis, the CDC recommends that a probable diagnosis can be determined by the presence of the following: one or more painful genital ulcers a clinical presentation and associated lymphadenopathy, a negative laboratory evaluation for T. pallidum (serologic testing or dark field examination) and a negative testing for herpes simplex virus (HSV)

Treatment

- Center for Disesae Control and Prevention (CDC) in 2007 recommends
- Azithromycin 1 g orally in a single dose, or Ceftriaxone 250 mg intramuscularly (IM) in a single dose, or Ciprofloxacin 500 mg orally twice a day for 3 days (contraindicated) for pregnant and lactating women), or Erythromycin in base 500 mg orally three times a day for 7 days.

Lymphogranuloma venereum (LGV)

- Causative organism – Chlamydia trachomatis immunotypes L1, L2, and L3
- The course of disease in LGV consists of 3 separate stages
- After an incubation of 3-30 days after inoculation, the first stage begins with a small painless papule or pustule that may erode to form an asymptomatic herpetiform ulcer. This typically heals without scarring in 1 week and often goes unnoticed
- The second stage begins within 2-6 weeks after the onset of primary lesion. It is referred to as inguinal stage and consists of painful inflammation and infection of inguinal and/or femoral lymph nodes. Involvement is limited to one groin in about two third of the cases. Enlargement of tender lymph nodes above and below the inguinal ligament may give the bubo a grooved appearance the "sign of the groove". Suppuration occurs in them with the formation of multiple small abscesses. These abscesses open on the skin surface to form multiple sinuses, finally healing with puckered scars. Constitutional symptoms are very variable.
- The third stage is called as genitorectal syndrome. The interval between the early stage and later manifestations may vary from a year or two to many years. Patients may develop genital elephantiasis (Esthiomene) or anorectal syndrome. It more often develops in women and homosexual men who engage in receptive anal intercourse and includes proctocolitis, peri-rectal abscess, fistula

Diagnosis

- A definitive diagnostic can be achieved with isolation of the organism on culture and cell typing of the isolates
- Direct microscopy for intracytoplasmic elementary bodies.
- The Frei test- an intradermal test with 0.1 ml of Lygranum antigen, read at 48 to 72 hours – a raised, red purple, at least 6 mm across
- With appropriate clinical presentation, a complement fixation antibody titre of greater than 1:64 is considered diagnostic of LGV, DFA can also be done.

Treatment

Centre for Disease Control and Prevention (CDC) in 2007 recommends
Doxycycline 100 mg orally a day for 21 days. Alternative treatment is erythromycin base 500 mg orally four times a day for 21 days

Granuloma inguinale (Donovanosis)

- Causative organism – Calymmatobacterium (Donovania) granulomatis, related to the Klebsiella species, gram negative, obligate intracellular bacillus

- After an incubation period of 8 days to 12 weeks (an average of 17 days), single or multiple subcutaneous nodules or papules develop at the site of inoculation (genitalia, thigh, groin, or in the perineum). These enlarge and erode form painless, soft, beefy, red, exuberant ulceration with clean friable bases and distinct raised rolled margins
- The clinical presentation can also include hypertrophic, necrotic, or sclerotic variants
- Inguinal enlargement may occur because of subcutaneous granuloms that arise superficially in the area of the inguinal nodes called pseudobuboes (not lymphadenitis)

Diagnosis

- The most reliable method of diagnosis involves direct visulazation of the bipolar staining intracytoplasmic inclusion bodies. These "safety pin-shaped bodies" also called as "Donovan bodies" can be seen within histiocytes (vacuolated monocytes) of granuloation tissue smears or biopsy specimens. Wright's or Giemsa stains are both satisfactorily used
- Biopsy and histopathological examination

Treatment

1. Cotrimoxazole 2 tables twice daily for 10 days
2. Tetracycline 500 mg 6 hourly for 14 days
3. Doxycycline 100 mg BD for 14 days
4. Injection of streptomycin 1 gram given daily for 14 days

Centre for Disease control and Prevention (CDC) in 2007 recommends

Doxycycline 100 mg orally twice day for at least 3 weeks

Or Trimethoprim – sulfamethoxazole one double – strength (800 mg/160 mg) tablet orally twice a day for at least 3 weeks

Herpes Genitalis

- Both HSV – 1 and HSV –2 produce primary as well as recurrent genital infections. Isolation of HSV – 2 can be successful in 80% of instances
- HSV is the most common cause of genital ulceration and accounts for 20% to 50% of ulcerative lesions in patients attending sexually transmitted disease clinics (STD clinics)
- The incubation period for both HSV –1 and HSV – 2 is between 3 to 14 days
- The outbreak begins with small grouped vesicles, which break and progress to ulcerative lesions in 2 to 14 days
- The first episode of genital herpes usually has multiple lesions, which present bilaterally and coalesce to involve a larger surface. Painful inguinal lymphadenopathy is common. The dominant local symptoms of primary genital herpes are pain, itching, Dysuria, and vaginal and urethral discharge. The ulcers of herpes genitalis are superficial and tiny. The severity of these symptoms increases for the first 6-7 days of the illness and peaks during the first week of illness in about 75% of patients. The course of primary genital herpes may last for 18-21 days and the virus shedding is present for about 11 days following the primary infection.
- About 50% of males will have a recurrence in 4 months but the severity of symptoms, and duration of viral shedding are much shorter in recurrent episodes than in primary disease

Diagnosis

- Definitive diagnosis of genital herpes is made by viral culture of the lesions, which can distinguish between HSV –1 and HSV – 2
- Biopsy and cytological studies useful in the diagnosis, but unable to differentiate between HSV – 1, HSV –2 and varicella zoster virus
- The use of specific monoclonal antibodies directed against HSV –1 and HSV – 2 proteins have proved to be sensitive and specific
- PCR can be used to detect HSV DNA
- Valuable bedside clinical test is **Tzanck test**
- **Treatment**

Centre for Disease Control and Prevention (CDC) in 2007 recommends

First clinical episodes of genital herpes

Acyclovir – 400 mg orally three times a day for 7-10 days, or Acyclovir 200 mg orally five times a day for 7-10 days, or Famciclovir 250 mg orally three times a day for 7-10 five times a days, or Valacyclovir 1 g orally twice for 7-10 days.

Recurrent episodes of HSV disease

- Acyclovir 400 mg orally three times a day for 5 days or, Acyclovir 200 mg orally five times a day for 5 days, or Acyclovir 800 mg orally a day for 5 days, or Famicicolovir 125 mg orally twice for 5 days, or Valacyclovir 500 mg orally a day for 3-5 days, or Valacyclovir 1.0 g orally once a day for 5 days

Suppressive therapy, for recurrent genital herpes

Acyclovir 400 mg orally twice day, or Famciclovir 250 mg orally twice a day, or Valacyclovir 500 mg orally a day, or Valacyclovir 1.0 gram orally once a day.

Periodically, once a year discontinuation of suppressive therapy should be discussed

URETHRITIS, CERVICITIS AND/OR VAGINITIS

GONORRHEA

- The term, gonorrhea is derived from Greek "flow of seed"
- Causative organism – Neisseria gonorrhoeae, a gram – negative,nonsporing diplococcus that is found in pairs (diplococci) within polymphonuclear leukocytes in purulent material
- Infects noncornified epithelium most often longer (on an average 2-5 days) .
- Strains are por1B, while for disseminated gonococcemia por1A.
- Acute anterior uretheritis is the most common manifestation of gonococcal infection in men and as any asymptomatic or minimally symptomatic endocervical colonization in women
- Predominant symptoms are mucoid or mucopurulent urethral discharge or Dysuria. On examination, mucoid or mucopurulent discharge is seen from the uretrhal meatus and the meatus is erythematous and oedematous. Epididymitis, semital vesiculitis and prostatitis may occur but usually much later.
- In females, if manifest, it leads to increased vaginal discharge, Dysuria, intermenstural bleeding or menorrhagia. Examinatoin reveals mucopurulent cervical discharge, the cervix has erythema and oedema, swabbing the endocervix easily induces mucosal bleeding. Salpingitis and Bartholin gland abscesses are possible local complications. Ascending infection and bacteremic dissemination (disseminated gonococcal infection) are responsible for most of the serious morbidity
- Rectal mucosa is a frequent site of infection in homosexual men with symptoms ranging from minimal Pruritus, painless mucopurulent discharge or scant rectal bleeding to overt proctitis
- Pharyngeal infection occurs in 3-7 percent heterosexual men, 10 to 20 percent of heterosexual women, and 10 to 25 percent homosexually active men
- Ophthalmia neonatorum may occur due to perinatal transmission

Diagnosis

- Isolation of N. gonorrhoeae is the diagnostic standard for gonococcal infections
- Urethral smear is sufficiently sensitive and specific, that the culture may be considered optional for routine care. Gram's stain has been the most extensively studied. A diagnosis of uretheritis is made if there are more than 5 pus cells present per oil emersion field. In addition, these pus cells have intracellular gram-negative diplococci, confirming diagnosis of gonorrhoea

Treatment

For uncomplicated gonococcal infections of the cervix, urethra, and rectum, Centre for Disease Control and Prevention (CDC) in 2007 recommends

Cefixime 400 mg orally single dose, or **Ceftriaxone 125 mg IM in single dose**, or Ciprofloxacin 500 mg orally in a single dose, plus IF CHLAMYDIAL INFECTION IS NOT RULED OUT Azithromycin 1 g orally in a single dose or Doxycycline 100 mg orally twice a day for 7 days.

Alternative treatment

1. Spectinomycin 2 gm I/M single dose
2. Ampilcillin 3 gm amoxicillin 3.5 gm with 1 gm probenecid

Non – gonococcal uretheritis (NGU)

- NGU is diagnosed if gram – negative intracellular organisms cannot be identified in the discharge on gram stain in a patient with urethral discharge and burning micturition
- Chlamydia trachomatis is responsible for 30 to 50%, Ureaplasma urealyticum for 10 to 40% and the rest are due to Trichomonas vaginalis, yeasts, Herpes simplex virus, Adenovirus, Hemophilus sp., Bacteriodes etc.
- The incubation period is 1 to 5 weeks
- In males, uretheritis begins with Dysuria and mucoid urethral discharge. In contrast to gonococcal uretheritis, symptoms are usually mild. Most cases in females are asymptomatic

Diagnostic

1. **Gram's stained urethral discharge** shows more than 5 pus cells per oil emersion field but no gram-negative intracellular diplococci are seen
2. **Culture**: Urethral swabs are sent for N. gonorrhoeae, mycoplasma, and anaerobes culture. Chlamydial antigen detection may be done on swab.

Treatment:

1. Cap. Tetracycline 500 mg qid for 7 days
2. Cap. Doxycycline 100 mg bid for 7 days
3. T.Erythromycin 500 mg qid for 7 days

Center Diseease Control and Prevention (CDC) in 2007 recommends

Azithromycin 1 gm PO once or
Doxycycline 100 mg PO BD for 7 days

Alternative regimens

Erythromycin in base 500 mg PO qid for 7 days or
Ofloxacin 300 mg PO BD for 7 days or Levofloxicin 500 mg orally for 7 days

Pelvic inflammatory disease (PID)

PID comprises of a spectrum of inflammatory disorders of the female upper genital tract, including any combination of endometritis, salpingitis, tubo-ovarian abscess and pelvic peritonitis. It may be of the chronic (caused by M. tuberculosis) or acute PID (caused by sexual pathogens). This section will be dealing with acute PID

- Cervical pathogens: N. gonorrhoeae, Chlamydia trachomatis
- Vaginal microorganisms: Anaerobic bacteria (e.g. Prevotella, Peptostreptococcus), H influenzae, Gardnerella vaginalis, Mycoplasma hominis, and Ureaplasma urealyticum

Symptoms and signs

Wide variations is symptoms in women depending on the pathogen and the site of pathology

- Malodorous, yellowish vaginal discharge
- Midline abdominal pain, abnormal vaginal bleeding (due to endometritis)
- Dyspareunia
- Lower abdominal and pelvic pain (salpingitis)
- Fever, nausea vomiting, abdominal tenderness and rigidity (due to peritonitis).

(****Fitz-Hugh-Curtis** syndrome refers to perihepatitis with acute PID caused by gonococcus or chlamydia. Patient presents with pleuritic upper abdominal pain and violin-string adhesions over the liver seen on laparoscopy)

Diagnostic criteria

Minimum criteria

- Uterine / adnexal tenderness
- Cervical motion tenderness

Additional criteria

- Oral temperature > 101^0 F
- Abnormal cervical or vaginal discharge
- WBC's on saline mount of vaginal discharge
- Elevated ESR and C – reactive protein
- Laboratory documentation of cervical infection with *N. gonorrheae or C trachomatis*

Specific criteria (required only in certain cases)

- Endometrial biopsy showing in certain cases

- Transvaginal sonography or MRI scan showing tubal abnormalities or tubovarial abscess
- Laparoscopic findings of PID

Treatment

- Treatment should be initiated with minimal criteria and needs to cover all the etiological pathogens. Early treatment prevents sequelae
- Parenteral therapy is given for the initial 24-48 hours and there after oral therapy is continued

Regimen include –
IV Cefoxitin plus oral doxycycline (after 24 hours IV drugs stopped and oral doxycline continued) or IV clindmycin and gentamicin (24 hours) follwed by oral doxycycline or IV ofloxacin with metronidazole or IV ampicillin plus doxycycline

- May sexual contacts (in the preceding 60 days) should be treated

BACTERIAL VAGINOSIS

(Leukorrhea; Haemophilus vaginalis vaginiti; Gardnerella vaginialis vaginitis; anaerobic vaginosis; vaginal bacteriosis)

- Bacterial vaginosis (BV) is a common cause of abnormal vaginal discharge in women of reproductive age
- It represents a complex change in vaginal flora characterized by a reduction in the prevalence and concentration of hydrogen peroxide producing lactobacilli and increase in the prevalence and concentration of Gardnerella vaginalis; Mobiluncus species; Mycoplasma hominis; anaerobic gram-negative rods belonging to the general Prevotella, Porphyromonas, and bacteriodes; and Peptostreptococcus species
- Amsel etal has proposed a set of practical diagnostic criteria for the clinical diagnosis of BV that is now often accepted as the "gold standard." Diagnosis requires three or more of the following clinical/diagnostic features
  - The presence of (excessive) homogeneous vaginal discharge
  - Elevated vaginal pH > 4.5
  - Positive amine test (Whiff test)
  - 20% "clue cells" (vaginal epithelial cells adhered to by infective microbes) and typical Gram stain appearance upon microscopy of vaginal secretions including absence of lactobacilli

Treatment

- All women who have symptomatic BV disease require treatment
- Metronidazole 500 mg orally twice a day for 7 days, or Metronidazole gel 0.75% one full applicator (5 g) intravaginally, onse a day for 5 days, or Clindamycin cream 2%, one applicator inuavagualy at pequine 4 days are recommended treatments
- Alternatively, patient may be treated with **Metronidazole 2 g orally in a single dose**, Clindamycin 300 mg orally twice a day for 7 days, or Clindamycin ovules 100 g intravaginally once at bedtime for 3 days

STD	**Syphilis**	**Chancroid**	**LGV**	**GI**	**Herpes Genital**	**Genital Wart**
Organism	Treponema Pallidum	Haemo Philus Ducreyi	Chlamydia Tracho Matis L1 L2 L3	Calymmatob acterium Granulo matis	HSV - II	HPV 6, 11, 16, 18, 30
C/F **I.P.**	9 – 90 days	2 – 7 days	3 – 30 days	8 – 80 days	3 – 12 days	Few weeks – months
Morpholog y	Single non tender, indurated, clean ulcer	Multiple, tender, non indurated, ulcer with under mined edges	Transient Herpetiform vesicular	Single, beefy non indurated, non tender, granulo-matous, bleeds on	Multiple grouped superficial	Multiple verruceous papillo matous

				touch		
Inguinal LN	Rubbery discrete, mobile, non tender	Inguinal bubo unilateral unilocular tender	Inguinal bubo, tender multilocular, tender, 'Sign of groove' 50%	-	Tender LAP	-
Lab Diagnosis	Dark ground, Serology, VDRL, TPi, FTAbs, TPhA	Grams -ve School of Fish	Immuno Fluore scence	Donovan bodies in mononuclear cells in Giemsa stain	Tzanck Smear, Viral culture	Clinical PCR
Treatment	Injection Benzathine Penicillin	I/m Ceftriaxone 250mg	Doxy	Doxy	Acyclovir 200mg five – times 5 – 7 days	25% Podophyllin

Chapter-3

SCALING DISORDERS OF SKIN

Erythosquamous Diseases

Psoriasis:

- One of the Common dermatological disease, affecting 1 – 2% of population worldwide.
- Chronic relapsing inflammatory disorder of skin characterized by Erythematous , sharply demarcated papules & plaques , covered by silvery micaceous scales.
- Lesions tend to be variably pruritic
- Commonly involved areas are the extensor surfaces of elbows & knees, gluteal cleft & the scalp..
- Lesions tend to be symmetric.
- Traumatized areas are often involved (Koebner or isomorphic phenomenon), Auspitz sign is positive

Etiopathogenesis;

- No causative agent has been found to cause psoriasis
- Genetic factors are important with multifactorial inheritance
- Almost 5% of first degree relative also have psoriasis
- HLA CW_6 has been strongly associated with psoriasis has a increased risk up to 15 times.
- Other HLA – B_{13}, B_{16} & B_{17} are associated with high risk
- HLA B_{27} in 70% individuals who develop arthropathy with Psoriasis

Precipitating Factors:

- Infections – Beta haemolytic Streptococci, caused sore throat can precipitate (Guttate Psoriasis) in children.
- Candida infections,HIV,staph infections
- Stress
- Mechanical trauma
- Drugs – alcohol intake, Lithium chloride, Beta blockers, NSAID, Iodides, Antimalarials, heavy metals.

***Types of Psoriasis*:**

Morphological variants:

a) Chronic plaque psoriasis
b) Guttate psoriasis
c) Pustular psoriasis

d) Erythrodermic psoriasis

Variants according to Sites involved:

a) Palmo-Plantar Psoriasis
b) Inverse Psoriasis (flexural)
c) Scalp Psoriasis
d) Nail Psoriasis
e) Psoriatic arthritis (5-7%)

Nail changes in Psoriasis: 25 – 50% of patients have characteristic nail changes

(i) Pitting
(ii) Nail discoloration
(iii) Sub ungual hypetrkeratosis
(iv) Nail dystrophy,ridging,grooving of nail plate
(v) Onycholysis
(vi) Oil drop sign (pathognomic)

Diagnosis:

(i) Characteristics clinical features
(ii) (ii) Skin biopsy

Histopathology: Hyperkeratosis, Elongation of rete ridges,supra papillary thinning, loss of granular layer,
intraepidermal Collection of Neutrophills, Dilated capillaries & mononuclear cell
infilterates in Dermal papillae.
.

Treatment: Depends on the type, location & extent of disease

Drugs:

(i) Topical glucocorticoids
(ii) Crude coal tar
(iii) Goeckerman regimen (UVL +Coal tar)
(iv) Topical VitD3 analog – Calcipotriene,tacalcitol,maxacalcitol
(v) Ingram regimen (UVL + Anthralin)
(vi) PUVA therapy
(vii) Methotrexate , Cyclosporine and mycophenolate mofetil
(viii) Retinoids
(ix) tacrolimus (FK-506)

(x) biologic agents (infliximab, alefacept, etanercept)

(xi) lasers

Indications of Methotrexate therapy:

1. Psoriatic Erythroderma
2. Psoriatic arthritis
3. Chronic stable plaque psoriasis, not responding to conventional therapy

Lichen Planus :

- It is a papulosquamous disorder characterized by Pruritis polygonal, purple, plain topped papules & plaques and may be pterygium also.
- Etiology is unknown, may be associated with hepatitis C viral infection, or HBV vaccination, autoimmuno reaction eg GVHD,thymomas,myasthenia gravis
- **drugs** associated are gold, heavy metals,penicillamine,antimalarials,ATT,thazides,tetracycline
- The skin lesions are most commonly present over the wrists, shins, lower back & genitalia
- Wickham's striae is a network of greyish lines which is characteristic of LP
- Mucosal membrane is commonly involved 30 – 70%, most common Buccal mucosa & tongue
- Mucosal lesions are white lacy reticular eruptions
- Koebners phenomenon is characteristic of Lichen Planus.
- Involvement of Hair follicle is known as ***Lichen Plano Pilaris***, may lead to ***Cicatricial alopecia*** of scalp.
- ***Nail changes occurs in 10% of Patients***:
- Pterygium formation
- Longitudinal ridging
- Onychomedesis
- Splitting of nail plate
- Onychodystrophy (including 20 nail dystrophy)

Other variants of LP

Linear,annular, atrophic, hypertrophic,follicular,vesiculo-bullous.

Diagnosis:

(a) Characteristic clinical features

(b) Skin Bx – Reveals hyperkeratosis, Hypergranulosis, Irregular acanthosis, Band like infilterate of lymphocytes at Dermoepidermal junction, Basal cell degeneration, ***Colloid or Civatte*** bodies are present in upper dermis.

Treatment :

- Spontaneous remission
- Topical glucocorticoids are the mainstay of therapy
- Acute LP systemic steroids
- Systemic antihistaminics

- Oral Dapsone for oral LP & acute generalized LP
- Topical soothing agents
- Vitamin A derivative

Lichen Nitidus :

- Lesions and etiology are similar to LP, but size is smaller 1.2 mm (Pinhead size)
- Occurs as grouped lesions over elbows, abdomen, penis, dorsa of hands
- Mucosal or nail changes are rare
- Eruption is chronic but asymptomatic,Self limiting, resolving spontaneously over months or yrs.

Histopathology :

- Ball in clutch appearance

Treatment :

- Antihistamines – particularly Astemazole is effective
- Mild topical steroids

Lichen Actinicus : Lichen Sub tropicus

- Lesions occur on the exposed skin (usually face) & are characterised by well defined
  - Nummular patches, with deeply hyperpigmented centre surrounded by hypopigmented zone
- Role of Sunlight in pathogenesis of LP actinicus

Treatment : - Topical steroids, Sun screen

Pityriasis rosea :

- It is a papulosquamous disorder mainly seen in children, adults may be affected.
- Occurs more commonly in spring and fall.

- ***Etiology***: Unknown? Viral Human Herpes Virus – 7

- ***C/F***: After a week of mild systemic symptoms (? Viral)
  - An annular lesion (2 – 6mm) with fine scaling (fine cigarette paper like), collarette of scales.
  - followed by many smaller annular or papular lesions with trunchal predilection
  - (Christmas tree pattern)

D/d Drug eruption, sec. syphilis, p. versicolor or guttate psoriasis.,tinea corporis.

Inverse P. rosea : Involves limbs, spares, trunk

Treatment:-

- Self limiting in 6 – 8 weeks
- No treatment required
- Sever cases UVB phototherapy can be tried.

KERATINIZATION DISORDERS

- **Ichthyosis**
  Ichthyosis (from Greek ichthys "fish") denotes a group of hereditary and acquired disorders characterized by excessive scaling.

Hereditary (inherited) ichthyoses:

Ichthyosis vulgaris:. Most common type of inherited icthyosis, autosomal dominant.
Increased palmar marking or frank palmoplantar keratoderma may be associated features.
Onset is after 3 months of age.
The scale is white or grey, small, branny and semi adherent with turned up edges, more pronounced on extensor surfaces of arms and lower legs, characteristically sparing the flexural creases. May clear in summer months
Granular layer is diminished or absent in epidermis
Histidine is reduced, precursor of filaggrin, which is major component of keratohyaline granules

- **X-linked recessive ichthyosis:** It appears in infancy and occurs in males. Females may be heterozygotes and female carriers are either totally spared or only mildly affected. Large dirty brown scales characterize it. Extensor and flexor aspects of the limbs are involved but spare rhomboidal spaces in body folds. Palms and soles are spared but the neck, side of the face and trunk are affected. This form of ichthyosis is associated with steroid sulphatase deficiency.

Lamellar ichthyosis: Lamellar ichthyosis is a rare form of ichthyosis, which presents at birth as "Collodion baby"; baby is encased in a taut inelastic membrane. In this autosomal recessive disorder, the baby later develops **large, thick plate like scales all over the body including flexures.** Facial involvement often results in ectropion and eclabium, also known as 'Aligator boy'**.** Enzyme transglutaminase is deficient

1. **Refsum's syndrome (heredopathia atactica polyneuritiformis)**
   - Refsum's syndrome is a rare autosomal recessive metabolic disorder in which there are characteristic neurological and cutaneous clinical features.
   - The underlying abnormality is deficiency of enzyme phytanic acid oxidase.
   - As a consequence of this deficiency, phytanic acid (found in green vegetables) accumulates and displaces some of the unsaturated fatty acids, such as linolenic acid, from the lipids through out the tissues.
   - It manifests usually in the second decade.
   - Skin is affected by an ichthyosis very similar to ichthyosis vulgaris
   - **Neurological changes include a cerebellar degenerative disorder (cerebellar ataxia), a progressive polyneuropathy, retinitis pigmentosa, and a sensory deafiness.** Rarely, cardiac abnormalities have been described.
   - Diagnosis-Histopathology of the skin shows some of the epidermal cell containing lipid vacuoles. No or very little phytanic acid is present in the blood.
   - Treatment by a phytanic acid free diet, in which green vegetables and dairy products are excluded, has been used

Acquired ichthyoses

The distinction between dry skin (xerosis) from environmental causes and acquired ichthyosis is sometimes difficult. The sudden onset of generalized pronounced ichthyoses in an adult could be due to:-

1. Lymphomas especially Hodgkin's lymphoma
2. Internal malignancy
3. Malabsorption syndromes and malnutrition
4. Certain drugs like clofazimine,nicotinic acid
5. Hypothyroidism
6. Lepromatous leprosy
7. HIV disease

Treatment

- Emollients for scaly skin
- Salicylic acid, urea, lactic acid in ointment form for topical application
- Oral retinoids- Etretinate or Acitretin. They are really useful in lamellar and congenital ichthyosiform erythrodermas.

Pityriasis rubra pilaris

- Disease of unknown cause, characterized by epidermal overactivity.
- **c/f** follicular keratosis,palmoplantar keratoderma and erythroderma.
- Initially scaling of the face and scalp,which resembles seborrheic dermatitis.
- Salmon colored follicular conical papules coalesce into patches and plaques over the trunk and extremitits.
- Presence of islands of uninvolved skin, sandel colored thickening of palm and sole.

Histopathology- follicular hyperkeratosis with perivascular inflammation

Treatment – Retinoids are the mainstay of the treatment, steroids and methotrexate.

Darier's disease

- It is disorder of keratinization with an autosomal dominant mode of inheritance (Chromosome 12)
- Onset is during puberty when **dirty, warty, greasy papules appear in the seborrheic distribution** .
- In due course of time, the lesions grow in size and form malodorous, papillomatous and vegetative growth.
- Other features include palmar pits and 'V' shaped nicking of nails
- Oral cavity shows cobble stone appearance of the mucosa
- Exacerbation occurs following sun exposure
- Histopathology shows dyskeratosis (corps ronds and grains) and acantholysis.
- Topical and systemic retinoids are the drug of choice

Palmoplantar keratoderma (PPK)

- Palmoplantar keratoderma means thickening of palms and soles. These can be inherited as well as acquired. Inherited PPK can be classified based on the presence or absence of transgradiens (spreading of keratoderma on to the extensor surface)
- Transgradiens is seen in Mal de Meleda, Vohwinkel's Greither's and Papillon-Lefevre syndrome
- Transgradiens is not seen in Thost-Unna (most common diffuse palmoplantar keratoderma), Vorner (diffuse PPK with epidermolytic hyperkeratosis) and focal types.
- The important features of various inherited PPK are given in the following table

Type of Keratoderma	**Important features**
Thost- Unna (AD)	Diffuse PPK with livid red border Marked hyperhidrosis
Vorner type (AD)	Diffuse PPK similar to Thost-Unna type. Histology shows epidermolytic hyperkeratosis
Vohwinkel's type (AD)	Honey combed palmoplantar thickening with constriction bands and mutilation. Star fish shaped keratosis on dorsa of hands and fingers.
Mal de Meleda (AR)	Palmoplantar keratoderma in a glove like distrbution. Erythema is prominent with hyperhidrosis and malodor
Greither (AD)	Diffuse PPK that is progressive. Extensor surfaces of hands, knees and elbows shows psoriasiform plaque.
Olmsted syndrome (S)	Congenital PPK with perioral hyperkeratkosis spontaneous amputation can occur
Papillon-Lefevre (AR)	PPK associated with periodontosis and increased frequency of pyogenic infection

Note: AD- Autosomal dominant, AR- Autosomal recessive, S- Sporadic occurrence

- Various causes of acquired keratoderma are pityriasis rubra pilaris, malignancy (Tylosis), myxedema, Darier's disease, keratoderma climactericum, psoriasis, lichen planus, and tinea pedis.

Acanthosis nigricans

Acanthosis nigricans is a nonspecific reaction pattern involving major body folds and mucocutaneous regions characterized by hyperpigmented, velvety, soft, verrucous lesions in a symmetric fashion.

- It is broadly divided into benign and malignant form.
- Benign acanthosis nigricans involyes limited body areas and is less severe than malignant forms.
- The various benign forms that are the most common include benign familial acanthosis nigricans, acanthosis nigricans associated with various syndromes, endocrine disease (especially insulin resistance diabetes mellitus), obesity (pseudoacanthosis nigricans) and drugs (Nicotinic acidic, fusidic acid, stillbestrol, oral contraceptives).
- Malignant acanthosis nigricans is associated with extensive, widespread lesions and mucosal involvement. They may precede, follow or occur simultaneously with onset of

malignancy. Thickening of palms, especially fingertips produces accentuated dermatoglyphics with deep sulci called as Tripe palms.

- Gastric carcinoma is the most commonly associated tumour; other sites include the bronchus, pancreas; ovary; bile duct, gall bladder, endometrium, breast and thyroid.
- Treatment: As it is a reaction pattern to some of the underlying conditions, treatment need to be directed at them. Generally, local treatment serves no purpose.

Chapter 4

ECZEMATOUS DISORDERS OF THE SKIN

Eczema & Dermatitis:

- Eczema is a reaction pattern of inflammatory response of the skin characterized clinically in acute state by Erythema, Vesiculation, Oozing & crusting while in chronic stage – Scaling & Lichenification.
- Eczema is synonymous with dermatitis.it is histologically characterized by spongiosis with varying degrees of acanthosis, and a superficial perivascular lymphohistiocytic infiltrate.

Classification of Eczema:

Eczema:

1. **Exogenous Eczema:-**
   a) Contact irritant dermatitis
   b) Allergic contact dermatitis
   c) Infective eczema

2. **Endogenous**
   a) Atopic dermatitis
   b) Seborrheic dermatitis
   c) Nummular eczema
   d) Stasis eczema
   e) Asteatotic eczema
   f) Discoid eczema
   g) Hand eczema
   h) Pityriasis Alba

Exogenous:

Contact irritant dermatitis

- An inflammatory reaction of the skin to an external agent or agents.
- Although inflammatory and immunological mediators may be activated, no memory T-cell function or antigen-specific immunoglobulins are involved.
- Common irritants are detergents, soaps, solvents and abrasives, alkalies, acids, oxidizing agents, reducing agents, animal's enzymes and secretions and desiccant powders, dust and soil.
- Common occupations are hairdressing, medical, dental, agriculture, catering, printing and painting, mechanical engineering, fishing and construction etc.

Clinical features; Varied clinical presentations may be seen ranging from dry lichenified erythematous lesions of chronic dermatitis to erythematous, exudative crusted, papulo-vesiculo-bullous lesions of acute dermatitis depending on the duration of contact, irritant potential and concentration of the irritant.

Allergic contact dermatitis: -

- Dermatitis developing after weeks to years of repeated contact with allergen, is quiet common.

- Mediated through delayed or cell mediated type of immunity and occur due to many dyes and their intermediates, oils, resins coal tar derivatives, chemicals used for fabrics, rubbers, cosmetics, insecticides, oils and resins of woods and plants as well as products of bacteria, fungi and parasites.

Clinical features - Erythema, swelling, papules and vesicles and on constant scratching lichenification develops. With specific allergens erythema multiforme like, purpuric reactions, lichenoid, papular eruptions, pigmentation and granulomatous reactions may develop.

❖ Most common recognized form is Phytodermatitis,other examples are photodermatitis, phytophotodermatitis.

Infective Eczema : Allergy due to inflammatory mediators released by infective organisms.

Endogenous Eczemas:

Atopic dermatitis:

- It is one of the manifestations of atopy. Atopy was coined by Coca in 1923, refers to predisposition to develop Asthma, allergic rhinitis & atopic dermatitis.
    - 70% Atopic patients have family history of at least one of the three atopic components.
    - Atopic patients have :
    - Blood & tissue Eosinophilia
    - Genetic predisposition to form excessive IgE antibodies to inhaled, injected, applied on surface or ingested antigens.
    - Increased sensivity to pruritis stimuli
    - Immune system dysfunction associated with decreased cell mediated immunity
    - Increased transepidermal water loss.
        - Atopic dermatitis can begin at any age although 60% develop it within the first year of life & 90% by fifth

Atopic dermatitis can be divided into three phases:

1. Infantile phase
2. Childhood phase
3. Adult phase

Major criteria

- Itching
- Typical morphology and distribution
- Chronic or chronic relapsing dermatitis
- Personal or family history of atopic disease

Following are minor crieria associated with Atopic dermatitis:

Dry skin

Double infra orbital skin fold called ***Dennie Morgan Fold***.

- Keratosis pilaris, Accentuation of palmar crease/icthyosis
- Increased IgE response
- Increased susceptibility to cutaneous infection HSV & Staph aureus.
- Pallor about nose, mouth & ears – ***Head Light Sign***.
- keratoconus

- Early onset of anterior subcapsular cataracts may be seen
- White dermographism
- Pityriasis alba
- Orbital darkening
- Nipple eczema
- Perifollicullar accentuation
- Food allergies
- **Hertoghe's sign** –loss of central $^{1}/_{3}^{rd}$ of eyebrow is +ve.
- Intolerance to wool and lipid solvents
- Psychological & immunological factors are important

Exacerbating factors: Excessive washing of the skin
Wool, synthetic fabrics
Foods particularly sea food, milk, eggs, etc
Sec. Infections due to staph etc

Diagnosis: Can be diagnosed best by clinical examination.
Itching is one of the major criteria for diagnosis.

Treatment:

1. Avoid provoking factors
2. Use of Emolients to reduce dryness
3. Acute case – Wet compresses
4. Topical steroids
5. Antibiotics for secondary infection
6. Treatment of choice tacrolimus.

Seborrheic Dermatitis:

❖ It is a chronic dermatitis with Erythematous sharply marginated lesions covered by greasy scales (Stuck on appearance)
❖ Area of distribution is distinctive with rich supply of sebaceous glands,namely the scalp, eyebrows, forehead & upper trunk
❖ Major complains are itching & burning sensations.
❖ Dandruff is earliest manifestation of Seborrheic dermatitis also known as pityriasis capitis.

Aetiology : complex interaction of pityrosporum ovale, seborrhea, and specific immunological response.
Associated conditions AIDS,epilepsy,parkinsonism,malabsortion .

❖ Two types: - Infantile (Scalp known as ***Cradle Cap***) - Adult (scalp,face, trunk,generalised),on the trunk most common is petaloid form.

Treatment: ❖ Topical glucocorticoids, Salicylic acids or Selenium Sulphide
❖ Oral ketaconazole, itraconazole

Nummular Eczema or (Discoid Eczema) :

- Single circular or oval plaque of Eczema with a clearly demarcated edge is characteristic (Coin like lesions)
- Mainly present over upper trunk & Extensor surface of limbs
- Cause is unknown
- It is an itchy condition

Treatment: Topical steroids, Salicylic acid, Coal tar

Stasis Eczema :

❖ Occurs in lower limbs secondary to chronic oedema & venous incompetence
❖ Stasis eczema starts at lower third of leg medial side of ankle over varicose vein.
❖ Hyperpigmentation of lesion is due to extravasation of blood & deposition of hemosiderin pigments.

Treatment: Elevation of leg, compression stocking & topical emollients
Steroid should be used cautiously, as it may retard healing

Asteatotic Eczema :

❖ Eczema associated with decrease in skin surface lipid
❖ Also known as Eczema Craqule, winter itch or Xerotic eczema
❖ Seen in elderly people, lower leg is the commonest site

Treatment: Emollients, mild steroids

Hand Eczema :

- The term hand eczema implies to the dermatitis largely confined to the hands, with only minor involvement of other areas.
- The common morphological variants are pompholyx, recurrent focal palmar peeling, fingertip eczema and patchy vesiculosquamous type**. Pompholyx** is more common in 10-40 yr. age group and presents with crops of clear vesicles. Itching is usually severe and resolves in 2-3 weeks.
- Recurrent focal palmar peeling was initially known as keratolysis exfoliativa. During summer months small area of superficial white desquamation develops on the sides of the fingers and on the palms or on the feet.
- Fingertip eczema involves mainly thumb and forefingers of dominant hand and presents as dry, cracked or painful fissuring of the skin. It is usually worse in winter and improves in holidays.
- Patchy vesiculosquamous type presents as asymmetrical patchy, irregular vesicles and scaly lesions on both hands

Pityriasis Alba-

- It is a nonspecific superficial dermatitis of unknown origin and has been regarded as a manifestation of atopic dermatitis.
- Rounded oral or irregular phaques which are red, pink or skin coloured are seen over face, mainly around mouth, chin and cheek. On healing that leave hypo pigments scaly patches.

Treatment : **General measures**

1. Reassurance and counseling of patient and parents regarding the trigger factor, treatment options, benefits and risks.
2. Protection from different chemicals and allergens with the help of wet mopping of floor, wearing of full sleeve clothes, gloves etc.
3. To avoid excessive drying or wetting of skin, with regular bathing and frequent topical application of emollients.

B. **Specific measures**

1. **Oral therapy**:

Antibiotics - If the lesion shows vesiculation and apparent infection, patient may be given antibiotics which cover mainly staphylococcus and streptococcus like Erythromycin and Cloxacillin.
Antihistamines - H1 receptor antagonists like promethazine etc can be given in liberal amount to decrease itching and also for sedation.
Others-Low dose cyclosporin, evening primrose oil, oral corticosteroid, Chinese herbal medicines, sodium cromoglycate, azathioprine, interferon gamma etc has been tried with variable success.

2. Topical Therapy
Topical steroids- These are the most commonly used agents.
Ichthammol and Tar- Preparations containing ichthammol and tar can be helpful as maintainance treatment in patients with lichenification.
Antifungals For seborrheic dermatitis topical selenium sulphide in shampoo base or topical terbinafine or ketoconzole can be used effectively to decrease M. Ovale load.
C. Other measures
UV radiation-phototherapy with UV B or UVA or combination of the two is helpful in atopic dermatitis

Chapter 5

REACTIVE SKIN DISEASES

This chapter deals with some of the conditions which represent a reaction to some specific exogenous or endogenous factor.

Reaction site is usually vascular and dermal.

ERYTHEMA MULTIFORME

- It is an immunologic reaction probably triggered by circulating immune complexes and characterized by lesions with varied morphology.
- Herpes virus infection is the most important cause of erythema multiforme (EMF).
- Other important agents include mycoplasma pneumonia, drugs and malignancies
- EMF is common in young adults
- Prodromal symptoms are minimal to absent
- The lesions seen are urticarial papules, target lesions, vesicles and bullae
- The lesions occur in a symmetric fashion on the extensor aspects of limbs, palms and soles
- The target lesions/iris lesions have three zones of colour: the central dark cyanotic area pale edematous zone and the surrounding erythema .
- The iris lesions result from centrifugal spread of a red maculopapule as the center becomes cyanotic, purpuric or vesicular
- Treatment is symptomatic if the herpetic lesions are clinically evident acycolvir need to be given.

STEVENS JOHNSON SYNDROME – TOXIC EPIDERMAL NECROLYSIS SPECTRUM

Stevens Johnson syndrome (SJS) and Toxic epidermal necrolysis (TEN) are closely related severe acute mucocutaneous intolerance reaction most often elicited by drugs and less so by infections.

They have been classified based on the area involoved as

- SJS- mucosal erosions and epidermal detachment below 10%
- SJS/TEN overlap-mucosal erosions and epidermal detachment between 10-30%
- TEN – mucosal erosions and epidermal detachment more than 30%

Stevens Johnson syndrome (SJS)

- The important drugs causing SJS are phenytoin phenobarbitone, sulfonamides, penicillins and NSAID's
- It is common in children and young adults
- The disease is preceded by a nonspecific prodorme with fever, myalgia, rhinitis and cough
- Skin lesions occur abruptly and are purpuric macules, atypical target lesions and papules
- Bullous lesions may occur in oral, genital and anal mucosa
- Ulcerative stomatitis with hemorrhagic crusting is the most characteristic feature
- Corneal erosions may lead to symblepharon, synechiae and opacities

- Constitutional symptoms may be severe during active stages
- The treatment includes supportive care and steroids

Toxic epidermal necrolysis (Lyell's syndrome)

- TEN is a rare life threatening mucocutaneous reaction characterized by widespread sheets of erythema, necrosis and bullous detachment of epidermis
- Incidence: 1 to 3 cases per million
- Pathogenesis: In predisposed patients, the drug metabolites may bind to epidermis and trigger an immune response leading to immunoallergic cutaneous adverse reaction
- Drugs causing TEN are antiepileptics (phenytoin, Phenobarbital, carbamazepine) , sulfonamides, ampicillin, allopurional, antituberculous drugs (thiacetazone, isoniazid) and NSAID's.

Clinical features

- TEN begins with sheets of erythema covering wide areas
- In hours, the skin lesions become painful and extremely tender and small vesicles and bullas appear over the involved skin
- The epidermis can be separated from dermis by slight tangential pressure (Nikolsky's sign)
- Mucosal erosions and conjunctival erosions are a constant feature
- Septicemia and bronchopneumonia are the important causes of death
- Staphylococcal scalded skin syndrome (SSSS) can be differentiated from TEN by occurrence in children absence of mucosal lesions and absence of systemic features. Moreover in SSSS, the involved skin is dry and parchment like while in TEN it is erythematous, purpuric and necrotic.

Treatment

- Patients have to be managed in an intensive care set up with proper maintenance of fluid and electrolytes
- Role of steroids is controversial
- Intra venous immunoglobulins have been found to be useful

ERYTHRODERMA (SYN. EXFOLIATIVE DERMATITIS).

- Inflammatory skin disease affecting more than 90% of the body surface.
- Condition presents as generalized erythema with scaling. The scales may be large, fine or bran - like. It is associated with burning, irritation, itching or a sensation of tightness.
- Disease occurs idiopathtic and secondary to a number of causes that include **eczemas** (atopic, contact, seborrheic) in 40% cases, **psoriasis** (40%), drugs ingestion like arsenic, gold, mercury, rifampicin, INH, Penicillins, barbiturates etc. (10%), other inflammatory skin disorders like lichen planus, dermatophytosis, crusted scabies, pemphigus foliaceous, staphylococcal scalded skin syndrome, toxic shock syndrome, hereditary disoders like ichthyosiform erythroderma or malignancies like **lymphomas, leukemia** and carcinoma of the breasts, bronchus, prostate etc. Males are affected two to three times, more frequently than females are usually over 45 years of age (excluding hereditary disorders and atopic dermatitis). Erythroderma is associated with profound metabolic disturbances that may prove fatal despite skilled management, especially in elderly people with death rates varying from 18% to 64%. It may cause temperature dysregulation in the form of hypothermia or hyperthermia, excessive fluid loss,

electrolyte imbalance, hypoalbuminemia, hypocalcemia and deficiency of iron, vitamin B12 and folic acid secondary to dermatogenic enteropathy and malabsortion, high output cardiac failure, hepatic and renal failure.

Management

- Immediate hospitalization. Protein and electrolyte balance, body temperature, circulatory status requires continuous surveillance. Adequate hydration should be maintained and cardiac, hepatic or renal failure must be promptly treated. Erythroderma secondary to drug reaction requires immediate withdrawal of the offending drug. Application of bland emolients prove to be very beneficial. Specific therapeutic modalities like methotrexate, azathioprine, cyclophosphamide, chlorambucil, cyclosporine and systemic corticosteroids are required according to the nature of the etiologic condition in severe persistent cases

DRUG ERUPTIONS

- A drug may be defined as a chemical substance, or combination of substances, administered for the investigation, prevention or treatment of diseases or symptoms, real or imagined.
- Drug eruptions are some of the most common skin disorders.
- They are seen in 2 to 3 % of hospitalized patients.
- These eruptions may closely mimic other skin disorders.

Characteristics of drug eruptions are:

1. There is a history of drug intake preceding the eruption. The history of drug intake must include all systemic drugs, nonprescription drugs, home remedies and topical medications. A previous history of allergic reaction may increase the risk of development of an allergic reaction.
2. Drug eruption is sudden in onset
3. Generalized eruption is often pruritic.
4. Eruption is bilateral and symmetrical; exception to this is fixed drug eruption.
5. Regression of eruption occurs on withdrawal of drug.
6. Similar type of rash recurs on re-exposure to the same or similar drug.

Undesirable cutaneous or mucocutaneous reactions to systemically absorbed drugs occur through two mechanisms.

1. Immune mechanisms: All the four hypersensitivity mechanisms may be involved.

Type 1 – IgE dependent reactions cause urticaria, pruritus, bronchospasm and laryngeal oedema within minutes, hours or days.
Type II- cytotoxic reactions may cause thrombocytopenia.
Type-III – Immume complex dependent reactions result in serum sickness, uritcarial or leukocytoclastic vasculitis within a week or so.
Type IV- Cell mediated immune response may lead to eczematous and other types of eruptions in 3 to 4 weeks time.

2. **Non-immune mechanisms:** These include drug induced hemolysis (G6PD deficiency) mast cell degranulation (codeine, radiocontrast media), exacerbation of disease (psoriasis by lithium or beta blocker), drug deposition in skin alopeica etc.

General rules

- Drug allergy is most frequent in older individuals and may be related to development of immune response and increased exposure to drugs.
- Topical application of drugs has the greatest propensity to induce allergy, followed by the intravenous route and the oral route.
- The drugs most often responsible for the eruptions are antimicrobials and antipyretic / anti-inflammatory analgesics.
- The appearance of the eruption may provide some clues to its cause (e.g., fixed drug eruptions associated with sulphonamides).
- Always keep in mind the fact that drug eruptions are great imitators of other skin diseases.
- The most common morphologic patterns of drug eruptions are exanthematous, urticaria and / or angioedema, fixed drug eruption, erythema multiforme and others.

Fixed drug eruption: It differs from other eruptions in that it occurs and then recurs at same sites with each exposure of mediation.. Single or multiple circular or oval erythematous macule/s or plaque/s develop with burning or stinging sensation. These lesions sometime develop into bullous lesions and when heal leave behind slate grey coloured pigmentation. Mucocutaneous junctions are commonly affected, genital and oral mucosa.

Diagnosis:

- Diagnosis is basically based on suspicion and history of drug intake. A gereral rule of thumb is that drugs started within one week of the onset of the eruption are the most suspect.
- Second step is **in vivo** testing .This includes patch testing, scratch prick testing and dechallenge rechallenge tests. Dechallenge rechallenge continues to be regarded as the most definitive method for ascertaining drug-induced reactions. However, it is often not an option if the patient has experienced a life threatening condition or if suspected agent cannot be continued.
- Third step is the **invitro t**esting which include radioallergosorbent assays (RAST) and Enzyme Linked Immunosorbant Assays (ELISA). Other tests include Lymphocyte Transformation Test (LTT), Macrophage Migration Inhabition Factor (MIF), Lymphocyte Toxicity Assay (LTA), Basophil Degranulation Test and Histamine Release tests.

Treatment:

- Withdrawal of all drugs
- Antihistamine (H1 antagonists)
- Soothing lotion for topical application
- Corticosteroids-topical, systemic
- Adrenaline in case of anaphylaxis
- Other measures like fluid and electrolyte balance maintenance, wet compresses, etc.

Dermatological manifestations of Drugs:

Urticaria **Asprin,barbiturates, penicillins, captopril, sulfonamide,**

	enalpril
Purpura	Steriods, phenytoin, alluprinol, ampicillin, methyldopa,indapamide.
Alopecia	Ethionamide, cytotoxics, heparin, beta blocker.
Hypertrichosis	Diazoxide, cyclosporine,minoxid
Fixed drug eruption	Sulphonamides, tetracycline, phenopthalein, dapsone, captopril.
TEN	NSAID, phenytoin, penicillin, allopurinol, sulphonamide,measle vaccine.
Erythema Nodosum	penicillin, oral contraceptive, sulphonamide.
Lichenoid eruptions	ATT, tetracycline, chlorpromazine,gold, arsenic, methyl dopa, antimalarial
Lupus erythematosus	procanamide,hydralazine, isoniazid, chlorthiazide, bleomycin, acebutol
Lymphadenopathy	phenytoin, primidone
Skin necrosis	Warfarin,methotrexate
Acneform eruptions	Corticosteroids, ATT,iodides,bromides.

Urticaria:

Definition: (Nettle – rash, hives, wheals) is transient eruption of Erythematous or Oedematous swelling of dermis usually associated with itching. Urticaria and angioedema are cutaneous manifestations of localized non- pitting oedema.

Urticaria can be:

- Immunogenic
  - IgE dependent
  - Bradykinin mediated
  - Complement mediated
- Non immunogenic
  Direct mast cell releasing agents (radiocontrast dye, D- tubucurarine,antibiotics)
  Agents altering the arachidonic acid metabolism (aspirin,NSAIDs,azo dyes)
- idiopathic

Urticaria can also be divided into:

- Acute < 6 weeks
- Chronic > 6 weeks

Urticaria can be classified as follows:

- Physical urticarias (cold,heat,cholinergic,aquagenic,solar etc)
- Hereditary angioedema
- Contact urticarias

Urticaria is due to a local increase in permeability of capillaries & small venules. Main mediator is Histamine.
Others are Prostaglandins (D2 + I2) , kinins,proteases, leukotrienes, eosinophilic & neutrophils, chemotactic factors etc.

Angiodema : extention of urticaria into subcutaneous tissue .

- Commonest sites are lips, eyelids & genitalia
- Tongue & Larynx may be affected
- Acute in onset, itching is absent

Hereitary angio oedema : (quinckes's oedema)

- 1% of all cases of angioedema
- Autosomal dominant
- Onset is usually in early childhood but may be delayed into adult life.
- Recurrent swelling of face,arms,genitalia,hands,buttocks and legs & mucous membranes often associated with nausea, vomiting, colic & urinary symptoms.
- C1 estrase deficiency
- Response to conventional treatment is poor
- Danazole/ Stanozolol
- Replacement therapy with fresh frozen plasma can be helpful.

Acquired C1 esterase inhibitor deficiency:

- Clinically similar but later in onset
- Type 1 May be associated with B cell lymphoma, CLL,myeloma,breast carcinoma, SLE.
- Type –II is due to autoantibodies to C1 estrase inhibitor proteins
- Treatment – Danazol or steroids, antifibrinolytic agents

Chapter 5

BLISTERING DISEASES OF SKIN

Blistering Diseases:

- There are different types of blistering diseases which can result because of varied etiologies and can present as vesiculobullous lesions. These can be of two distinct types.
- Immune mediated, acquired vesiculobullous disorders (pemighigus, bullous pemphigoid, dermatitis herpetiformis, chronic bullous dermatosis of childhood, epidermolysis bullosa acquisita). Congenital vesiculobullous diseases (epidermolysis bullosa).

Acquired

Pemphigus

- Pemphigus occurs because of disruption of the intercellular cementing substance due to an autoantibody attack on the cellular adhesion proteins (desmogleins) leading to acantholysis and collection of fluid.
- Pemphigus group of disorders include two major types
    - Pemphigus vulgaris (variant – Pemphigus vegetans): level of split suprabasal
    - Pemphigus foliaceous (variant – Pemphigus erythematosus): level of split – subcorneal

- The other minor types of pemphigus include paraneoplastic pemphigus, drug induced pemphigus, IgA pemphigus and neonatal pemphigus

Pemphigus vulgaris

- Most common form of pemphigus, accounting for up to 80% of pemphigus cases. Occurs at any age, most commonly between fourth – sixth decades. In India, it occurs at younger age
- It is due IgG antibodies directed against epidermal cell adhesion molecules (desmoglein 3) – disruption of intercellular cementing substance – loss of adhesion between epidermal cells (acantholysis) – intraepidermal blistering
- Clinical features
    - Mucosal lesions, 50-70% present with painful oral erosions. Lesions may be limited to oral cavity for months to one year
    - Skin – Non itchy flaccid bullae on normal or erythematous skin, with a predilection for scalp, face trunk, axillae and groins and pressure sites. Bullae rupture producing painful erosions that show not tendency to heal spontaneously
    - Nikolsky's sign and Bulla spread sign (Asboe – Hansen sign) is positive. (Other disorders with positive Nikolsky's sign are staphylococcus scabled skin syndrome, toxic epidermal necrolysis etc.)
    - Other mucosa involved are conjunctiva, pharynx, larynx, esophagus, urethra, vulva and cervix
    - Prognosis is poor without treatment but with systemic steroids mortality has been reduced to 5-15%
- Pemphigus may be associated with other autoimmune disease such as thymoma, myasthenia gravis and malignancies like Non Hodgkin lymphomas , CLL, spindle cell tumors and bronchogenic carcinoma
- Diagnosis
- Tzanck smear from the floor of the blister shows acnatholytic cells. Acantholytic cell is a large, rounded epidermal cell with a large nucleus, perinuclear halo and peripheral condensation of cytoplasm
- Histopathological examination of a blister shows a supra – basal cleft in the epidermis. The basal keratinocytes remain attached to the basement membrane but are separated form each other and stand like a **'row of tombstones'.**
- Immunoflurescence studies are the **gold standard** in diagnosis of the autoimmune blistering disorders. In pemphigus vulgaris, direct immunogluorescence done on the lesional skin shows deposition of intercellular IgG throughout the epidermis in a **'fish-net'** pattern. Indirect immunofluorescence done to determine levels of pathogenic antibodies in the sera of the patients shows circulating intercellular IgG antibodies in 80-90% of the cases. Levels of these antibodies correlate with disease activity
- Pemphigus vegetans is a clinical variant of pemphigus vulgaris characterized by vegetating lesions primarily in the flexure. Initial lesions are bullae or pustules, which rupture and progress to form vegetating plaques

Pemphigus foliaceous

- This disorder, characterized by blistering at a higher level in the epidermis is less common than pemphigus vulgaris and accounts for only15-20% of pemphigus cases.
- It is caused by IgG antibodies directed against desmoglein-1 protein

- Clinically, pemphigus foliaceous is less severe than pemphigus vulgaris and is characterized by crusted, moist, scaly lesions in a seborrheic distribution involving scalp, face, chest and upper back. Blistering may not be obvious due to the superficial level of the split (very transient nature of blisters)
- Oral lesions are uncommon
- Nikolsky's sign is invariably positive
- Diagnosis
  - Tzanck smear from fresh erosion shows acantholytic cells
  - Histology shows a subcorneal cleft with acantholysis
  - Immunofluorescence findings are usually indistinguishable from pemphigus vulgaris
- Prognosis of this disorder is better than pemphigus vulgaris and this is a benign disorder, which responds well to treatment.
- Pemphigus erythematosus is variant of pemphigus foliaceous characterized by immunological features of both pemphigus and lupus erythematosus (LE), that is, intercellular IgG C3 in the epidermis (as in pemphigus) and in the basement membrane zone (as in LE) and antinuclear antibodies (as in LE). Clinically, erythematous, scaly rash over the nose and cheeks simulate LE while lesions on the trunk are similar to those in pemphigus foliaceous

Other variants of pemphigus

- **Endemic pemphigus foliaceous (**Fogo Selvagum) is a variant of pemphigus foliaceous, endemic to certain parts of South America and is postulated to be precipitated by bites of the black fly (Simuliidae). The burnt appearance and burning sensation gave the disease its name, fogo selvagum, meaning "wild fire"
- **Drug induced pemphigus** (penicillamine, captropril, pyritinol, penicillin, rifampicin, piroxicam,phenobarbital) – clinically commonly present as pemphigus foliaceous
- **Paranoplastic pemphigus** – a polymorphous blistering eruption with mucocutaneous ulcerations having an underlying neoplasm
- **Pemphigus herpetiformis** – superficial vesicles and inflammatory papules occur in herpetiform distribution
- **IgA pemphigus** – has bound and circulating IgA autoantibodies against intraepidermal cell surface antigens and clinically may resemble subcorneal pustular dermatosis
- **Juvenile pemphigus –** pemphigus occurring before 20 years of age
- **Neonatal pemphigus** – due to transplacental transfer of maternal anti – intercellular cement substance antibodies to the fetus. Blisters resolves in 2 weeks

Treatment of pemphigus

- The mainstay of therapy in the pemphigus group of disorders is with systemic steroids, which can be given as conventional therapy (oral prednisolone in the dose of 1 mg per kg body weight) or as pulse therapy.
- The other modalities of therapy include adjuvant therapy with dapsone, azathioprine, cyclosporine, methotrexate, gold salts and Plasmapheresis and are essentially to reduce the side effects or to control the severe form of pemphigus

Bullous pemphigoid (BP)

- Autoimmune blistering disorder of the elderly, with onset usually after 60 years of age

- Basic pathogenic process is due to IgG antibodies against components of the basement membrane zone (BMZ – structure which binds epidermis to the underlying dermis and mesenchyme) – loss of structural integrity of the BMZ due to resultant inflammation – separation of the intact epidermis from underlying dermis – subepidermal cleft formation
- Clinical features
  - Preceded by pruritus with or without uriticarial wheals lasting usually for 1-3 weeks
  - Tense bullae on normal or erythematous skin predominantly over flexural aspects of the limbs, lower abdomen, groins and axillae. Facial skin and scalp relatively spared
  - Lesions rupture to leave erosions that heal spontaneously with postinflammatory hyperpigmentation
  - Nikolsky's sign usually negative; Bulla spread sign +/-
  - Mucosal lesions rare and less severe than in pemphigus vulgaris
- Bullous pemphigoid may be associated with an underlying malignancy (gastric carcinoma commonly) and may be associated with diabetes mellitus, rheumatoid arthritis psoriasis
- **Diagnosis**
- Tzanck smear will show numerous eosinophils with few neutrophils but no acanthyolytic cell
- Histopathological examination reveals subepidermal cleft with intact epidermis forming the roof of the blister
- Direct immunofluorescence of perilesional skin shows linear IgG and C3 deposition in the basement membrane zone. Indirect immunofluorescence studies done on the patient's sera show circulating IgG autoantibodies in most cases but unlike in pemphigus, their titers do not correlate with disease activity
- Prognosis of bullous pemphigoid is better than pemphigus and it runs a chronic self – limiting course. It may be fatal in the active stage in the elderly or debilitated patients

Treatment

The mainstay of treatment is a topical or systemic steroid

Dermatitis herpetiformis (DH)

- DH is defined as an intensely pruritic, chronic, recurrent, papulovesicular disease with an underlying gluten – sensitive enteropathy, which may be asymptomatic.
- **Clinical features**
  - Onset at any age, usually between 20-55 years of age
  - Males outnumber females
  - Pruitus is the first and predominant symptom followed by a symmetrical eruption of erythematous papules and papulovesicles, which are so rapidly excoriated that intact vesicles are difficult to demonstrate
  - Sites – extensor aspects of limbs (elbows and knees), buttocks, natal cleft, shoulder upper back, face and scalp. Grouping of lesions accounts for it being described as herpetiformis (not associated with herpes virus)
  - Oral lesions are common but asymptomatic
  - Provocation of lesions occurs with iodides orally or in iodide patch testing
  - Hitologically examination best done on lesions that have not blistered or ruptured and reveals neutrophilic microabscess at the tips of dermal papillae
  - Direct immunofluorescence is the most reliable diagnostic criterion and should be performed on clinically normal skin (preferably of the buttocks). It reveals granular IgA deposits in dermal papillae

- Indirect immunofluorescence is negative for anti – BMZ or dermal autoantibodies but antithyroid and antigliadin antibodies may be seen

Treatment

- Dapsone 100 –200 mg/day (upto 400 mg/day) is the drug of choice
- Strict adhrence to a gluten – free diet for prolonged periods (eg. 6 to 12 months) may control the disease in some patients, obviating of reducing the requirement for drug therapy

Chronic bullous dermatoses of childhood (CBDC)

- CBDC is defined as a chronic acquired autoimmune subepidermal blistering disease of children characterized by IgA BMZ antibodies
- Onset is usually at around 5 years of age (toddlers and preschool children)
- Uriticarial plaques with blistering at the edges – 'string of pearls'or 'cluster of jewel' appearance and localization of lesions around orifices (perioral, perigenital)
- Spontaneous remission usually occurs with age
- Direct immunofluorescence shows linear IgA at BMZ
- Dapsone is usually effective, and may be combined with low dose steroids in refractory cases

- **Herpes gestationis** is non-viral_autoimmune blistering disease of young women that occurs in pregnancy (21 – 28 weeks of gestation) or within 1st week postnatal. Clinically the disease starts as severe Pruritus with urticarial wheals and plaques followed by blistering predominanatly in the periumblical area, lower abdomen and thighs. Mucosal involvement is rare and lesions improve postpartum. Recurrence may occur in subsequent pregnancies, premenstrually or with oral contraceptive pills (OCPs). Direct immunofluorescence shows linear C3 deposits at the BMZ with IgG in some cases

	P.V.	Pemphi- - goid	Linear IgA Dermatosi s	Herpes Gestationi s	CBDC	DH
Age of onset	30 – 50 yrs	50 – 80 yrs	Middle age	Preg. women	1st decade of life	3rd decade of life (20 –30yrs)
HLA associatio n	HLA DR4, HLA A – I0, A26	NIL	NIL	NIL	HLA – BM8	HLA – B8, DRW-3
C/F	Discrete, Flaccid, Bullae arising over normal skin, scalp,	Tense Bullae over urticarial plaques. Flexures Nikolsky & Bulla	Blister smaller than Pemphigoi d > DH, Flexural areas	Large bulla, Erythe-Matous, oede-Matous, Papulo-vesicles &	Grouped, tense vesicles & bullae 'cluster of jewel' pattern flexure &	Vesicles & Papulo vesicles 3 – 6mm in size. Symmet-rical over extensor

	chest, back inter triginous areas, Nikolsky & Bulla spread +ve	spread sign -ve		plaque abdomen, palms, soles, chest	pelvic region	surfaces Elbow, knees
Mucosal involvement	Involved in almost all cases	Oral lesions 20%	Infrequent	Mucosal spared	Spared	Spared
Variants	Pemphigus foliacus, vegetans, erythematous	Classsical bullous vesicular, nodular	NIL	NIL	NIL	NIL
Associated features	M.G, Thymoma	NIL	NIL	NIL	NIL	Gluten sensitive Entero-Pathy
Precipi-tating Features	Drugs - PPCR	NIL	NIL	Pregnancy	NIL	Ingestion of Gluten
Location of Blister	Intra Epidermal suprabasal – PV Subcorneal - PF	Sub Epidermal Lamina ducida BMZ	Sub epidermal	Sub Epidermal	Sub Epidermal	Papillary TIPs
DIF	Deposition of IgG & C3 in intracellular space	Linear deposition of IgG & C3 at the Lamina Lucida of BMZ	Linear deposition of IgA at BMZ	Linear deposition of C3 at BMZ IgG also	Linear deposition of IGA BMZ	Granular deposits at the tips of Papilla uninvolved skin
Treatment	High doses Cortico Steroids, Immunosuppressive	Mod – high doses of steroids, Immunosuppressive	Dapsone alone or with steroid	Cortico steroids	Dapsone	Dapsone

Congenital

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- **Epidermolysis bullosa (EB)** comprises a group of genetically determined skin disorders characterized by blistering of the skin and mucosae at birth or soon afterwards, following mild mechanical trauma (due to increased fragility of skin). three main types of EB are
    - EB simplex (intraepidermal)
    - Junctional EB (split through the basement membrane zone)
    - Dystrophic EB (split in the subepidermal level)
- **EB simplex** is the commonest and mildest form of EB of autosomal dominant inheritance. Due to defective keratin tonofilaments. It is characterized by onset of blistering over trauma prone sites at birth or infancy. Lesions heat without scarring. Mucosae, nails and hair are essentially uninvolved.
- **Junctional EB** are autosomal recessive disorders due to defective lamininV and are broadly classified into two main types, the lethal and non-lethal forms. They present at birth or soon after with severe fragility of the skin leading to extensive blistering and denudation. Orophayngeal mucosae may be severely involved. Teeth may be malformed and prematurely lost and nails may be shed. This is the most fatal type of EB
- **Dystrophic EB** is because of defective collagen VII, characterized by skin fragility, scarring with milia, nail changes and have either autosomal recessive or dominant inheritance. The most severe autosomal recessive form is characterized by
    - Onset at birth or early infancy
    - Blistering of skin mainly over trauma prone sites
    - Oral blisters and scarring leading to ankylogossia
    - Oesophageal lesions causing painful dysphagia and later oesophageal strictures
    - Perianal blistering, erosions and scarring causing stenosis and fecal retention
    - Ocular complication – symblepharon, corneal erosions and opacity
    - Repeated blistetring and progressive scarring --- contractures and deformities (e.g. **'Mitten hands'**)
- Diagnostic techniques include skin biopsy, electron microscopy to ascertain the level of split and structures involved, antigen mapping and immunohistochemistry. No autoantibodies are demonstrated in the sera. Prenatal DNA testing can be advised to couples at risk of having affected children
- No specific treatment is available for EB and thus the mainstay of treatment is based on avoidance of provoking factors. Management of the neonate includes maintaining adequate nutrition and hydration and prevention of sepsis. Other aspects include care of the oral cavity, teeth, eyes and management of contractures and deformities
- Gene therapy appears as a realistic goal in the future

Epidermolysis bullosa acquistia (EBA)

- It is defined as a chronic, acquired autoimmune blistering disorder characterized either by trauma – induced subepidermal l blistering or with a clinical picture indistinguishable form bullous pemphigoid
- IgG class of autoantibodies directed against collagen VII causes it. Collagen VII is the major component of the anchoring fibrils found in the subepidermal zone; (** differentiate from hereditary epidermolysis bullosa dystrophica in which there is a collagen VII structural defect leading to reduced or absent collagen VII in the anchoring fibrils)
- Clinically this presents in two forms

- Mechanobullous type – blistering over trauma prone sites, which heals with scarring and milia formation; nails may be dystrophic
- Bullous pemphigoid (BP) like – mimics bullous pemphigoid and has a better prognosis
- Mucosal lesions may be present in a variable number of patients
- Histology shows subepidermal cleft with neutrophilic infiltrate in the BP type while sparse inflammatory infiltrate in the mechanobullous type
- Direct immunofluorescence on perilesional skin shows thick polyclonal band of deposition of IgG and C3 and sometimes IgA and IgM in the BMZ
- Steroids in combination with dapsone or adjuvant immunosuppressive are the usual line of therapy. The mechanobullous type is resistant to most modalities of treatment
- genetalia and oesophaus. Sequelae include oropharyngeal adhesions, oesophageal strictures, stridor, introital shrinkage, symblepharon and ‘statue eye’. Unlike bullous pemphigoid, this disorder is not self-limiting and has a chronic debilitating course

Chapter 7

DISORDERS OF HAIR

Alopecia

- Physiological hair loss is defined as the loss of < 100 hair/day. Alopecia is the term used to denote loss of hair localized to the scalp.

Alopecia or loss of hair can be divided into two types

- (1) Non scarring Alopecia (non-cicatricial)
- (2) Scarring Alopecia (cicatricial)

(1) **Non Scarring** – 1. Androgenetic alopecia
2. Telogen effluvium
3. Anagen effluvium
4. Metabolic disorder
5. Trichotillomania
6. Alopecia Areata

(2) **Scarring type** – Physical injuries – Burns
Radiation exposure
Mechanical trauma

Infection – Kerion
Favus

Autoimomune – Lichen Planus

- DLE
- Dermatomyositis
- Pseudopelade

1) **Androgenetic Alopecia –** Male pattern Baldness
It is a physiological process in genetically predisposed individuals
Terminal hair is progressively transformed into 'Vellus' type of Hair, Known as Miniaturization process.
Hair loss pattern – In scalp Hair loss in male
   - Hamilton classification of Hair loss in males
   - Modified by Norwood
   - Ludwig classification in females

   Treatment – minoxidil, finestride and surgical correction

2) Alopecia Areata
Aetiology – Autoimmune disorder, Viral infection Emotional stress
C/F –

a) Circumscribed, totally bald, smooth patch over the scalp or eye brows, may be beard area
b) Exclamation marks hair may be present at hair margins, indicates activity of disease

Ikeda classification for Alopecia Areata

Can be classified into four types –

1. Common type – 83%
2. Atopic type – 10
3. Prehypertensive type – 4%
4. Combined type

Prognostic Criteria for AA – Bad prognosis if

(1) Early onset of disease – Prepubertal
(2) Associated Atopy
(3) Ophiasis
(4) Onchodystrophy

Nail changes –

1. Diffuse, fine regular,pitting
2. Ridges
3. Onychodystrophy
4. Cross fissures
5. Pterygium

Treatment – (1) Minoxidil
(2) Counter irritant – DNCB – Dintrochlrobenzene
(3) PUVA DCB – dipencyprone
(4) Steroids

Trichotillomania Alopecia resulting from deliberate, at times unconscious efforts of the patients who are under tension or psychologically disturbed is called trichotillomania. It is twice as more common in females than in males and peak incidence is 11-17 yrs. in females and 2-6 yrs in males. The patient twists hair around fingers and pulls it resulting in the breakage of hair. The sites most frequently involved are the frontal and parietal regions. This results in illdefined patch with twisted hair broken at various distances from clinically normal scalp. Most characteristically, the plucked area covers the entire scalp apart from the margin. This is called Tonsure alopecia or **ORENTRIECH** sign. Treatment includes psychological and behavioural therapy.

Telogen effluvium: It represents excess shedding of hair (>100/day) which are in resting (telogen) phase of hair cycle.

Causes:

- Several factors such as surgery, anaemia, Vit. B12 deficiency, zinc,biotin,folic acid, deficiency, parturition, rapid weight loss, acute febrile illness, drugs (anticoagulants, b –

Blockers, retinoids,colchicine) and endocrinal problem (hypo-hyperthyroidism, hyperpitutarism are incriminated.

- Hair Loss usually occurs 2-3 months after the causative agent continues for 3-6 months but always terminates in recovery.
- Increase in the proportion of resting telogen hair follicles. Diffuse thinning of hair with increase shedding of hair is the sriking features. It is a self limiting condition and the treatment consists of assurance and care of underlying cause. In chronic cases, 2% minoxidil solution can be used topically.

Anagen effluvium

- Seen in patients undergoing chemotherapy (andriamycin,daunorubicin)
- Hair loss occur even in anagen phase
- Reversible in nature

Traction alopecia

- Seen in the patients fond of keeping very tight ponytail
- Wearing head bands

Chapter 8

DISORDERS OF SEBACEOUS, SWEAT GLANDS

Disorders of the sebaceous glands

Acne vulgaris:

- Acne vulgaris is a self limited disease, seen frequently in adolescents, primarily involves the sebaceous follicles. Most cases of acne are pleomorphic, presenting with a variety of lesions-comedones, papules, pustules, nodules, and as sequelae to active lesions-pitted or hypertrophic scars.

Pathogenesis

Four major factors are involved in the pathogenesis:

1. Increased sebum production

2. Hypercornification of the pilosebaceous duct
3. Microbial flora
4. Inflammation

1. **Increased sebum production**
   Acne patients, male and female, excrete on average more sebum than normal subjects and the level of secretion correlates with the acne severity.
2. **Ductal hypercornification**
   Hypercornification of pilosebaceous ducts presents histologically as microcomedones and clinically as blackheads and whiteheads. Thus comedones represent the retention of hyperproliferating ductal keratinocytes in the duct.
3. **Bacteria**
   Acne is not infectious. However three major organisms isolated – propionibacteria (P. acnes, P. granulosum, P. avidum), Staphylococcus epidermidis and Malassezia furfur. Environment of bacteria (i.e. low pH, reduced oxygen tension and bacterial lipases, proteases etc) more important than absolute numbers.
4. **Inflammation**
   The dermal inflammation is not caused by bacteria in the dermis but from inflammatory mediators that diffuse from the follicle where they are produced by P. acnes.

Natural history

- Usually starts in adolescence and resolves by mid-twenties
- At least some degree of acne affects 95% and 83% of adolescent boys and girls
- Acne develops earlier in females than in males.
- At the age of 40 years, acne may persist in 1% of males and 5% of females.
- Occurs predommantly on the face (99%), back (60%) and chest (15%). Infraorbital area spared even in severe acne.
- Two type or lesions – 1. Non-inflammatory (comedones)
  2. Inflammatory
- Comedones are the pathognomic lesions of acne. This is a conical raised lesion with a broad base and a plugged apex. Two types of comedones- blackheads open comedones (Black colour due to oxidation of melanin) and whiteheads closed comedones
- 25% of the whiteheads resolve within three days while another 75% develop into inflamed lesions
- Nodules occur more frequently in males and may be interconnected with sinuses.
- In its most severe variant acne can present with cysts and abscesses.
- Some amount of scarring in 90%. These could be hypertrophic scars keloids artrophic scars or ice-pick scars.

Treatment

- Treatment involves counseling, acne assessment and appropriate and ethical prescribing based on the history , acne severity, lesion type and the psychological effects of the disease. The various modalities of treatment can be classified into topical and systemic therapies.

Topical

- Predominantly comedolytic
  1. Tretinoin (reduce number of existing comedones and prevent formation of new comedones by loosening ductal keratinocytes)
  2. Adapalene
  3. Azelaic acid

- Predominantly antimicrobial
    1. Clindamycin
    2. Erythromycin
    3. Benzoyl peroxide
    4. Tetracycline

Predominantly anti-inflammatory

5. Adapalene
6. Topical antibiotics
7. Combination preparations
8. Zinc and erythromycin
9. Benzoyl peroxide and erythromycin

Systemic

- Oral antibiotics (Oral minocycline, doxycycline, erythromycin trimethoprim)
- Hormones (anti-androgens like cyproterone acetate, flutamide, estrogens, spironolactone, finasteride)
- Isotretinoin
- Corticosteroids (co-prescribed with isotretinoin in severe acne variants)

Miscellaneous

- Oral zinc
- Dapsone (nodulocystic acne)
- Clofazimine (acne fulminans)
- NSAID's (to reduce inflammation)

Surgical procedures

- Comedone extraction
- Aspiration of cysts
- Incision and drainage (large cysts)
- Intralesional steroid (0.1 ml triamcinolone injected into base of the cyst; reduces scarring)

Acne scar surgery

- Dermabrasion
- Laser abrasion
- Chemical peel

Acne conglobata:

- It is a rare type of acne, which is highly inflammatory and presents with comedones, nodules, abscesses and draining sinus tracts. Healing occurs with severe scarring. It usually starts in adult life. **Oral isotretinoin** is the best treatment for patients in whom antibiotics are unsuccessful or in patients with very severe deep acne like this one.

Acne fulminans:

- It is characterized by the sudden appearance of massive, inflammatory, tender lesions over the back and chest that rapidly become ulcerative and heal with scarring,associated with fever and joint pain. The disease exclusively occurs in teenage boys. The face is often not involved.

Rosacea:

- It is a centrofacial disease, which is characterized by papules and papulopustules against a vivid erythematous background with telangiectases, preceded by episodes of flushing. Later, there may be diffuse hyperplasia of connective tissue with enlarged sebaceous glands, particularly of the nose (rhinophyma).ocular findings are blephritis,recurrent chalazion and conjunctivitis. Women are more often affected than men in their third and fourth decade. Topical metronidazole gel or cream of broad-spectrum oral antibiotics is usually effective. Tetracycline 1 gm per day in divided doses is most effective and has few side effects with long-term use.

Perioral dermatitis:

- It is facial dermatosis predominantly affecting females of childbearing years. The dermatosis is characterized by an erythematous, micropapular, fine scaling eruption classically affecting the nasolabial folds, chin, and upper lip, sparing a rim of skin at the vermilion border. Treatment with tetracycline 1 gm per day in divided doses (between meals) is often effective.

Disorders of eccrine sweat glands

- Disorders of eccrine sweat glands may be broadly classified into four-chromohidrosis, hyperhidrosis, hypo-or anhidrosis and miliaria.

Chromohidrosis: It means secretion of coloured sweat.

Hyperhidrosis:

- It means excessive sweating which could be localized or generalized. It may occur in consequence of a number of causes. Most commonly excessive sweating of the palms and soles occurs during mental stress, and may be associated with tachycardia and vasomotor instability.

- Tap water iontophoresis is the most effective, safe and inexpensive therapeutic modality for palmopantar hyperhidrosis. Local injection of botulinum toxin is a new modality of treatment for palmar hyperhidrosis.

Miliria occurs because of obstruction of eccrine sweat glands

Fox Fordyce disease occurs because of obstruction of apocrine glands

Chapter 9

METABOLIC & NUTRITIONAL DISORDERS

Porphyria:

- Ther term "porphyria" is derived from the Greek word for "purple" and originally referred to the red topurple colour of patients affected by acute intermittent porphyria. Other forms of porphyria produce urine that varies form pink to red to brown. Unlike findings with Hematuria and pigmenturias (e.g., hemoglobinuria due to hemolysis, myoglobinuria cuased by rhabdomyolysis), routine dipstick tests are negative for the presence of heme in porphyria patients
- Porphyrins also account for the fluorescence of urine viewed with a Wood's lamp
- Porphyrias are hereditary disturbances in the synthesis of heme involving well defined enzymatic defects.
- Almost all are inherited in an autosomal dominant pattern except congential erythropoietic porphyria which is inherited as autosomal recessive manner
- In addition, although the enzyme defects are genetic and permanent, the symptoms are often intermittent and do not appear until puberty except in congenital erythropoietic porphyria and hepatoerythropoietic porphyria (both manifest in infancy or childhood, resemble clinically each other). This is true in porphyria cutanea tarda, acute intermittent porphyria, and variegates porphyria.
- Factors which precipitate are few m's: medication, malnutrition and medical illness

Clinical Classification

- These disorders can be classified into those without vesicobullous lesions and those associated with them

- The former includes delta aminolevulinic dehydratase deficiency porphyria and acute intermittent porphyria (have no cutaneous manifestatioins), and erythropoietic protoporphyria (can cause photosensitivity, but vesibullous lesions are rate).
- The latter includes congenital erythropoietic porphyria (Gunther's disease), hepatoerythropoietic porphyria, hereditary coproporphyria, variegate porphyria (most prevalent in white population of south Africa) and porphyria cutaneous tarda (PCT)

Congenital Erythropoietic Porphyria

- Congenital erythropoietic prophyria manifests in infancy or early childhood
- It is the result of defective activity of the enzymes uroporphyrinogen cosynthase
- Clinical manifestations include severe bullous cutaneous photosensitivity, hypertrichosis, erythrodontia, hemolytic anemia with Splenomegaly, and bone abnormalities. However, the first clue to the diagnosis in infancy is generally not one of these striking cutaneous changes, but rather the pink or burgundy discoloration of urine
- Treatment of this disorder is aimed at the cutaneous photosensitivity or at the anemia and its complications. Sun protection and ingestion of beta carotene may ameliorate some portion of the photodamage. Other modalities, chronic transfusions regimens and splenectomy, the risks must be weighed against the severity of the disorder in each individual case.
- **Porphyria Cutaneous Tarda** was first recognized by Waldenstrom in the 1930s, who identified a group of patient with excessive porphyrins in the urine, skin lesions in light exposed areas and a late ('tarda') onest in adulthood (in contrast with Gunther's disease), so he called the disease 'porphyria cutanea tarda'
- Clinical signs include darkening of the urine and cutaneous photosensitivity manifested as fragility and bullae of sun exposed skin, scarring, hypertrichosis and pigmentary and sclerodermoid changes. In severe cases, the clinical appearance may be similar to that of congenital erythropoietic porphyria
- Unlike other porphyrias, it is usually not inherited and responds to different treatments (venesection and antimalarias)

Pseudoporphyria may be drug induced (naproxen,nalidixic acid, furosemide, tetracycline, alcohol), haemodialysis, hepatic carcinoma.

Primary systemic amyloidosis (acquired systemic amyloidosis)

- Seen in patients of B cell or plasma cell dyscrasias and multiple myeloma
- Fragments of monoclonal immunoglobin light chains form amyloid fibrils.

c/f combination of macroglossia and cardiac,renal, hepatic and skin lesions
purpura following trauma **"pinch purpura**" on face is classical lesion

Sec. systemic amyloidosis

- Seen in patients of chronic inflammatory disease
- fibril protein is derived from circulating acute phase lipoproteins known as serum amyloidal.
- No skin lesions

Primary cutaneous amyloidosis

- Primary cutaneous amyloidosis is defined as cutaneous amyloidosis in the absence of other systemic or dermatological disease
- The various localized forms of primary cuteaneous amyloidosis include the more common papular (lichen amyloidosus) and macular and macular types and the rare nodular or tumefactive form
- Lichen amyloidosis is the most common form characterized by numerous pruritic, brownish lichenoid papules distributed over the extensor surface of legs and forearms and upper back
- Macular amyloidosis typically manifests as brownish patches with a reticulate or rippled pattern, involving the upper back, arms and lower extremities
- In some patients features of both lichen and macular amyloidosis can coexist and the term 'biphasic amyloidosis', has been coined for these. Extensive variants of both macular and popular amyloidosis have also been described
- On the other hand, amyloidosis cutis dyschromica (ACD) is a rare distinct type of primary cutaneous amyloidosis, which is characterized by reticulate hyperpigmentation with hypopigmented spots seen almost all over the body without any papulation
- Treatment is symptomatic with topical corticosteroids and sometimes dermabrasion

Xanthomatoses

- Xanthomas are composed of masses of lipid contaning histiocytes forming papular, nodular, and plaque like lesions in the skin, tendons and sometimes in the internal organs. Xanthomas are important clinical findings as they often evolve in the presence of elevated blood lipids and lipoproteins. Lipoproteins are macromolecular complexes that carry hydrophobic plasma lipids, particularly cholesterol and triglycerides, in the plasma. An elevation of serum lipid levels is called hyperlipidemia or hyperlipoproteinemia while the term dyslipoproteinemia signifies abnormalities in serum lipoproteins, whether or not serum lipid levels are categorically elevated or not. Of clinical interest is the fact that different species of lipoproteins are altered in typically different types of xanthomas. Thus, the type of xanthoma observed in a particular patient provides important as to the type of hyperlipoproteinemia

Xanthelasma palpebrum

- Soft, velvety papules and plaques arranged around eyelids
- Common sites – upper eyelid, inner canthus
- Signify a systemic hyperlipidermia – usually LDL elevations
- Usually occur in normolipidaemic individuals but may be seen in familial hypercholesterolemia, dysbetalipoproteinemia, mixed hyperlipidemia

Tuberous Xanthoma

- Firm, yellow – orange, often with an erythematous halo, small papules (0.5 cm in diameter) to lobulated tumours (2.5 cm or more)
- Usually painless but may be tender on pressure
- Sites – knees, elbows, buttocks and pressure points, typically bilateral

- Seen with raised LDL levels – Familial hypercholesterolemia, dysbetalipoproteinmia and secondary hyperlipidemias (hypothyroidism, chronic biliary disease)

Tendinous Xanthoma

- Slowly enlarging subcutaneous nodules attached to tendons, ligaments, fascia and periosteum (sub-periosteal)
- Autosomal recessive
- Overlying skin appears normal
- Sites – extensor tendons of hands and feet, Achilles tendon, sub – periosteal bony prominences such as malleoli and elbows
- Occur in familial hypercholesterolemia (type 11a hyperlipidemia) extreme increase in LDL levels

Eruptive xanthoma (most common)

- Pinhead sized asymptomatic yellow papules with a reddish, base, usually fleeting in nature and appear in crops
- Sites – buttocks, shoulders and extensor surface of extremities
- Occasionally these papules may coalesce and overlie a tuberous xanthoma – tuberoeruptive xanthomas
- Associated with pure of mixed hypertriglyceridemia and a high concentration of VLDL or chylmicroma
- May occur in secondary hyperlipidermia of diabetes mellitus

Plane Xanthoma

- Yellow – orange macules or slightly palpable plaques
- May occur at any site
- Plane xanthomas over palmar creases – 'xanthma palmariset striata' - pathognomonic of Type III dysbetalipoproteinemia

Intertriginous xanthomas

- They appear as flat to slightly yellow dermal plaques with corrugated surface within or adjacent webs, axillae buttocks and anetecubital and popliteal fossa
- They are pathognomonic of type II hypercholestrolemia

Generalized plane xanthomas

- These cover larger areas of the face, neck and thorax and also may involved flexures and palms
- May be associated with myeloma, macroglobulinermia or lymphoma rarely with normal plasma lipids
- 50% of patients may have hypolipidemia with low LDL levels

Cerebrotendinous xanthomas

- Rare autosomal recessive disorder with xanthomas in the tendons and the brain

- Defective conversion of cholesterol to bile acids with accumulation of cholesterol
- Severe neurologic disease and tendency to coronary artery disease
- Tendon xanthomas
- Treated with oral deoxycholic acid to replace the bile acid pool

Pellagra

- Pellagra is a nutritional disorder that occurs due to niacin deficiency. The term pellagra is derived from the Italian words 'pelle agra' meaning rough skin
- It is still endemic in areas of Africa and Asia due to poor nutrition and intake of certain cereals such as a maize and jowar (Indian millet) as staple diet
- In the present day context, in western world, pellagra is confined to individuals who have improper food intake such as psychiatry patients, alcoholics and recluses
- Pellagra is a clinical syndrome characterized by symmetrical photosensitive skin eruption gastrointestinal manifestations neurological and psychiatric disturbances. These well known group of symptoms are traditionally remembered as pellagra's four D's – dermatitis – diarrhea – dementia and when untreated, death – is very seldom seen. But most of the manifestations are borderline and/or less typical in nature
- The initial manifestation is an erythematous, photosensitive pruritic rash that occurs on the dorsa of hands
- The usual sites affected are the face, neck and dorsal surfaces of hands, arms and feet
- The dorsa of the hands are the most frequent site from where it may extend upward to form the 'glove' or 'gauntlet' of pellagra. The dermatosis is strikingly symmetrical and clearly demarcated from the normal skin
- The feet is commonly involved and it may also affect the front and back of the leg to form a boot
- In the face, and erythematous rash extending from the nose to the cheeks, chins, lips, may resemble lupus erythematosus "Butterfly rash". Rarely eyelids and ears may be affected. Facial rash usually occurs concurrently with lesions elsewhere.
- This eruption forms a broadband or collar around the neck, known as Casal's 'necklace'. In many instance, the necklace has an anterior continuation, also known as 'Cravat'

Acrodermatitis enteropathica

- Acrodermatitis eneteropathica, an autosomal recessive disorder which appears to be due to defective absorption of zinc from the gastrointestinal tract
- It may be a presenting sign in cystic fibrosis or AIDS
- It manifests insidiously between the ages three weeks and 18 months (often when the baby is switched from breast milk to cow's milk) with periorificial (mouth, nose, eyes, ears, and perineum) and acral (extensor surfaces of the major joints, fingers, and toes) dermatitis, alopecia and diarrhoea (Mnemonic DAD to remember its clinical features
- The primary cutaneous eruption is vesicobullous, which is symmetrical and grouped. The lesions soon evolve into erosive vesicobullous eruption or psoriasiform patches
- At the same time or shortly afterward, loss of hair and gastrointestinal disturbances manifested chiefly by diarrhoea, occur
- Mental depression, listlessness, loss of appetite, perleche and blepharitis may occur during exacerbations

- Laboratory verification of deficient plasma or serum zinc levels may be undertaken where facilities exist, otherwise, all these cases respond to zinc sulphate / gluconate (1 to 2 mg / kg body weight / day) given once or twice daily.

Pseudoxanthoma elasticum;

- Abnormal deposition of calcium on elastic fibers of the skin, eye and blood vessels.
- Skin involvement is flexural area ,neck ,axilla,anticubital fossa,and inguinal area.
- Yellow papules coalesce to form reticulated plaques of having appearance of plucked chicken skin.
- Angiod streaks are calcium deposits in bruchs membrane of eye.
- Few drugs can also cause eg, D-penicillamine.

Chapter 10

BENIGN, PREMALIGNANT AND MALIGNANT TUMOURS OF THE SKIN

Skin tumours can be broadly classified into various types based on cell of origin. Broadly they can be classified as benign, premalignant tumours. Some of these common cutaneous tumours are discussed in this chapter.

Benign Skin Tumours

Seborrhoeic keratosis (senile wart, senile keratosis, seborrheic verruca, basal cell papilloma)

- A benign tumor, more common in the elderly people
- Seborrhoeic keratosis (SK) occur on any body site, most frequent on the face and the upper trunk
- Seborrheic keratoses typically begin as flat, sharply demarcated, brown macules. Follicular prominence is one of the hallmarks of seborrheic keratoses.
- Later on, typical asymptomatic, slowly increasing, verrucous plaque develops and have a "stuck-on" appearance
- Surface of SK have loosely adherent greasy keratinous scales on the surface
- Sometimes, sudden eruptive lesions appear which may be due to underlying malignancy. Then it is called 'Leser-Trelat sign'
- Classical SK show feature of hyperkeratosis and numerous horn cysts in histology
- Treatment- curettage, cryotherapy or electrodessication

Naevi

- The word naevus is derived form the Latin term meaning spot or blemish, originally used to describe the congenital lesion or birth mark (mother's mark)
- In modern usage, it denotes a cutaneous hamartoma or benign proliferation of cells
- Naevi can be broadly classified into various type according to the predominant cell type
- The various types are keratinocyte naevi (. 1), follicular naevi, sebaceous naevi, apocrine naevi, eccrine naevi, connective tissue naevi, smooth muscle neavi, elastic naevi, and vascular naevi

Melanocytic Naevi

- They are benign tumours derived from melanocytes. They are broadly classified into acquired or congenital
- Acquired melanocytic naevi are subdivided into junctional, compound and dermal

- They begin as a proliferative naevus cells along the dermal-epideramal junction (forming a junctional naevus)
- With continued proliferation, they extend form the dermal- epidermal junction into the dermis (forming a compound naevus)
- The junctional component of the melanocytic naevus may resolve leaving only an intradermal component (Intradermal naevus)
- Acquired melanocytic naevi may resolve spontaneously
- Congenital melanocytic naevus may be defined as melanocytic naevi present at birth
- Those measuring more than 20 cm in greatest deameter are referred to as Giant congenital melanocytic naevi or bathing trunk naevi
- Treatment: surgical excision

Mongolian Spots

- Type of dermal naevus, characterized by macular blue grey pigmentation present at birth on the sacral area in normal infants

C/F – Slate blue to grey, diffuse pigmentation, rounded to oval patch up to 10 cm or so in diameter
- Usually single
- Lumbosacral region is the commonest site

Treatment – Disappear during first decade

Nevus of Ota – Dermal Naevus
- Characterized by bluish, pigmentation of the skin adjacent to eye, eyelids, bulbur & palpabral conjunctiva, cheek forehead, scalp, ears
- Mucosa of palate may be involved
- Step like deformity of occiput can be seen

Nevus of ITO – Dermal Nerves, it involves acrimioclavicular region & the upper chest
Treatment – Laser, Argon laser 585 NM

Beckers Nevus- also known as pigmented hairy epidermal naeves
- commonly seen in adolescence,may be present in childhood
- common sites are shoulder, anterior chest & scapular region
- pigmented large patches are seen with hair
- associated abnormalities are scoliosis, spina bifida, ,unilateral hypoplasia of breast
- remains indefinitely
- may be treated with q switched ruby laser

Vascular Naevi

Infantile Haemangioma- Commonest tumour of infancy, benign developmental vascular tumour
- Increased incidence in preterm, and decreased wt baby
- 90% appear during first months of life
- can be divided into superficial, mixed, and deep type
- superficial one is known as strawberry haemangioma
- strawberry haemangioma are sharply circumscribed oval or round, soft, domed swelling of intense scarlet red colour, surface may be smooth or lobulated
- most common site is head and neck
- Deep haemangioma is soft, warm, round bluish masses beneath normal skin with telangiectasia some times, known as' bag of worms'.
- Virtually 100% of infantile haemangiomas undergo spontaneous regression

Complications- most common is ulceration,

Treatment- Only for complicating haemagiomas
Treatment of choice is steroids
Laser, surgical excision, cryotherapy, vincristine,interferon α

Capillary vascular malformations

- **Salmon patch** (stroke bite, angel's kiss)
- Autosomal dominant, histologically no abnormality, only subpapillary capillaries dilatation
- Clinically lesion is observed in neonatal period, irregular dull pinkish red, macular area,often featuring fine, linear telangiectasia.
- Most common site is nape of neck, other sites are glabella, forehead, upper eyelids, tip of nose
- Facial lesion disappear within a year, nuchal may remain unchanged in 50% of cases

Portwine stain Almost always present at birth

- Face is most common site, followed by upper trunk, although lesion can occur at any site
- Macular lesion can vary from few mm to many cm, colour may vary from pale pink to deep red or purple
- Associated eye abnormalities (glaucoma), & brain abnormalities occur
- Surface area remain unchanged
- Can be treated by pulse dye lasers effectively.
    - **Struge weber syndrome -** Sturge-Weber syndrome (SWS) is defined as facial portwine stain in association with ipsilateral plial (ie. leptomeningeal) vascular anomalies (with one or more symptoms; epilepsy early in life, hemiparesis or hemiplegia, gyriform intracranial calcifications and cerebral atrophy) and inconstant ipsilateral choroidal vascular lesions with glaucoma.
    - Portwine stains (naevus flammeus) are congenital vascular bithmarks that are present at birth and persist into adulthood. At birth, they are often pale pink macular lesions which with time, progress to become dark red to purple. and even nodular. These changes occur as a result of progressive ectasia of cutaneous superficial vascular plexus.
    - Portwine stains can either occur as isolated cutaneous or be associated with structural abnormalities especially of those underlying the birth mark such as the choroidal vessels in the eye which produce glaucoma and leptomeningeal vessels in the brain which causes seizures, then is known as SWS.

Skin tags (soft warts; Acrochordons)

- Common benign lesion, occurs on the neck, axilla and groin
- The lesions are round, soft, pedunculated connected to the skin by a narrow pedicle**.** They very in size form 1 cm long. (. 2)
- The skin tags are of three types which include multiple small furrowed papules (1-2 mm long), single or multiple filiform smooth growths (2-5 mm) and solitary baglike-pedunculated growth (1 cm)
- Histopathologically skin tags consist of loose fibrous tissue covered by folded skin
- They have been found in association with colonic polyps, diabetes and acromegaly
- Simple snipping, electrocautery and cryotherapy are effective

Pyogenic granuloma (Granuloma pyogenicum)

- They are smooth surfaced, bright red, friable, sessile or pedunculated lesions of exuberant granulation tissue with a pale epidermal collarette around the session (. 3)
- Occurs following a minor injury of infection of the skin
- They most often affects children or young adults
- The hands, fingers and face especially the lips and gums are the most common sites
- The lesion once developed may persist indefinitely unless destroyed. It may occur in pregnancy in gingival-called as **"**Epulis Gravidarum**"** or "Pregnancy tymour"
- Differential diagnosis include Kaposi's Sarcoma and bacillary angiomatosis
- Treatment: excision and electrofulgration

MILIA

- They are tiny, white, globoid cysts that commonly occur on the face around eyes
- Primary milia represent a keratinizing benign tumour. They arise spontaneously on the face in the predisposed individuals
- Secondary milia is a type of retention cyst that arises due to damage to the epithelium and occurs in diseases like bullous pemphigoid, porphyria cutanea tarda and others following trauma
- Treatment: Deroofing with hypodermic needle, trichloroacetic acid cautery or electrocautery

Trichoepithelioma

- Trichoepithelioma is benign appendageal tumour with follicular differentiation
- They appear at puberty as a solitary or multiple skin colored, translucent, rounded nodules on the face (. 4)
- The lesions are distributed predominantly in the nasolabial folds and eyelids
- A few telangiectatic vessels are often present on the surface of the large lesions, which resemble basal cell carcinoma
- Treatment with diathermy produce good results

Syringoma

- Benign tumours of eccrine differentiation
- More common in females
- Clinically lesions are multiple, skin coloured, 1-3 mm sized, angular papules (due to, numerous small cystic ducts , as well as solid epithelial strands in the upper dermis and middermis) distributed bilateral summetrically, most commonly on the lower eyelids, less commonly over the chest and neck
- Treatment with diathermy produce good results

Hypertrophic scar

- Injury or surgery in a predisposed individual can result in an abnormally large scar called as hypertrophic scar
- A hypertrophic scar represents excessive collagen deposition at the site of wound healing

- Typically, hypertrophic scar starts as an asymptomatic erythematous smooth firm, scar seen at anatomic locations characterized by high tensions. With time, they flatten and become white in colour.
- Hypertrophic scars do not extend beyond the limits of the original trauma and heal by 6 months

Keloids

- Keloids represent exaggerated collagen deposition at the site of wound healing
- They frequently porliferate beyond the wound margins onto the normal adjacent skin
- A keloid appears as a firm, mildly tender, boddelated tumor present at a site of previous injury. They are commonly pruritic, erythematous, indurated lesions that show extensions like claws of a crab. They may even be the source of significant discomfort of pain
- They rarely undergo involution
- Treatment: Medical – topical steroids, intralesional steroids and Silicone Gel dressings. Surgical – Surgical excision, cryosurgery and skin grafts.

Dermatofibroma

- Most common benign dermal fibrous tumor
- Typical dermatofibromas appear as skin coloured to red-brown firm tender nodule (s), most commonly seen on the extremities
- Lateral compression of the lesion with fingers results in the depression on the top-called 'dimple sign'
- Histologically the fibroblasts and collagen bundles are arranged in a storiform or cartwheel pattern
- Treatment of choice-simple excision

Glomus Tumour

- This arises within the glomus body, a neuromyoarterial receptor (the Sucquet-Hoyer canal) that is sensitive to temperature variations and regulates arterial blood flow.
- These tumors, more common on the fingers and toes and beneath the nail plate.
- Usually seen in young adults between the third and fourth decade of life.
- They can be solitary of multiple
- Classically presents as solitary, small, blue – red nodules on the hand (nail bed) that are characteristically associated with paroxysmal pain often elicited by changes in temperature
- Simple excision – treatment of choice

Premalignant Epidermal Tumours

Actinic keratosis (senile or solar keratosis)

- Most common premalignant skin tumour

- These lesions occur in sun-damaged skin of elderly people having light complexion
- Clinically, these lesions are rounds to irregular keratotic papules surrounded by erythema
- The principal sites are the back of the hands, forearm and face
- Squamous cell carcinoma can develop from actinic keratosis
- Histologically there may be vacuolization of keratinocytes with munerous mitotic ures seen involving the lower layers of the epidermis (carcinoma in situ)
- Treatment medical – topical tretinoin and topical 5 flurouracil and surgical – curettage, electrodessication and cryotherapy

Erythroplasia of Queyrat

- This condition affect uncircumscised males
- Seen in the fifth and sixth decades of life
- The lesions presents as sharply defined brightly erythematous and velvety plaque with moist glistening or granular surface over the glans penis
- Differentiated from benign inflammatory dermatoses such as psoriasis, lichen planus, Zoon's plasma cell balanitis and fixed drug eruptions
- Treatment with topical 5- fluorouracil produces satisfactory results

Bowen's Disease

- Refers to cutaneous plaques of intraepidermal squamous cell carcinoma
- Chronic sunlight exposure, inorganic arsenicals are important etiologic factors
- Clinically lesions of Bowen's disease appear as solitary, sharply defined, round or oval to irregular erythematous psoriasiform or eczematous plaque
- Ulceration is a sign of development of invasive carcinoma
- Histology shows proliferating atypical squamous cells through the full thickness of the epidermis ("wind – blown appearance")
- The most effective treatment for Bowen's disease is surgical excision

MALIGNANT TUMOURS OF THE SKIN

BASAL CELL CARCINOMA (BCC) (RODENT ULCER) Basal cell carcinoma → (Rodent ulcer)

- Most common skin tumor
- A malignant tumor which rarely metastasizes
- This malignant tumour is locally invasive,aggressive,and destructive.
- It is composed of Basal area of Epidermis & the appendages

Age of onset > 40 yrs

Sex M>F

Predisposing Factors

- Exposure to sunlight

- White skinned people
- Skin burn ionizing radiation
- Burn scars, vaccination scars
- Aresenic salts

Physical Examination

Types

- Rodent type – Nodular – M/C 75%
- Morphoic or Sclerodermform – Least common 29%
- Superficial – 10%
- Pigmented
- Metaphysical – Histological subtype with squamous differentiation

Distribution

- Most common site is inner canthus of orbit, other sites are lateral canthi,nasolabial fold.
- Isolated single lesion,multiple lesions infrequent.

Management

- Surgery is treatment of choice
- Radiotherapy for elderly pt
- Morphoeic are radioresistant
- Cytotoxic drugs – Flurouracil
- For small & superficial lesions

MYCOSIS FUNGOIDES

Mycosis fungoides is a form of Cutaneous T-cell Lymphoma (CTCL)

- It is a chronic, slowly progressive disease that evolves form patches (Patch stage) to plaques (plaque stage) and subsequently nodules (tumour stage).
- Pruritus is a prominent symptom.
- The lesions coalesce and may ulcerate, leading to deep ulcers.
- Prognosis depends upon the TNM staging
- Diagnosis: Clinically lesions can be confused with eczema and psoriasis. Histopathology reveals atypical lymphocytes infiltrating the epidermis without spongiosis (epidermotropism). The pathognomonic feature is presence of Pautrier microabscess (collection of atypical lymphocytes in the epidermis). The dermis has dense monomorphous lyphomononuclear infiltrate with grenz zone.
- Treatment: it depends on the stage of the disease. Chemotherapy, retinoids, electron beam therapy, photochemotherapy etc have been used.

Paget's disease

- It is non squamous intraepithelial Neoplasia
- Mammary & Extramammary forms exist, may be cutaneous marker for underlying malignancy
- Paget's cells are ductal carcinoma cells that have migrated along the basement membrane to epidermis

- Mammary PD is the presenting sign of breast cancer in 0.5% to 4.3% of patients
- Extramamary PD is most common on vulva, followed by genital & axillary regions
- Pruritis, burning, pain & tenderness are early & prominent symptoms of PD
- Pagets cells are large ovoid or round cells with large nucleoli, pale cytoplasm & enlarged hyper chromatic nuclei

Squamous cell carcinoma - Malignant tumor arising from Keratinocytes of epidermis

Predisposing Factors

- Sun exposure
- Scar marks
- Chronic granuloma

M/C for squamous carcinoma are those most exposed to the sun – Back of the hands, forearm, upper part of face lip & pinna

- first clinical evidence of malignancy is induration
- Area may be plague,verrucous, tumid or ulcerated
- Seen in lesions of solar keratosis, Leucoplakia, Bowen's disease, chronic ulcers

Treatment – Surgery

- Local destruction – Currettage, cryotherapy
- Radiotherapy – dorsum of hand should not be treated with radiotherapy

Malignant melanoma – A malignant tumor arising from the epidermal melanocytes

- Presence of precursor lesions, Congenital melanocytic Nevi > 20 cms
- Excessive sun exposure (in early life <14 yrs)
- Individuals having history of blistering disease or severe, sunburns during childhood has increased risk
- Numerous moles, Family history, PUVA treatment history
- Light skin color
- Family history in parents, siblings or children.

Types Superficial spreading or pagetoid melanoma is M/C

- Nodular
- Lentigo maligna melanoma is least common
- Acral Lentigenous
- Amelanotic melanoma

Diagnosis

- Ultimate diagnosis depends on biopsy

Management

- Surgical excision remains the mainstay of treatment for cutaneous melanoma
- Mohes micrographic surgery treatment of choice for Lentigo maligna melanoma
- Also treatment of choice for other type of Melanoma of Head & Neck

- For in situ melanomas, it has been recommended that a 5 mm rim of clinically normal skin be excised with the lesion
- For invasive lesion 1 mm thick or less, if feasible margin of 1 cm is adequate
- Sentinal lymph node biopsy if lesion is > 1 mm thick

Prognostic Variables

- Breslow thickness index is the most important criteria
- Amelanocytic melanoma is most dangerous
- Thickness < 0.75 mm excellent – prognosis with cure rate of 99%
- Premenopausal better the male counter part
- Lesions on extremities better prognosis

Adjuvant Therapy

1. High dose interferon alpha 2b for 1 year
2. Disseminated melanoma – Dacarbazine

Chapter-11

CONNECTIVE TISSUE DISORDERS

Connective Tissue Disorders

- Connective tissue disorders are multisystem disorder with prominent cutaneous manifestation. They are systemic lupus erythematosus, systemic sclerosis, dermatomyosistis, overlap- syndrome and mixed connective tissue disease.

Lupus Erythematosus

- Lupus erythematosus is the designation of a spectrum of diseases that are linked by distinct clinical findings and distinct patterns of polyclonal B cell immunity.
- It can be decided into – DLE, SCLE, & SLE

DLE – Discoid lupus Erythematosus – it is the most common type of LE involving only cutaneous structures

(1) Commoner than SLE
(2) Sun exposure plays an important role, other precipitating factors are stress, trauma, infections & pregnancy
(3) Drugs – INH, penicillamine, griesofulvin, Dapsone

Hislopath

1. Liquifaction degeneration of basal cell layer
2. Degenerative changes in connective tissue, consists of hyalinization, oedema & fibrinoid changes

3. A patchy dermal lymphocyte infiltrate particularly around appendages
- At least two features should be present for the diagnosis

C/F – Skin lesions mainly on exposed parts of body (face & neck), well defined erythematous patch or plaque with adherent scales & when scales is removed its under surface shows horny plugs known as tin tack sign.
- Other features are follicular plugging, telangiectasia, atrophy scaring & pigmentary changes
- DLE to SLE conversion rate is 1.4 to 5%
- Drug of choice is chloroquinine
- Retinoids clofazimine, Dapsone, methotrexate can also be given

Subacute lupus erythematosus (SCLE)

- Characterized by scaly papules on the shoulders, extensor surfaces of the upper extremities, upper chest, upper back and neck in widespread and symmetric fashion
- Above lesions evolve into two morphological types either into papulosquamous or annular and polycyclic lesions
- All patients with SCLE have mild systemic complaints and 50% of the patients fulfill the criteria for the diagnosis of SLE
- SCLE patients have antibodies to the cellular antigens Ro/SS-A and La/SS – B

Systemic Lupus Erythemalosus → When lupus erythematosus is associated with multiple systems of the body it is known as SLE

Pathology – Same as DLE

- **Aetiology** – Genetic factors → 65% concordance rate in identical twins, It has been postuled that four or more genes are involved in predisposing an individual to SLE

2. Autoantibodies – Non organ specific humoral auto antibodies are hall mark of SLE.
   (a) Antinuclar antibody (Anti SS DNA) is most sensitive
   (b) Anti ds DNA & anti Sm are most specific
3. UV radiation plays an important role, about 70% patients of SLE are photosensitive
   UVB light Exacerbates the lesion

- Drugs – Penicillin, Phenytoin, practolol, Hydralazine, INH

C/F – Females > Males, Particularly child bearing age

- Most common manifestations are fever, malaise, fatique & myalgia / arthalgia
- Most common skin manifestation is DLE like lesions
- Malar rash is characteristic , Photosensitive & scaring is absent
- Endocarditis in SLE is Libman sacks verrucous type, Loss of Hair in scalp is diffuse non scarring but not in DLE
- LE cell is seen in the over 80% patients, it is a PMN leukocyte
- Le cell factor – an antibody to Deoxyribonucleoprotein

The 1982 revised criteria for diagnosis of SLE are

1. Malar rash
2. Discoid rash
3. Photosensitivity
4. Oral or nasophageal ulceration
5. Arthritis – nonerosive or two or more peripheral joints
6. Serositis: pleuritis or pericarditis

7. Renal disorders: Persistent proteinuria (>0.5 gm/day or > 3+), cellular casts (RBC, granular, tubular or mixed)
8. Neurological disorders: seizure or psychosis
9. Haematological disorders: Hemolytic anemia with reticulocytosis or Leukopenia (<4000/mm^3 on two or more occasion), or Lymphopenia (<1500/mm^3 on two or more occasion) or Thrombocytopenia (<1,00,000/mm^3)
10. Immunological disorder; Positive LE cell phenomenon, or Anti-DNA: antibody to native DNA (nDNA) in abnormal titer, or Anti-Sm: presence of antibody to Sm nuclear antigen or False positive serologic test for syphilis for at least six months and confirmed by TPI or FTA – ABS test
11. ANA in FTA – ABS test

NOTE: A patient is said to have SLE if four or more criteria are satisfied, serially or simultaneously

Chief cutaneous features

- Butterfly rash
- Photosensitivity
- Raynaud's phenomenon
- Non-scarring alopecia
- Urticarial vasculitis
- Mouth ulceration
- Chronic discoid LE lesion
- Cutaneous vasculitis

Investigation

- Complete blood count, ESR
- Urine analysis for microscopic Hematuria
- Skin biopsy
- LE cell test to demonstrate LE cell (a neutrophil containing engulfed nuclear material) or rosette phenomenon (neutrophils surrounding nuclear debris, trying to engulf it)
- Lupus band test
- C3, C4, CH50 levels
- ANA (Commonest pattern is homogeneous; peripheral pattern predictor of renal involvement)
- nDNA
- Antibodies – SSA (Ro), SSB (La), Sm, nRNP
- **Treatment**

SLE with only cutaneous lesions and arthritis

- Photoprotection
- NSAID's, Antimalarials, prednisolone

Severe disease with end-organ prednisolone

- Steroid pulse therapy
- Immunosuppressants such as azathioprine, cyclophosphamide methotrexate, chlorambucil and cyclosporine

Scleroderma

- Disease of unknown cause in which sclerosis of skin occurs. If other systems are also involved known as systemic sclerosis
- Scleroderma can be divided into two types

Circumscribed

- Morphea

Systemic

- Progressive systemic sclerosis
- CREST syndrome (Thibierge – Weissenbach syndrome)

Morphea

Aetiology → Cause is unknown, autoimmune.

Factors → (a) infections with Borrelia bergdoferi which causes acrodermatitis chronica atrophicans
(b) BCG vaccination, injections of Vit K, following varicella infection
(c) Penicillamine therapy, Bromocriptine

Histopath – markedly thickened dermis, with dense collagen cutaneous layer is replaced by hyalinized tissue

Localised morphea

- Most common form of morphea
- Occurs mot commonly in females than males and primarily in young adults
- Seen commonly on the trunk
- These lesions of morphea may begin as erythematous macule, evolve into ivory-colored centers and violaceous bordered plaque
- Lesions slowly involute over 3 to 5 years period leaving permanent atrophic skin or normal appearing skin behind

Generalized morphea

- Lesions are more numerous and larger
- Often coalesce to involve extensive portions of the body
- Muscle atrophy may be associated

Pansclerotic morphea (morphea profunda)

- Sclerosis involves dermis, panniculus, fascia, muscle and bones
- There is disabling limitation of the joints

En Coup De Sabre

- It is variant of linear scleroderma involving scalp parasagitally on frontal scalp and forehead
- Often has the configuration of the stroke of a saber (en coup de sabre)

Treatment

- Topical steroid, intralesional steroids and chloroquine

Progressive systemic sclerosis

- It is characterized by cutaneous and internal organ fibrosis, Raynaud's phenomenon is the earliest feature and may precede the onset of disease by months
- Riant is called CREST syndrome (Calcinosis, Raynaud's phenomenon, Esophageal dysfunction, Sclerodactyly and Telangiectasis)

American Rheumatism Association Criteria

Major

- Sclroderma proximal to the digits, affecting limbs, face, neck and trunk

Minor

- Sclerodactyly
- Digital pitted scarring
- Bilateral basal pulmonary fibrosis

One major criterion or two or more criteria suggest the diagnosis of systemic sclerosis
Note: These criteria have 97% sensitivity and 98% specificity

Cutaneous manifestations

Hands and Feet

- Early: Raynaud's phenomenon
- Painful ulceration at fingertips with pitted scars
- **Late**: sclerodactyly (induration of skin over the fingers) with tapering of fingers
- Skin is tightly bound down
- Leathery crepitations over joints and flexion contractures
- Periungual telangiectasia
- Bony resorption

Face

- Periobital edema is the early manifestation
- Late manifestations include: mask like facies, thining of lips, microstomia, radial perioral furrowing, small sharp nose, telangiectasia and diffuse hyperpigmentation

Trunk

- Early: tense, stiff and waxy appearing skin that cannot be pinched and folded
- Late: impairment of respiratory movement of chest wall and of joint mobility

Other changes: "salt and pepper" pigmentation, gangrene of fingers, mat like telangiectasia, leg ulcers and livido reticularis

Organ involvement in PSS

- Esophageal fibrosis, pulmonary interstitial fibrosis, myocardial fibrosis, small intestinal fibrosis, large intestinal fibrosis, renal involvement, skeletal muscle atrophy and thyroid fibrosis

Investigation

- Skin biopsy
- Nail fold capillary microscopy
- ANA, Ab-SSA, SSB, Sm, nRNP, Scl-70 (specific for diffuse systemic sclerosis), anticentromere antibody (specific for CREST syndrome)
- Organ workup: urine analysis, barium swallow, esophageal manomerty, barium enema, chest x-ray and pulmonary function test
- Prognosis and cause of death
- Course of the disease is variable. Death occurs from intercurrent infection, hypertension and perforation of the gastrointestinal tract

Other conditions where sclerodermoid changes are seen

- Phenylketonuria, progeria, Rothmund – Thomson syndrome. Werner's syndrome, porphyria cutanea tarda, primary systemic amyloidosis, Hashimoto's disease, carcinoid syndrome, childhood diabetes mellitus and drugs(bleomycin, pentazocine, carbidopa, and 5-hydroxytryptophan), Chronic gravitalional oedema & chronic scurvy, Occupational sclerodema – Vinylchinde & Pesticides

Treatment

- Primarily directed towards complications. Pharmacological agents that used for systemic sclerosis can be grouped into various categories
- **Collagen modulators**: D – penicillamine, relaxins, and interferons
- Vasoactive agents: captopril, infedipine and pentoxifylline
- Immunosupprissive agents: azathioprine, cyclophosphamide, cycloporine and methotrexate

Dermatomyositis

Definitions – A systemic disease mainly involving skin, muscle & bloods vessels.
Characteristics erythematous & oedematous changes in skin are associated muscle weakness & inflammation

Aetiology – Mainly unknown, with speculations
Autoimmune (Humorally mediated), HLA – B8, & DR – 3
↑ Titre of antiendothelial cell antibodies

Other factors: Infection with Toxoplasma gondi, staph & Strep
Penicillamine therapy, tamoxifen therapy
Heavy exertion

Clinical features Most common complaint is aching & weakness of proximal group of muscle except ocular muscles

- Typical purple, red discolouration of upper eyelids, sometime associated with scaling & periorbital oedema
- Rash is known (heliotrope sign)
- Small, erythematous or violaceaceus, flat papules over the dorsa of distal interphalangeal joints known as gottron papules which is **pathognomic.**
- (Area of Hypo or hyperpigmentation, telangectasia & atrophy) known poikiloderma vascular atrophicans is characteristic lesion.
- Flagellate Erythema – Zebra skin like erythema
- Raynaud's phenomenor & sclerodactly may be present
- Associated malignant tumours; breast,lung,ovary,stomach etc

Diagnostics – Clinical Features
↑ CPK Enzymes; ↑ urine creatine
Electromyography
Treatment-, corticosteroids, Azathioprine, Immunoglobulin, & methotrexate

→ Calicinosis is good prognostic indicator

Overlap syndrome

- The term overlap syndrome may be used when patients exhibit symptoms of more than one connective tissue disease
- Such patients may meet diagnostic criteria for one disease but also have atypical manifestations or findings suggestive of second diagnosis
- Systemic sclerosis combined with dermatomyositis is the most frequently seen overlap syndrome

Mixed connective tissue disease

- This entity was first described by sharp and colleagues
- These patients, predominantly female, show features of SLE, systemic sclerosis, dermatomyositis and polymyositis
- All patients have high titer of antibody to U1 RNP (ribouncleoprotein)
- Prominent clinical features include myositis, pulmonary hypertension, Raynaud's phenomenon, oesophageal hypomobility, swollen hands and sclerodactyly

Sjogren's syndrome (SS)

- Sjogern in 1933 described a triad of keratoconjunctivitis sicca, xerostomia and rheumatoid arthritis
- Dry eyes and dry mouth occur in primary Sjogren's syndrome or if associated with other connective tissue disease then referred to as secondary Sjogren's syndrome
- Most patients are aged 50 years or older and are women
- Clinical feature include xerostomia, rhinitis sicca, vaginal dryness and dry eyes
- Skin manifestations of SS include vasculitis, xerosis and annular erythema
- Rheumatoid factor is usually positive
- 80% of patients have anti Ro/SSA antibodies
- Increased risk of developing lymphoreticular malignancies
- No specific treatments available, only symptomatic management

Lichen sclerosus atrophicus (LSA)

- It is chronic disease of the skin and mucous membrane of unknown origin predominantly affecting the females
- Early lesions of LSA ivory white, polygonal, flat-topped papules or plaques with follicular plugs (delling). The lesions may coalesce into large atrophic plaques
- In women, involvement of the vulvar and peranal areas leads to the typical "figure of eight" or "hour glass" appearance
- LSA of the penis in adults (Balanitis xerotica obliterans) presents with acquired phimosis or recurrent balanitis.
- LSA of vulva (Kraurosis vulvae) usually seen in postmenopausal women
- LSA of the genitalia have increased risk for squamous cell carcinoma in women

- Treatment: Medical – Topical steroids, topical testosterone, topical tretinoin
  Surgical correction of adhesions may be required

Chapter 12

PIGMENTARY DISORDERS

PIGMENTARY DISORDERS

Pigmentary disorders may be, hypomelanotic (Vitiligo, albinism, peibaldism, Waardenburg's syndrome) or hypermelanotic (Melasma, freckles, lentigo, and Peutz Jeghers syndrome). In this chapter, only the common ones are discussed

Vitiligo

- Vitiligo is defined as a common, dermatological disorder characterized by well circumscribed, milky-white cutaneous macules devoid of identifiable melanocytes. Probably derived from the Latin word "vitium ("blemish")

Pathogenesis

- The white macules of vitiligo are the result of loss of melanocytes. The mechanism(s) by which the melanocytes are lost may be multiple but have not been identified unequivocally. Four hypotheses, not mutually exclusive, have been proposed to explain the causation of vitiligo:-
  - **Autoimmume :** Strengthned by the demonstation of specific autoantibodies to melanocyte cell surface antigens and the association of vitiligo with a variety of autoimmne disorders
  - **Autocytotoxic:** Also called as the self-destruction theroy, it proposes melanocyte destruction by intracellular retention of various precursor of melanin synthesis
  - **Neural:** Especially proposed to explain the segmental type of vitiligo
  - **Biochemical:** Accumulation of pteridines (6-biopterin and 7-biopterin) in the vitiliginous skin causes the depigmentation
  - **Intrinsic (genetic) theory:** An underlying genetic intrinsic factor predisposes some individuals to be more prone to develop vitiligo
  - **Cosmetic vitiligo** caused mainly by adhesives may be in bindi containing para tetra butyl phenol or may be catechol by killing melanocytes, can only be diagnosed by **history and examination**.

Clinical features

- The diagnosis lesion of vitiligo is the typical vitiligo macule, which is of variable size, round / oval in shape, has a milky white color and scalloped margins
- May appear at any age, however, the peak age at onset has been reported to be five to thirty years
- Prevalence is the same in both sexes

- The natural course of the disease is of progression, the lesions increasing both in number and size. In some cases there may be a rapid downhill course of vitiligo and this has been termed ‘galloping vitiligo’ or ‘vitiligo fulminans’.
- Segmental vitiligo and vitiligo in children have a better prognosis
- Mucous membrane involvement is also noted in vitiligo and is commoner, or rather, easily detectable in dark-skinned races
- Leukotricha refers to depigmentation of the hair and may occur in some patients

Classification of Vitiligo

Localized

- Focal vitiligo – This consists of one or more macules in one area but not clearly in a segmental or zosteriform distribution
- Segmental vitiligo – Number of macules involving a unilateral segment of the body. The lesions stop abruptly and the midline of the affected segment
- Mucosal vitiligo – Vitiligo affecting mucus membranes of the lips, oral cavity or the genitalia

Generalized

- Acrofacial vitiligo – Lesions on the acral areas (hands and feet) and on the face, very often the perioral areas
- Vitiligo vulgaris – Multiple macules of variable sizes over widely scattered areas often tending to bilateral symmetry
- Lip – tip vitiligo – Lesions affecting tips of the digits and the lips
- Mixed – Any combination – of vitiligo vulgaris and acrofacial vitiligo or of vitiligo vulgaris with segmental vitiligo
- Universal Vitiligo – This is the term used to describe complete or near complete depigmenation

Special signs in vitiligo

- Trichome vitiligo: The trichrome sign, also termed ‘vitiligo gradata’ describes a tan coloured zone (intermediate colour) between the normal skin and the depigmented macules. ‘Quadrichrome vitiligo’ implies the presence of fourth colour – dark brown – at the sites of perifollicular repigmentation
- Koebner’s sign: This phenomenon, a common feature of vitiligo, is defined as the development of lesions along the lines of specific trauma such as a cut, burn or abrasion. It may be a marker for disease activity

Association of vitiligo with other disease

- Vitiligo has been shown to be associated with autoimmune thyroid disease, Addison’s disase, pernicious anaemia, diabetes mellitus and various dermatological disorder like alopecia areata, scleroderma, psoriasis and collagen vascular disorder. The **Vogt Koyangi Harada** syndrome is an apparently rare, multisystem disease characterized by vitiligo, poliosis, uveitis, dysacousia, and alopecia.

Treatment

Treatment of vitiligo can be broadly divided into medical and surgical modalities

Medical management

A. Systemic

- Psoralen (stimulates melanogenesis in presence or ultra violet radiation) UVA radiation (PUVA therapy)
- Corticosteroids (low dose twice weekly pushed dosing of oral dexamethazone is safe and reasonably effective)
- Immunomodulators (e.g. levamisole, cyclosporine, cyclophosphamide, azathioprine)
- Khellin (action similar to psoralens)
- Phenylalanine (+UVA)
- Antioxidants and nutritional supplements

B. Topical

1. Topical PUVA
2. Topical potent steroids
3. Human placental extract
4. Calcipotriol
5. Topical pseudocatalase + calcium + UVB
6. Cosemetic camouflage
7. Dipigmenation with 20% monobenzyl ether of hydroquinone (for islands of residual repigmenation in extensive vitligo)

Surgical Management

Indications

- Stable vitiligo (i.e. no new lesions for last one years)
- Refractory to medical management

Modalities

- Punch grafting
- Split skin thickness graft
- Blister grafting
- Melanocyte culture and transplantation
- Tattooing

Albinism

- Autosomal recessive inherited disorder
- It is characterized reduced melanin synthesis in the melanocytes of the skin, hair, and eyes, termed oculocutaneous albinism (OCA), and hypopigmentation primarily involving the retinal pigment epithelium of the eyes is fermed ocular albinism(OA)
- Due to genetic abnormalities of melanin synthesis associated with normal number and structure of melanocytes (differentiate it form vitiligo where melanocytes are reduced or absent)
- Tyrosinase – related OCA, the most common type of albinism is produced by loss of function of the melanocytic enzyme tyrosinase resulting from mutations of the tyrosinase gene
- Affected individuals are born with white or blond hair and skin and blue eyes

Piebaldism

- Piebaldism is an uncommon, autosomal dominant, congenital, stable leukoderma characterized by a white forelocak and vilitigo-like amelanotic macules, usually containing a few normally pigmented or hyperpigmented macules
- Hyperpigmented macules within the amelanotic macules and on normally pigmented skin are characteristic of piebaldism

Waardenburg's syndrome

- WS (Waardenburg syndrome) – Hirschsprung disease or Shab – Waardenburg syndrome) is rare autosomal dominant disorder that is characterized by
  - Lateral displacement of the inner canthi and of lacrimal puncta
  - Prominence of the nasal root and of the medial eyebrows
  - Congenital deafness
  - Heterochromic irides
  - White forelock
  - Hypomelanotic macules

Melasma (Chloasma)

- Melasma is a common acquired hypermelanosis that occurs exclusively in sun-exposed areas; it is exacerbated by sun exposure, pregnancy, oral contraceptives, and certain anti-epilepsy drugs
- Melasma presents in one of three usually symmetric facial patterns. The most common is a centrofacial pattern involving the cheeks, forehead, upper lip, nose, and chin. Less common are the malar pattern, involving the cheeks and nose, and the mandibular pattern.
- Successful treatment of melasma involves the triad of sunblocks, bleach and time

Freckle (Ephelis)

It is an area of pale brown pigmentation usually less than 3 mm with poorly defined lateral margins

- Freckle appears as result of functionally overactive melanocytes (through, they are normal in number)
- They are seen only in fair skinned people
- They are stimulated by ultra violet radiation and fade away during winter
- Histology reveals excess of melanin pigment in the basal layer

Lentigo (plural, lentigines)

- Letigo appears as a result of increased number of melanocytes in the basal layer
- They doe not show seasonal colour variations (not affected by ultra violet radiation)
- Histology reveals linear increases of melanocytes in the basal layer

Syndrome associated with lentigines

- LEOPARD syndrome – Lentigens (multiple), ECG abnormalities, ocular abnormalities (hypertelorism), Pulmonary stenosis, Abnormalities of genitaliam, Retardation of growth and Deafness (sensorineural)
- NAME syndrome – Nevi, Atrial myxoma, Myxoid neurofibromas and Ephelides
- LAMB syndrome – Lentigines, Atrial myxoma, Mucocutaneous myxomas and Blue nevi

Peutz Jeghers Syndrome

- Peutz – Jeghers syndrome is an autosomal dominant disorder characterized by pigmented macules (lentigines) of the buccal mucosa, lips, fingers and toes and by gastrointestinal polyps
- It is caused mutations in a novel serine threonine kinase, and its gene has recently been mapped to chromosome 19p
- The pigmented macules (dark blue-brown) are most common on the buccal mucosa and lips, but also seen over palate and tongue. The macules on the skin are usually found on the face (around the mouth eyes), dorsa of the hands and feet and periumbilically
- The diagnosis is particularly important because of the presence of gastrointestinal polyps, which are most frequent in the small bowel, particularly the jejunum, which may manifest with gastrointestinal bleeding. Malignant change may occur in these polyps
- Any child with recurrent, unexplained abdominal pain should be examined for the typical mucosal, and periorificial pigmented lesions of Petuz-Jeghers syndrome

Chapter 13

PHAKOMATOSES OR NEUROCUTANEOUS SYNDROMES

Phakomatoses or Neurocutaneous Syndromes

- These are a group of disorders including neurofibromatiosis, tuberous sclerosis, von Hippel-Lindau syndrome, and Sturge-Weber syndrome.

Neurofibromatosis Type 1 (NF-1)

- Neurofibromatosis type 1 (NF-1), also known as Von Recklinghausen's disease, classic neurofibromatosis, or peripheral neurofibromatsis is the most common form of neurofibromatosis.
- The clinical expression of NF-1 is highly variable. Roughly, half of NF-1 cases arise via spontaneous mutation and are not associated with any family history.
- NF-1 is a multisystem disorder characterized by café-au-lait macules (CALMs), neurofibromas, lisch nodules, optic gliomas, bony dysplasia, and intertriginous freckling and autosomal dominant inheritance.
- Neurofibromatosis is named after neurofibroma tumors. There are three types of neurofibromas: cutaneous, subcutaneous and plexiform. A single plexiform neurofibroma or two of any type are considered diagnostic of NF-1. These can be easily pushed into underlying dermal defect with light digital pressure- **"button holing"**. When pressed, the soft tumors tend to invaginate through a small opening in the subcutaneous tissue, giving the feeling of a seedless raisin or a scrotum without a testicle. The subcutaneous type may feel hard like a pencil eraser. They often cause localized pain or tenderness. On the other hand, plexiform neurofibromas are congenital and are pathognomonic for NF-1. They feel like a "bag of worms" because of the many interdigitating elements and can be thought of as combination of cutaneous and subcutaneous types. Neurofibromas of the female areola and nipple are virtually pathognomonic for NF-1.
- Café-au-lait macules (CALMs), another manifestation of NF-1, are discrete, well circumscribed, round or oval, uniformly pigmented patches (may be seen in normal population, segmental neurofibromatosis, familial CALMs, tuberous sclerosis, macune Albright syndrome, ataxia telangiectasia, bloom;s syndrome, Watson's syndrome,. Solitary CALMs are common findings, affecting up to one third of normal children. Multiple CALMs are rare, particularly in the white population. A diagnosis of multiple organ disorder, the most common being NF-1, should be considered in this instance. The minimal number of 6 lesions of CALMs was established as a criterion for the diagnosis of NF-1 (more than 1.5 cm in diameter in adults).
- Freckling is a useful and often overlooked sign of NF-1. Freckling involving areas of hyperpigmentation up to 2 or 3 mm in diameter occurs frequently in the axilla as well as other intertriginous regions. Basically, there are two kinds of neurofibromatiosis freckles-

those that are basically very small CALMs ordinarily present at birth or in the first year of life and distributed over the entire body and those that develop later in intertriginous regions (Crowe,s sign). Multiple melanotic macules of palms with varying size from 2mm to 4mm may be noted in 90% of Indian cases. This sign has been named as "Patrick Yesudian sign" by various medical schools in south India.

- Lisch nodules are pigmented iris harartomas which appear as dome shaped lesions on the surface of iris. They are one of the most common manifestations of NF-1 and have significant diagnostic value.
- Diagnosis- The spectrum of clinical findings in NF-1 is broad, but only six features constitute the seven established diagnostic criteria. Two criteria are required for a definitive diagnosis and one is required for a presumptive diagnosis. Three of these criteria manifest themselves on the skin (A single plexiform neurofibroma or two of any type, minimal number of 6 lesions of CALMs, and axillary freckling-**Crowe,s sign**).

Tuberous sclerosis

- It is now frequently designated the tuberous sclerosis complex (TSC). It is an autosomal dominant human genetic disease characterized by widespread hamartomas, usually, occurring in the brain, eyes, skin, kidneys, liver, heart, and lungs.
- This disorder derives its name from a description of its cerebral lesions by Bourneville in 1880. Its systemic nature was described by Vogt in the clinical tried (Epi-loi-a) of epilepsy (seizures), low intelligence (mental retardation) and facial lesions termed adenoma sebaceum (a misnomer for angiofibromas). Recent studies have shown that full triad was evident in only about one third of patients.
- Cutaneous features are the most frequent finding in TSC and if overlooked, will lead to a delay in diagnosis. Although, there is considerable variation in the age of expression of all the skin lesions, there is a trend towards the earlier expression of hypomelanotic macules and forehead plaques compared with facial angiofibromas and ungual fibromas. Shagreen patches are usually present by puberty.
- The relatively vascular and fibrous components of adenoma sebaceum (angiofibromas) determines their clinical appearance .They range form white or flesh coloured to classical red pink papules, 1-10 mm in diameter, symmetrically distributed over the nasolabial folds, cheeks and chin, sparing the upper lips. They are regarded by many as a primary pathognomonic feature of TSC.
- **Shagreen patches** are not as diagnostically useful as facial angiofibromas. They most often appear as flat, slightly elevated areas of the skin, soft and skin colored plaques of variable size (1 cm to 10 cm) with a “pig skin”, “elephant skin” or “orange peel appearance”. Usually, these lesions are localized asymmetrically over the dorsal body surfaces, particularly over the lumbosacral area
- **Periungual fibromas (Koenen’s tumors)** common in adult patients with TSC are much less frequent in children. They usually appear around puberty as smooth, firm, flesh colored excrescences and are usually 5-10 mm in length. They are located around or under the nail plate and arose from the bed under the nail plate or from skin of nail groove.). Regarded as angiofibromas, they are classified as primary or pathognomonic feature of TSC.
- **Ash leaf macules/spots (hypomelanotic macules)** are the most frequent lesions in TSC patients. Since, they resemble the leaf of European mountain ash tree; they are called as ash leaf spots. They are ovoid or leaf shaped white macules varying in size from 1-3 cm and may be the only skin lesions in infants and if associated with infantile spasms, strongly suggest the diagnosis of TSC. These ash leaf spots are predominantly distributed on the trunk and buttocks or limbs.
- **Forehead fibrous plaque** is classified histologically as an angiofibroma, although clinically it differs form the typical papulonodular angiofibroma because of fibromatous appearance. It is one of the secondary features of tuberous sclerosis.
- **Molluscum fibrosum pendulum (skin tags)** is commonly seen in normal elderly people and is uncommon in adolescents and young adults, and should alert to the possibility of TSC. In individuals with TSC, molluscum fibrosum pendulum is commonly seen on the neck, groin, and axillae and near flexures of limbs, especially in adults.
- **Café-au-lait macules** are not regarded as characteristic for TSC and are not included in the diagnostic criteria..

- **Diagnosis-**Because no genetic test is yet available, TSC must be diagnosed clinically. The 1992 consensus report of the diagnostic criteria committee of the National Tuberous Sclerosis Association (NTSA) consists of a long list of features. It rely upon primary, secondary and tertiary features, with a definite diagnosis requiring on eprimary feature, two secondary ones or one secondary plus two tertiary features. **Two of six primary features are cutaneous ones: facial papulonodular angiofibromas and periungual fibromas. Among the secondary features, two are also cutaneous: forehead plaques and shagreen patches. Finally, two tertiary criteria features: hypomelanotic macules and "confetti-like lesions" are cutaneous.**

Von Hippel-Lindau disease (VHL)

- VHL also referred to as CNS angiomatosis is inherited in an autosomal dominant fashion with incomplete penetrance. Both sexes are equally affected. Hippel first decribed retinal angiomatiosis in 1904. Lindau subsequently recognized association with central nervous system tumors and hence the eponym von Hippel Lindau disease was coined.
- Cutaneous findings are portwine stains and café-au-lait macules. Dermal capillary malformation has predilection for the head and neck. Other manifestations are vascular malformations in the cerebellum and brain stem. Retina is also commonly affected. There may be cystic neoplasms or angiomatous lesions in the kidneys, liver and pancreas.

Xeroderma Pigmentosum (Pigmented Dry Skin)

It is an autosomal recessive disorder characterized by photosensitivity, pigmentary changes, premature skin aging, neoplasia and abnormal DNA repair.

- Eight different subtypes- complementation groups A to G and XP variants.
- Main defect is in the DNA excision repair process (this is a process whereby damaged DNA is replaced with new DNA)
- XP-variants have a normal nucleotide excision repair but the defect here is of a reduced molecular weight of newly synthesized DNA in radiated cells.

Clinical Features

- Skin normal at birth
- Earliest symptoms of dryness and freckling appear between six months and three years of age.
- Freckles appear over face and hands, and later on neck, legs, lips and conjunctiva. Eventually freckles become permanent and progressively increase in number.
- Continued sun exposure causes skin to become dry and parchment like with pigmentation (hence the name xeroderma pigmentosum)
- Next is the poikilodermatous stage characterized with atrophy and telangiectasia superadded to the existing freckles and hyperpigmentation .
- Superficial ulcers and atrophy may leave scars and contractures.
- Ocular features include – photophobia with conjunctival injection, symblepharon, ectropion/ entropion and loss of eye lashes due to atrophy of eyelid skin, keratitis leading to corneal opacity, pterygium and ocular neoplasms.
- Pre-malignant lesions like actinic keratosis and keratoacanthomas may occur in most cases.

- Patients with XP under 20 years of age have a greater than 1000 fold increased risk of cutaneous basal cell or squamous cell carcinoma or melanoma. The median age of onset of nonmelanoma skin cancer reported in patients with XP was 8 years.
- Overall, there is a ten to twenty-fold increase in internal neoplasms (central nervous system, ling, gastric, breast, renal etc.) in XP.
- 20% have neurological complaints-mental retardation, areflexia, spasticity, ataxia, and sensorineural deafness.
- Disease is often fatal under 10 years of age and two thirds of the cases die by 20 years of age.
- Prenatal diagnosis by amniocentesis is possible.
- The mainstay of management is by ensuring maximum photoprotection (clothing, topical and systemic sunscreens, dark glasses). Ocular symptoms should be managed promptly to prevent complications. Early and adequate excision of all tumors is essential and 5-fluorouracil may be used for pre-malignant lesion.

Incontinentia Pigmenti

- Incontinentia pigmenti is an uncommon genodermatosis of the developing neuroectoderm in which vesicular, verrucous and pigmented lesions are associated with developmental defects of eye, skeletal system and central nervous system.
- Incontinentia pigmenti is a complex hereditary syndrome that principally affects female infants. It is inherited as an X-linked dominant disorder.
- This multisystem disorder has manifestations of dermatological, 33% neurological, 40%skeletal, 31%ocular or 90% dental origin.
- It manifests at birth or during first weeks of life.
- In the skin, the disorder characteristically progresses through four stages. The first stage is characterized by linear whorled vesicular eruption along Blaschko's lines. The eruption typically favors acral locations. Peripheral leucocytosis and eosinophilia may occur during this stage. This stage is followed 2 to 6 weeks later by verrucous or lichenoid lesions on the sites of the former vesicular eruption in 30% of patients. The third stage starts between 12^{th} and 20^{th} week and is characterized by hyperpigmented lesions. These lesions subsequently fade in several years, leaving behind hypopigmented macules along the Blaschko's lines. The hair is usually normal, but in 25% of cases, cicatricial alopeica may be seen.Usually, no treatment is necessary other than the control of secondary infection.

Chapter 14

Dermatological Manifestions in Pregnancy & Paediatrics

Dermatoses of Pregnancy

- Pregnancy is characterized by the advent of a new endocrine organ (the placenta) Placenta produces steroid hormones like estrogens, progesterone and proteins hormones including HCG, HPL and HCT. Hence, there is a profound physiological endocrine upheaval leading to cutaneous changes which can be divided into physiological and pathological.

Physiological Changes

1. **Pigmentary Changes**

   - There is a generalized increase in skin pigmentation more so over the nipples, areolae, genital areas and the midline of the abdominal wall. Chloasmal pigmentation is seen in about 70% of women which may fade completely after parturition or persist. Also, an increase in the size, activity and also, number of melanocyte naevi has been observed.

2. **Hair and Nail Changes**

   - Postpartum alopecia and mild frontoparietal recession may occur.
   - Brittleness of nail plate and distal onycholysis has been reported.

3. **Eccrine, apocrine and sebaceous gland activity**

   - There is increased frequency of miliria although palmar sweating decreases. Fox-Fordyce disease usually improves in pregnancy, suggesting a reduced apocrine activity. Sebum excretion tends to increase during pregnancy and return to normal after delivery.

4. **Vascular Changes**

   - Sustained high levels of circulating estrogens result in vascular spiders palmar erythema and haemangiomas all of which usually disappear post partum. Varicose veins and haemorrhoids are frequent complications of pregnancy. Gingival edema and pregnancy epulis are seen in around 80% of pregnant women as a result of the general increase in vascularity associated with high estrogen levels.

5. **Connective Tissue**
   - Striae distensae and multiple skin tags are common features of most pregnancies.
   - Pathological changes

- Specific dermatoses of pregnancy include pemphigoid (herpes) gestationis, polymorphic erutpion of pregnancy, Prurigo of pregnancy (Besnier) and pruritic folliculitis of pregnancy.
- The less well- defined dermatosis include papular dermatitis of pregnancy, auto-immune progesterone dermatitis of pregnancy and prurigo annularis.

Pemphigoid gestations

- Described in blistering disorders

Polymorphic Eruption of Pregnancy

- Incidence of 1 in 240 pregnancies is reported. The eruption begins in third trimester, usually of first pregnancy. Aetiology is obscure. Clinically intensely itchy, urticated papules and plaques over the lines of striae which later spread to upper arms and thighs are seen. Treatment modalities include topical calamine or steroids and systemic sedative antihistamines.

Prurigo of Pregnancy

- Incidence is 1 in 30 pregnancies. Usually begins between 25 and 30 weeks of gestation Clinical features include multiple excoriated papules seen over the abdomen and on the extensor surfaces of the limbs.
- The lesions tend to persist throughout pregnancy and puerperium, but the pruritic element usually settles after birth. Treatment is symptomatic

Pruritic folliculitis of Pregnancy

- Itchy, red, follicular papules strongly resembling steroid- induced acne are seen beginning in the second or third trimester usually resolves within 2 weeks of delivery.

- Increased incidence of infections like candidiasis, trichomoniasis, condylomata acuminata, pityrosporum folliculitis, herpes simplex and autoimmune disorders like lupus erythematosus and pemphigus are seen during pregnancy. Tumors like mycosis fungoides and neurofibromatosis also show increased frequency.

Paediatric Dermatology

Transient cutaneous lesions in newborn

- **Vernix caseosa** – golden yellow staining of vernix caseosa occur in haemolytic disease of the newborn and post maturity
- **Acrocyanosis** – cyanosis seen in acral areas in a neonate
- **Erythema neonatorum** – within a few hours of birth – erythema fades spontaneously within 24 – 48 hours
- **Harlequin colour change** – upper half of the body becoming pale and the lower half a deep red colour, with a sharp midline demarcation between the two, stay for half a minute to 20 minutes, in a full term or pattern newborn seen during first week of life

- **Cutis marmorata** – this marbling change due to reticular blue vascular pattern seen in infancy
- **Physiological scaling of the newborn** seen in up to 75% of the normal neonates
- **Sebaceous gland hyperplasia** characterized by multiple, uniform, pin point yellowish papules, most prominent on the nose, cheeks, upper lip and forehead, but may be visible on the upper trunk, especially the areolae, genitalia and the limbs. This phenomenon is associated with milia which represents minute follicular epidermal cysts
- **Linea alba becomes pigmented in** about 8% of babies
- **Exaggerated pigmentation of the scrotum** occurs in about 30% of oriental neonates, generally associated with Mongolian spots
- **Milia** represent miniature epidermal inclusion cysts that originate from sebaceous apparatus of vellus hair. Epstein pearls are clinically and histologically the intra oral counterpart of facial milia
- **Succulent gums (Sucking pads)** – a whitish hue to the oral mucosa
- **Erythema toxicum neonatourm (Toxic erythema of the new born, etythema neonatorum)** presents as asymptomatic macular erythema on the trunk within first 48 hours of birth. Subsequently, it may evolve into urticarial papules of pustules. Recovery occur in 3 days. Smears of the pustule contents demonstrate inflammatory cells, more than 90% of which are eosinophilis. There is an associated blood eosinophilia in 50% cases
- **Mongolian spots** – described in vascular lesions
- **Acne neoantorum (Neonatal acne)** – develops with the first 30 days of life
- **Perianal dermatitis** is an erythema centered on the anus, occasionally accompanied by erosion and bleeding at 4^{th} to 7^{th} day of life
- **Transient neonatal pustulosis (Transient neonatal pustular melanosis)** invasiably presents at birth. It is characterized by the presence of fragile superficial pustules mainly over the chin, neck, forehead, back and buttock. Hyperpigmented macules develop subsequently. They may persist for 3 months and affected infants are otherwise normal. Pustules are formed due to subcorneal collection of neutrophilis with a few eosinophils, Bacterial culture is negative. Pigmented macules demonstrate basal and supra basal increase in pigmentation only, apparently without pigmentary incontinence

Skin disorders in children (Paediatric dermatoses)

- Table; Classification of common pediatric dermatoses

1. **Infestation and infections**
    a. Parasitic infestations – Pediculosis capitis, scabies
    b. Bacterial infections – Pyodermas
    c. Viral infections – Molluscum contagiosum, warts, herpes simplex, chicken pox, herpes zoster
    d. Fungal infections – Tinea capitis, tinea corporis, piryriasis versicolor, candidiasis
2. Dermatitis and eczema – Infantile seborrheic dermatitis, diaper or napkin dermatitis, atopic dermatitis, infective dermatitis
3. Urticaria
4. Exanthems – Viral exanthems (Measles, rubella, roseola infantum, erythema infectiosum)

5. Drug eruptions
6. Pigmentary disorders – Postinflammatory pigmentation, hypopigmentary disorders (Pityriasis alba, vitiligo, nervus achromicus, ash leaf macule, albinism), hyperpigmentary disorders (Mongolian spots, café au lait macules)
7. Disease of hair and nails – Tinea capitis, alopecia areata, diffuse alopecia, twenty nail dystrophy
8. Genetic disease of the skin – Ichthyoses, acrodermatitis enteropathica
9. Collagen vascular diseases – connective tissue diseases (Lupus erythematosus, scleroderma, and dermatomyositis) and vasculitic syndrome (Henoch – Schonelein purpura, acute hemorrhagic edema of infancy, and polyteritis nodosa)
10. Miscellaneous conditions – Papular urticaria, miliaria, miliaria cystalina, psoriasis, hemangiomas, chilblains

Some important viral exanthems in children

Chicken POX

I. Causative virus Herpes zoster/Varicella zoster virus of B. subgroup of Herpes viruses.

II. **Transmission:** Droplets through naso-oral route.
- Patient is infectious 2 days before to 5 days after the appearance of rash.

III. **C/F❖** Lesions are preceded by pain or constitutional symptoms, centripetal distribution (Face, trunk) sparing extremities. Oral and conjunctival mucosa may also be involved.
- Lesions arise in crops, quick progression of Erythematous macule to papules to vesicles to pustules to crusts.
- Dried scab are non infectious.

IV. Complications

- More common in immunocompromised adults. These are encephalitis, pneumonitis ,hepatitis,arthritis, Reye's syndrome, secondary infection, symptomatic thrombocytopenic purpura, Steven's Johnson syndrome, keratitis. Infection during 1st 4 months of pregnancy can cause congenital malformations in the baby like micrognathia, eye defects, and encephalomyelitis.

V. **Diagnosis**- Tzanck smear from the base of a vesicle stained with giemsa shows Giant cells and cells with inclusion bodies.
Direct immunofluoresence and PCR and complement fixation techniques can also be used.

VI. Rest and treatment of secondary infection.
- Antiviral therapy includes higher doses of Acyclovir (10 mg/kg 8 hrly. i/V) usually 800 mg 5 times/day for 7-10 days. Others used are valaciclovir and Famciclovir.
- The Rx should be started as soon as possible, preferably within 1st 48 hrs to reduce the duration as well as complications of the disease.
- The disease confers life long immunity.

Measles (rubeola, morbilli)

- The term measles is thought to come from Latin "misellus" or "misella", a diminitive of Latin "miser" meaning miserable
- It is caused by measles virus (a paramyxovirus, RNA virus)
- Incubation period is 10 – 11 days
- Measles is a universal highly contagious disease of children. It has a characteristic prodrome of 3-4 days that consists of high fever, cough, coryza, a striking palpebral conjunctivitis with photophobia and Koplik's spots, which precede the apperance of florid generalized macular and popular rash
- The first lesion to appear on the soft palate as blochy erythema, but the most appear as tiny white lesions surrounded by an erythematous ring (grain of sands)
- Koplik's spots precedes the onset of generalized rash by 1-2 days, remain for two to three days and are usually heavily clustered on the mucosa opposite the second molar
- The purplish red rash on the body appears first behind the ears and over the forehead, and then spreads slowly to involve the entire body by third day. The eruption extends downwards over the neck, shoulders and trunk and then distally over the upper and lower extremities
- Uncomplicated measles runs a self limited course lasting about 10 days
- There is no specific therapy for measles

Rubella (German measles)

- Rubella virus is a togavirus, commonly recovered from pharynx
- Incubation periods is **14 – 21 days**
- Rubella is a common communicable infection of children and young adults characterized by **a short prodromal period; enlargement of cervical, subocciptial and postauricular glands and a rash of approximately 2 to 3 days duration**
- An enanthem **Forschheimer's sign** is present in up to 20% of patients during the prodromal period or on the first day of the rash. Dull – red macules or petechiae are confined to the soft palate
- The disease has rare sequelae apart from devastating effect on the fetus

Exanthem Subitum (Sixth disease, Roseola infantum)

- Caused by Human herpes virus type 6 (DNA virus)
- Incubation period is 10 – 15 days
- Most common exanthema with fever in children under age group of 2 years
- Prodromal fever is usually high. Fever drops on fourth day
- Convulsions and lymphadenoapthy may accompany it
- Clinically, a morbilliform erythema consisting of rose coloured discrete macules appears on the neck, trunk and buttocks
- Often there is a blanched halo around the lesions
- The lesions resolve in 1 to 2 days
- Other common associated findings include otitis media, diarrhoea and meningoencephalitis

- In adults HHV – 6 infection resembles otitis mononucleosis
- Treatment – acyclovir, ganciclovir

Erythema Infectiosum (Fifth Disease)

- Exanthematous disease occurring in patients with primary human parvo virus B 19 infection (DNA virus)
- Incubation periods is **4 – 14 days**
- More commonly seen in school children
- Infection is spread by respiratory droplets during the prodrome
- Constitutional symptoms are absent or very minimal

Three stages of rash are

- "Slapped cheek" appearance (1 to 4 days)
- Erythematous papular eruption over the upper and lower extremites spreading to trunk. Assumes a lace – like or reticulated appearance as it fades
- Recurrent evanescent stage (for weeks or months) is performed seen in older children and adolescent
- Adults may present with atypical rash and arthritis
- Complication – Hydrops foetails (maternal infection) and Aplastic crisis
- Treatment – supportive

Gianotti – Crosti syndrome

- Infantile papular acrodermatitis, or the Gianotti-Crosti syndrome, presents with symmetric erythematous lichenoid papules on the face, extremities, and buttocks, usually sparing the trunk
- The eruption is not pruritic and may be accompanied by Splenomegaly, hepatitis, and lymphadenopathy
- The process often occurs in young children after an upper respiratory tract illness
- Pathologic specimens show a perivascular infiltration of lymphocytes and histiocytes in the upper portion of the dermis
- While the syndrome has been associated with hepatitis B and enterovirus infection, several cases have been associated with acute EBV infection
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Chapter 15

IMPORTANT ENTITIES

HENOCH SCHONLEIN PURPURA

- Henoch Schonlein purpura is a IgA mediated vasculitis syndrome affecting skin, joints, GIT and kidneys
- It usually occurs below the age of 20 years
- The eruption may begin as crops of palpable purpuric lesions or uriticarial rash in the lower legs and buttock
- Abdominal symptoms such as colic, vomiting and diarrhea are seen in two-third of the patients
- Polyarthralgia is seen in most patient and renal involvement can rarely lead to chronic nephritis
- Diagnosis: Histopathology shows leucocytoclastic vasculitis and immunofloresence demonstrates IgA deposition around blood vessels
- Treatment: No specific treatment available. Antibiotics and corticosteroids can be given to alleviate symptoms

Urticaria Pigmentosa :- Urticaria pigmentosa is the most common type of cutaneous mastocytosis that occurs due to the accumulation of mast cells in the skin

- The skin lesions are itchy small, yellow tan to reddish brown macules scattered all over the body
- Mild trauma such as scratching or rubbing the lesions may cause urtication and erythema around macules this is knownas Darier's sign
- Urticaria pigmentosa is associated with Pruritus which may be exacerbated by temperature, friction, spicy food, alcohol and drugs
- Diagnosis: Histopathlogy shows mast cell infiltration in the dermis
- Treatment: Avoidance of precipitating factors and antihistaminics

Langerhans Cell Histiocytosis (LSH)

- Langerhans cell histiocytosis a disease that results due to the proliferation or cells like Langerhans cells called as LCH cell (share the ultrastructural features with Langerhans cells – containing Birbeck granules) in any organ. This "LCH cell" is about four to five times larger than small lymphocytes; has an irregular and vesiculated nucleus; is often reniform (kidney sharped); and has abundant, slightly consinophilic cytoplasm
- It is broadly classified into entities such as Letterer – Siwe disease, Hand – Schuller Christian disease and eosinophilic granuloma
- Eosinophilic granumola occurs due to localized proliferation of "LCH cells" in the bones, skin, lymph nodes, lung, liver and spleen
- Hand – Schuller – Christian syndrome syndrome is a chronic multisystemic disease known by the triad of exophthalmos, multiple skull lesions and diabetes insipidus
- Letterer – Siwe disease is usually seen in children less than 1 year. It is characterized by seborrheic dermatitis like rash with hemorrhagic popular, vesicular, pustular and ulcerated lesions in the intertriginous regions and trunk
- Letterer – Siwe disease is often associated with Hepatosplenomegaly, dysfunction of liver, lungs hematopoietic system. Lytic lesions may be seen in skull bones
- Diagnosis: Histopathology shows LCH cell infiltration of the lesions **TREATMENT**: LOCALIZED FORMS CAN BE TREATED WITH INTRALESIONAL STEROIDS OR SURGERY. MULTISYSTEMIC INVOLVEMENT NEEDS CHEMOTHERAPY

Mucocutaneous Manifestation of AIDS :

Skin is the most commonly affected organ in patients with HIV

Infectious Disorders:

1. Viral :
    - Herpes simplex
    - Herpes zoster
    - Oral hairy leukoplakia – EBW
    - Warts
    - Molluscium contaciosum
2. Bacterial :
    - Folliculitis
    - Impetigo
3. Fungal :
    - Candidiasis – Most common
    - Superficial dermatomycosis
    - Pityrosporum infections
    - Cryptococcosis
4. Arthropodes :
    - Scabies – Norwegian scabies

Non Infectious:

1. Seborrhoeic dermatitis – Most common skin condition in HIV
2. Psoriasis – Retinoids are drug of choice
3. Reiter's syndrome
4. Xerotic dermatitis
5. Cutaneous drug eruptions – increases 3 to 30 – 70%

Opportunistic Neoplasms :

1. ***Primary Cutaneous Neoplasms*** :

❖ Incidence of epithelial neoplasms in oral, cervical & anorectal are increased
❖ Bowenoid papulosis or in situ SCC
❖ Basal cell carcinoma

2 Lymphoreticular Malignancy :

❖ Visceral lymphoma is most common
❖ Skin shows non hodgkin's lymphoma
❖ CTCL

***3* Kaposi Sarcoma** :

❖ Vascular neoplastic disorder , caused by Human Herpes Virus – 8
❖ Pink, red brown or purple macules, patch at early stage
❖ Nodules and tumour in later stages
❖ Site of involvement – legs, feet, trunk, scalp, hard palate

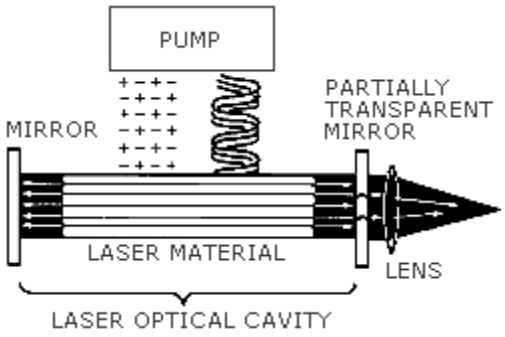
- ❖ K S lesions resolves with Anti retroviral therapy (HAART)
- ❖ Liquid Nitrogen Crytherapy for single lesion

LASERS IN DERMATOLOGY

- **Definition of laser**
- **Mechanism of action in dermatology**
- **Classification of laser**
- **Usage of lasers in dermatology**

LASER: - Light Amplification by Stimulated Emission of Radiation (LASER) produces an intense beam of light of particular wavelength with insignificant dispersion over a short distance. This property is utilized in dermatology to treat various skin disorders.

Laser Components

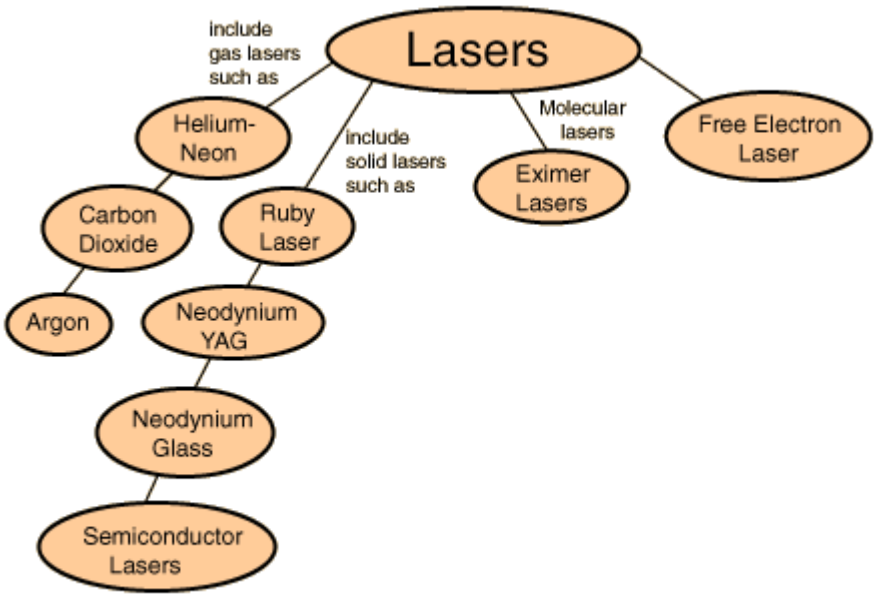


Mechanism of action in dermatology

- When a laser beam is directed at the skin, it is absorbed by the water, naturally occurring pigments like melanin and hemoglobin. It is also absorbed by artificial pigments introduced by means of tattooing.
  Lasers causes very precise tissue destruction of the lesion in focus and leaves the skin tissue in the immediate surrounding undamaged. It is this precision that has generated tremendous interest among dermatosurgeons to use it as an operative tool.

Classification of lasers:

- There are various kind of lasers available today depending on the source producing the laser. Each of them has specific range of utility, depending on its wavelength and penetration.



Some of the commonly used lasers in dermatology

Carbon Dioxide Laser:- Carbon dioxide laser produces an infra red laser which is absorbed by water. It can be used as a focused or defocused laser. The focused laser is used for skin resurfacing in super pulsed mode which is also called 'laserbrasion' (rapid pulsing of powerful laser beam). It is used for fine lines, wrinkles, sun damage.
In defocused mode there is a large spot of laser that is less intense and pulsed. It removes thin very superficial layers of skin without penetrating deeper.

Carbon dioxide laser is a powerful tool but it has high incidence of scarring and pigmentary disturbances in inexperienced hands.

Nd YAG / Erbium Yag Laser

- 'Neo dynamium - Yttrium Aluminum Garnet laser' (Nd YAG laser, CoolTouch™) is a versatile laser. It has a wave length of 1064 nm and has the capability to reach deeper layers of skin tissue. In Q - switched mode Nd YAG produces two wavelengths, one in the infrared range; this is used for blue tattoos, deep (professional) tattoos and dermal pigmented lesions. Second is the green laser which is useful for superficial brown lesions

and red / orange tattoos. Pigment removal is done by rapid short pulsed laser beams. Long pulsed beams are used for epilation.

- Erbium YAG is a popular modification (Rubinlaser™, Unilas Erbium YAG ML10™). It has a wave length of 2940 nm. It produces laser in the infrared range. in pulsed mode it is used for treatment of wrinkles, acne scars (resurfacing), precancerous lesions and for 'laser peels'.

PULSED DYE LASER

- As the name suggests this laser uses a liquid dye (Rhodamine 64). It produces yellow laser which is delivered in short flashes (Cynosure™ PhotoGenica V- Pulsed Dye Laser). This is absorbed by the hemoglobin present in the blood and tissues and produces heat damage. This is therefore use to treat vascular lesions like Portwine stains and other hemangiomas. It is also used to treat pigmented nevi.
  Long pulsed dye laser is used to treat fine veins and blushing.
  Vasculight™ (by ESC) is a popular pulsed dye laser.

DIODE LASER

- Diode lasers are semiconductor lasers. It produces laser beam in the wave length of 800 nm (LightSheer™).It is most popularly used for hair removal. Innovative devices with cooling mechanisms give better results with less scarring. Diode lasers have been found to work well on dark skin (Gallium Aluminum Arsenide Semiconductor Diode laser, 810 nm). In dark skin long pulsed diode laser is preferred. diode laser in long pulsed mode is also used for treatment of leg veins.

ALEXANDRITE LASER

- Alexandrite laser produces beam in the wavelength of 755 nm. It is also available in the Q - switched mode. It is absorbed by the melanin and the artificial tattoos in the skin.
  Rapid pulsed alexandrite is used to remove tattoos, benign pigmented lesions.
  Long pulsed Alexandrite laser is used for hair removal (GentLASE™).

ARGON LASER

- Argon laser has the wavelength of 488 nm and 514 nm. It produces blue and green colored lasers which are absorbed by pigments like Hemoglobin and Melanin. Argon laser is used to treat skin diseases like A-V malformations, Hemangiomas, fine veins, spider nevi and acne rosacea.

RUBY LASER

- Ruby laser produces red beam in the wavelength of 694 nm. It is also available in Q - switched mode (Spectrum™ Q - switched Ruby Laser). In high energy rapid pulsed mode it is used to remove tattoos, brown pigmented disorders like actinic lentigenes, freckles, nevi and 'cafe-au-lait' spots.

Usage of lasers in dermatology

1. **Tattoos** are difficult to treat. Q - Switched Ruby laser, Nd YAG laser are effective, red and orange tattoos are more easily removed. Multiple sessions over many months may be required to attain favorable results. Color of the tattoo and the depth of the pigment influence the duration and the out come of the laser treatment.
2. **Portwine stains** can be removed with Pulsed dye laser (Vasculite™) and Carbon dioxide laser. It requires multiple sittings but results are satisfying.
3. **Spider nevi** can be treated with Pulsed dye laser and Long pulsed Nd YAG laser. Lesions on the face can be treated with KTP laser.
4. **Warts** a viral infection caused by Human Papiloma virus are effectively removed by Carbon dioxide or Pulsed dye lasers.
5. **Scars** like acne scars, ice pick scars are resurfaced with Erbium YAG laser or Carbon dioxide laser. Hypertrophic scars are flattened with Pulsed dye laser.
6. **Moles and Nevi** are removed for medical or cosmetic reasons using Carbon dioxide, Ruby or Erbium YAG laser depending on the type. Pulsed Dye Lasers are also used to treat 'Giant pigmented nevi'.
7. **Lentigenes (age spots)** are removed using Ruby laser.
8. **Hair removal** temporary or long term has become an easier task with advent of lasers. Largely, laser hair removal gives excellent results in fair skinned people. Listed below are a few lasers used for hair removal.
    - Epilight™
    - Medilite™ (Q switched YAG)
    - GentLASE™ (long pulsed Alexandrite laser) preferred for dark hair in light skinned.
    - Lyra™ (long pulsed YAG) for dark skinned people.

The lasers are absorbed by hair follicle and spares other skin appendages. Cooling devices further prevent the heat damage to rest of the skin. Laser hair removal needs multiple sessions. Re-growth of hair after each session may take from 3 months to up to a year where latter is considered as a 'very good result'. The re-growth is thinner, slower and scantier after each session.

9. Resurfacing is done effectively using lasers for acne scars, pits and small pox scars. Wrinkles are also treated by this technique. This procedure involves precise removal of very thin layer of irregular skin. Carbon dioxide laser and Erbium YAG laser are used for laser-ablation. Q - switched Nd YAG laser is used for non-ablative resurfacing.