Leprosy

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Leprosy - Overview

- Slow progressive infection
- Caused by M.leprae
- Site of infection: skin & peripheral nerves.
- Prolonged progressive infection results in destruction of t tissues causing disabling deformities.
- Infection is low communicability but affetcs 10-15 million people worldwide in the poor tropical regions of the world.

Transmission

- Person-to-person contact transmission
- Infection transmitted via aerosols from infection in upper respiratory tract.
- Once inhaled, mycobacterium is taken up by alveolar macrophages & disseminates through the blood.
- But organism grows well in the cool tissues of the body – skin & extremities.

Pathogenesis

- M.leprae is acid-fast obligate intracellular organism.
- Grows more slowly than other mycobacterium spp.
- Grows best 32-34 degree Celsius.
- Virulent factors: No toxins, main virulent factor is its cell wall properties.
- Cell wall induce cell mediated immunity and secretion various cytokines causing chronic inflammation.

Clinical Picture

- Determined by host cell mediated immune response.
- 5 clinical subtypes seen:
  - Lepromatous leprosy,
  - Tuberculoid leprosy,
  - Borderline lepromatous,
  - Borderline tuberculoid &
  - Borderline.

Tuberculoid Leprosy

- Good cell mediated immune system.
- Able to mount T cell mediated immune response against organism.
- Mild form and sometimes self limiting infection.
- Macrophages ingest mycobacterium and form granulomas (similar to those seen in tuberculosis).
- Granulomas will contain: epitheloid macrophages, giant cells and few surviving mycobacteria (Paucibacillary diseases). **CD4+ & CD8+ cells** present in granulomas.
- Delayed hypersensitivity reaction is intact hence lepromin skin test is **POSITIVE.**
- Prolonged infection $\longrightarrow$ destruction of nerves & nerve sheaths. Granuloma forms. Localised superficial, unilateral skin & nerve lesions (1-2 skin lesions).

Tuberculoid Leprosy – Skin lesion

- Facial nerve involvement can lead to facial nerve palsy.
- Skin lesions characteristics:
  - Well defined
  - Hypopigmented
  - Elevated blotches
  - Area within rash is hairless with diminished or absent sensation (central healina).
- Nerves: greater auricular nerve, ulnar, posterior tibial and the peroneal nerve.
- Bacilli hardly seen in biopsies, only granulomatous inflammation features (resemble hard tuberculous).
- Patients are non-infectious.

Lepromatous Leprosy

- Severe form of diseases.
- Patients cannot mount a cell mediated immune response against organism.
- Defective T-suppressor (T-8 cells) block T-h cell's response to M.leprae antigens.
- Sites: skin, peripheral nerves, anterior eye, upper respiratory tract (down to larynx), testes, hands and feet.
- Vital organs rarely affected.
- Macular papular or nodular lesions form on face, ears, wrists, elbows and knees.
- With disease progression, lesions coalesce to form distinctive leonine facies (lionlike).
- Most skin lesions are hypoesthetic or anesthetic.

Lepromatous Leprosy

- Nasal cartilage destruction – saddlenose deformity. Persistent infection will have bacilli-laden discharge.
- Seminiferous tubules destruction – infertitility.
- Peripheral nerves – ulnar and peroneal nerves commonly affected where they approach the skin.
  - Symmetrically involvement with minimal inflammation.
  - Loss of sensation and trophic changes follow nerve lesions.
- Most peripheral nerves are thickened & loss of sensation is in a glove & stocking distribution. Widespread invasion into Schwann cells affecting endoneural and perineural macrophages.
- Anesthesia leads to repetitive trauma and secondary infection of fingers and toes/feet & resorption of fingers and toes.
- Patients infectious.

Lepromatous Leprosy

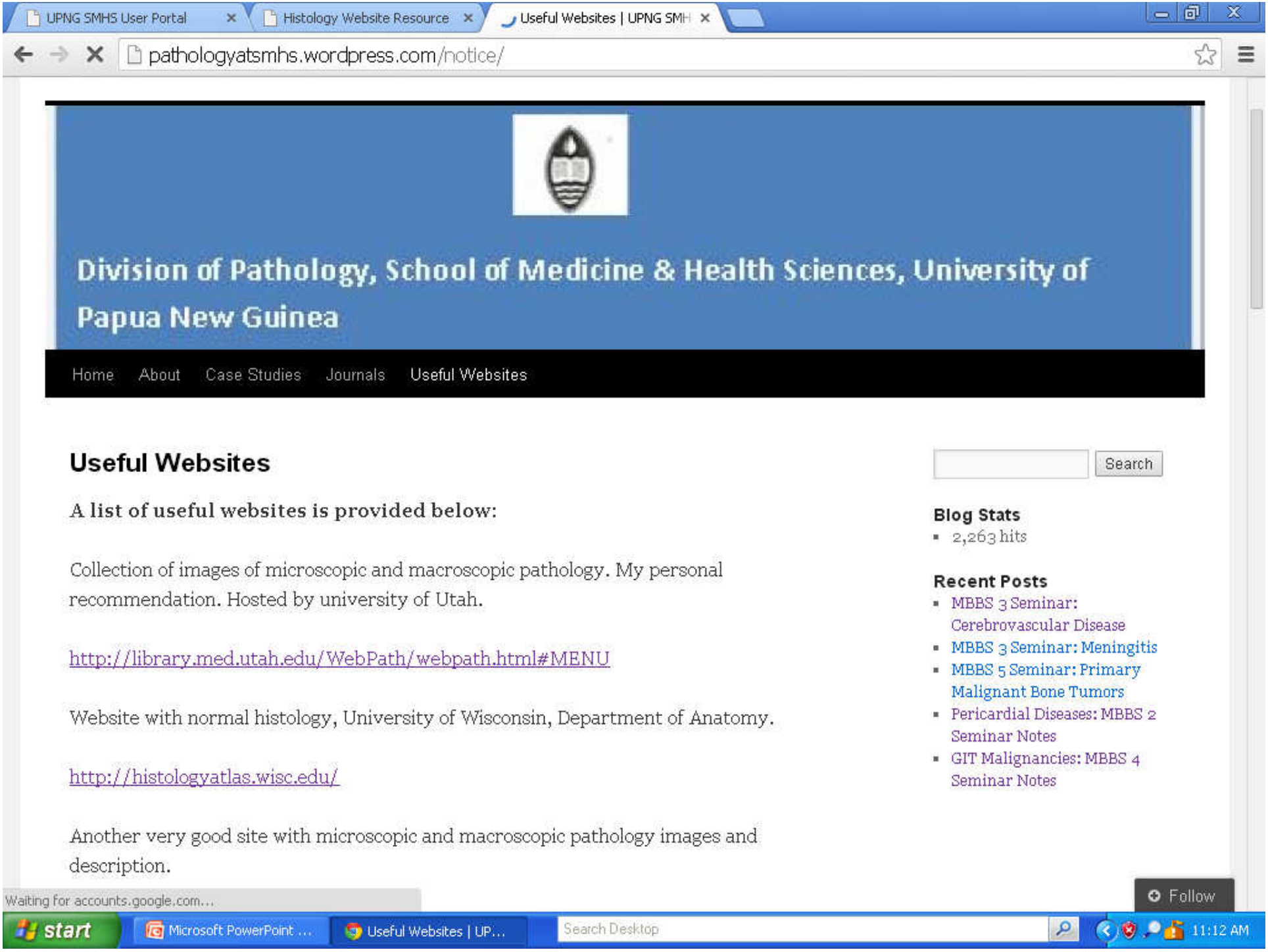
- Biopsy findings:
  - Lymph node – foamy histiocytes in paracortical areas (T-cell areas).
  - Lesions will have foamy macrophages and large numbers of mycobacterium (multibacillary lesions).
  - Advance diseases: macrophage aggregates also present in spleenic red pulp and liver.
- Lepromin test: NEGATIVE
- Ab against Ag produced but not protective. Ab-Ag complex reaction results in erythema nodosum, a severe form of vasculitis & glomerulonephritis.

BB, BL & BT Leprosy

- 3 remaining caterogories represent a continuum between LL & TL.
- Skin lesions in BL will be more numerous and greater diversity of shape than BT.
- Lepromin test: similar to PPD.
  - Used mainly for prognostic indicator, rather than diagnostic.
  - Used to place patients on the immunological spectrum.

Summary – Spectrum of Leprosy

	Tuberculoid	Borderline	Lepromatous
No. Skin lesions	Single	several	Many
Hair growth on skin	Absent	Slightly decreased	Not affected
Sensation in lesions of extremities	Completely lost	Moderately lost	Not affected – but in glove & stocking distribution
Acid fast bacilli in skin biopsies	none	several	Innumerable
Lepromin test	Strongly positive	No reaction	No reaction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