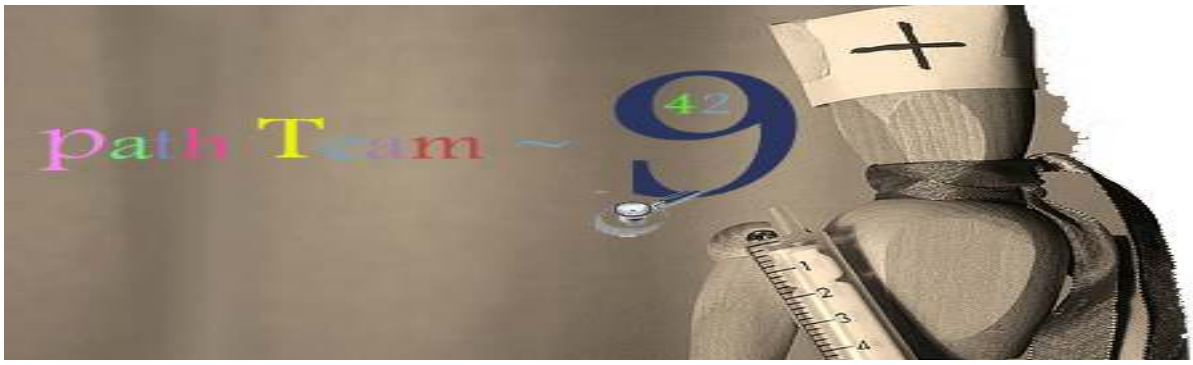

GRANULOMATOUS DISEASES

هذا الملخص عبارة عن نوتات الفريق أثناء المحاضرة.

الملخص "**لا يغني**" عن السلايدات. وإنما يجب الرجوع لسلايدات "الطلاب" في الأساس.
ثم قراءة هذا الملخص كمساعدة لـ **:**

- معرفة بعض المعلومات الإضافية التي ذكرت أثناء المحاضرة.
- توضيح بعض النقاط الغامضة.
- التركيز على أهم المعلومات.

429 تيم باث

رفيف مطر - أسماء بديوي
سارة بن حسين - مشاعل الطويرقي
رهام الحناكي - رائد فرج
محمد الحربي - عبدالرحمن القحطاني

GRANULOMATOUS DISEASES

GRAULOMA

- Ultimate step is accumulation of activated macrophages (epithelioid macrophages).
  - The suffix [oid] means “looks like”, so here epithelioid macrophages look like epithelial cells

- Importance of Granuloma : unique type of chronic inflammation.

- REMEMBER:
  - acute inflammation → neutrophils
  - chronic inflammation →peripheral lymphocytes then macrophages

- What is seen in a Granuloma:
  - Activated macrophages (epithelioid histocyte)
  - Giant cells: multi nucleated. Formed by fusion of macrophages, to try to increase the engulfment of the microbial material
  - Many Scattered lymphocytes (dark)
- The most important components are macrophages and lymphocytes.

- The conditions that cause granuloma are limited.

- Causes of Granuloma:

  1-Immune Granuloma: Bacteria (TB most important + leprosy), Parasite.
  2-Non-Immune Granuloma: foreign bodies. Ex. Graft: taking something from a place and implanting it elsewhere.
  3-Unknown causes.

- [1] IMMUNE GRANULOMA: ex. TB
  - Cell mediated immunity,intracellular pathogen.
  - Ex.TB bacteria are air-bound , enter alveoli , macrophages attempts engulfment , they fail,
  - so they become APC , recruit T-lympccccccccchocytes, an immune reaction appears, T-cells produce chemical mediators: → IL-2: activates other T cells.
    →INF-λ: actives monocyte into macrophages.
    →TNF: stimulates monocyte to enter tissue.
  - Granuloma tries to isolate microbes to prevent spreading →protective mechanism.
  - May destroy tissue.

- [2] FOREIGN BODY GRANULOMA :
  - No immune response because foreign body is not lethal.
  - One single macrophage tries to engulf foreign body.

TUBERCULOSIS

- Caused by [mycobacterium TB]: doesn't produce toxins or spores (nor any protective method).
- However its uniqueness is in its special lipid cell wall (mycolic acid), which prevents the fusion of the phagosome (containing the bacteria) with a lysosome.

- [1]PRIMARY TB
  - During first time exposure.
  - Involves sub-pleura region, in middle and lower part of lung (not the upper).
  - Formation of [Ghon's complex] = Ghon's focus + lymphatic lesion.
  - When bacilli enter body (reaches blood stream), they are either:
    - Killed.
    - Dorm (hide) (asymptomatic) . When immunity decreases, reactivation of bacteria (Secondary TB).

- [2] SECONDARY TB
  - In a previously exposed host, or with high dose of bacteria.
  - Upper lobes involved (2^{nd}, 3^{rd}, etc exposure).
  - TB bacteria is aerobic, so it tries to move higher in lung to access more oxygen. That is why secondary TB is in the upper lobe of the lung.
  - "**IMPORTANT** " Caseous necrosis: only in TB, is its mark.
  - Necrosis in lung will try to erode bronchus, so bacterium comes out with sputum (infects others). When all caseation material is drained, a cavity is left (can be seen by x-ray).
  - If a blood vessel is eroded, the patient will cough up blood (Hemoptysis).

- [3] MILIARY TB (progressive)
  - In individuals with poor immunity (ex. Cancer patients), can be primary or secondary TB.
  - Not only the lung, but whole body (can be seen as beige spots).
  - Once it enters lymphatic system, it becomes wide spread
  - Once bacteria enters blood: 1) Miliary TB: deposited anywhere (millets).
    2) Deserated TB : deposited in a single organ (isolated).
  - In the spine black spaces are seen , because bone is lost.
  - Special stain for microscope used [Zeil Nielson]. (pink red bacteria seen).
  - PPD test (PCG/ tuberculin): Weakened bacteria used to determine if the person was exposed in the past to TB bacteria as a vaccine or disease (hypersensitivity type 4). Not a diagnostic tool.

LEPROSY

- Caused by [Mycobacterium Leprae]: transmitted via air to [skin + mucus membrane] (lives in cooler parts of the body surfaces + nerves)

- [1] LEPORMATOUS LEROSY:
  - Weak CMI.
  - No well formed granuloma, just a sheet of macrophages.
  - More bacteria seen.
  - Inter.
  - More lethal.
  - Disfigurement : can distort superficial parts of body (nose, lip)→leonine faces (lion like).
  - Stain for microscope[File Stain].

- [2] TUBERCULOID LEPROSY (looks like TB)
  - Strong CMI.
  - Granulomatous inflammation.
  - Granuloma=good immunity.
  - Less bacteria seen (have already been engulfed).
  - Intra.

- [3] INDETERMINANT LEPROSY
  - Intermediate CMI.

SCHISTOSOMIASIS (bilharzias)

- Parasitic.
- 3 types: 1- Heamatobium (Africa), 2- Mansoni (Latin America) 3- Japonicum (East Asia).
- In stagnant water (foul from standing) .
- Life cycle: 1/2 in water and 1/2 body.
- Eggs have different shapes. Important in diagnosis:
  1)Spike on the end (Heamatobium), 2)Spike on lateral (mansoni), 3) Rounded (japonicum)

- Life Cycle:
  1- Eggs hatch in the water → maricidia will form.
  2- Maricidia will penetrate snails and grow, giving sporocyst.
  3- Sporocyst grow in water →**[cercariae (infective stage)]** cannot be engulfed by macrophage because it makes a shell.
  4- Cercariae penetrates human skin, enters circulation, then liver; where it matures into male + female.
  5- The pair will migrate to mesenteric vein to lay eggs:
  → Heamatobium: to veins of urinary tract [in tests, eggs seen in urine].
  → Mansoni & Japonicum: to veins of GIT [in tests, eggs seen in faeces].
- In penetration site of cercariae, there is a skin infection (dermitis).
- Adult worms lay eggs, which cause a granulomatous inflammation.

- Clinical: liver→granuloma →fibrosis , which obstructs portal vein.
- "**IMPORTANT** " schistosomiasis in urinary tract →causes squamous cell carcinoma.

LEISHMANIASIS

- Parasite transmitted by sand fly from small animals (reservoirs), causes ulcers.

- Life cycle:
  1-Sand-fly bites, injects [amastigotes] infective stage →in blood macrophage engulfs it.
  2- Amastigote bursts macrophage,and enters circulation.

- Types : 1- visceral → involves organs (serious).
  2- cutanous → skin.
  3- mucocutaneous → junctions between mucous membrane and skin.

- Diagnosis : (L.M) macrophages, amastigotes (pink dots).

SARCOIDOSIS (no egg)

- Unknown etiology/cause (they know it`s immune, but not sure how exactly).
- The reason it's pathogenesis is linked to immunity: CD4 + antibodies (hypergammaglobulinemia) produced
- Systemic
- Seen in bilateral hilar lymph nodes of lungs, granuloma formation (hilum = a part of the lung)
- Organs involved: lung, lymph nodes, eyes.
- May lead to permanent blindness.
- Clinical manifestation : in X-ray →air = black , whitish = sarchoidosis (air can't reach it).
- Sarchoidosis **:** No caseating necrosis granuloma. [Remeber: caseating necrosis = TB)
- Prognosis: most cases respond to treatment (steroids).
- It may contain Schaumann bodies.

"What fits your busy schedule better, exercising one hour a day or being dead 24 hours a day?"