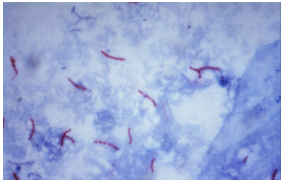
Airborne dis.



Mycobacterium Tuberculosis

- pleomorphic
- weakly gram +ve (ضعيف)
- curved rod.
- obligate aerobe ↗ upper lobes ↑oxygenation
- Facultative intracellular — inside Φ
- acid fast bacillus
  - + aryl methane dye → stable mycolate complex.
- slowly growing
  - 3-6 ws → visual colonies.

اذا مش حاضرين العلاج

<1 year: intra 30%, extra (disseminated) 10-20%

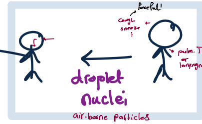
1 – 2: intra 10-20%, extra 2-5%

risk declines slowly until 10.

* Children usually develop TB within 2 years after exposure
  90% → within 1st year

droplet nuclei — air-borne particles 1-5 microns.

(forceful! cough, sneeze; pulm. TB or laryngeal TB)



alveoli (multiply here) → Blood stream → any part of body (brain, larynx, L.N, bone, spine, kidney)

2-8 ws ↓

Φ — ingest & surround it ⇓ Barrier ⇒ Granuloma

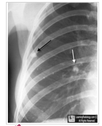
"LTBI"
- asymptomatic
- TST +ve
- IGRA +ve
- CXR → normal / healed
- culture → no M.T
- no clinical manif.

↑ risk to → TB dis:-
- HIV
- <5 yo
- M.T (past 2 ys)
- Hx ↗ untreated / inadequate
- immunosuppression ↗ TNF α Υ / steroid
- silicosis · DM · CRF · leukemia
- Gastrectomy
- weight < 90% of ideal
- smoking / alcohol.

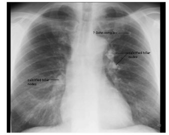
(child → weeks, adult → decades)

Tuberculosis disease
- clinical S&S
- CXR abnormal
- extrapulmonary manifestation

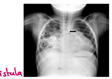
numerous # ↓ aggregate ↓ Ghon focus '1ry lesion' (pale yellow caseous nodule, mm → 1-2 cm, in periphery of lung) + MTB → Hilar LN → Ghon complex (subpleural or lower lobe) → Fibrosis, Calcification ⇒ Rankle Complex



1ry → asymptomatic
- +ve TST IGRA
- CXR → mild abn. (atelectasis, infiltrate) — Ghon complex.
- * middle lobe
- * delayed hypersensitivity → ↑L.N, malaise, low fever, erythema nodosa

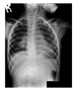


* Progressive 1ry infection → symptomatic (weight loss, fatigue, fever, chronic cough, + night sweat)
- progressive caseation → discharge into bronchus, disseminate further in the lung.
- rupture of focus → pleural cavity ⇒ pneumothorax, bronchopleural fistula, caseous pyopneumothorax

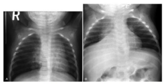


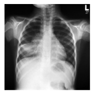
✓ • Pulmonary ⇒

* isolated Lymphadenopathy ← hilar, mediastinal, subcarinal.
  - ↳ hallmark in childhood.



* Bronchial dis.
  - # small caliber airway
  - ↑L.N
  - lymphobronchial involvement
  - bronchus ⇒ obstructed
  - mimic pertussis ← localized wheezing, persistent cough.

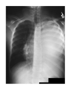




* Complicated L.N dis.
  - paratracheal → stridor / resp. distress.
  - subcarinal ↗ esophagus ↗ swallowing difficulty, eso. diverticulum; if ruptured → fistula

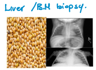
* Acute pneumonia

* Tuberculous pleural effusion
  - represent immune response to organism,
  - ↑ptn - lymphocyte - no bacilli.



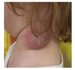
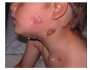
- Pleural TB results from :
- 1- the direct spread of caseous material from a subpleural parenchymal
- 2-lymph node focus
- 3- from hematogenous spread.
- Pleural TB is uncommon in children younger than 6 years of age and rare in those younger than 2 years of age.
- The clinical course associated with pleural involvement characteristically begins with acute chest pain, accompanied by high fever in the absence of acute illness, and a dry cough.
- The prognosis for children with tuberculous pleural effusion has always been good compared with other overt forms of TB, even before chemotherapy was available.

* Miliary TB (fever, malaise, weight loss, LAP, night sweats, hepatosplenomegaly)
  - hematogenous spread.
  - lesion size ⇒ millet seed.
  - * bilat. pneumonitis
  - * meningitis.
  - CXR → overwhelming infection
  - TST → nonreactive
  - Liver / B.M biopsy.



more in adult ← What manifestation to observe
- cervical adenitis (MC)
- FTT
- FUO
- meningitis
- ostemyleitis.

•Extrapulmonary ⇒ MC → TB of superficial LN (scrofula), CNS.

Scofula

- Meningitis
- osteoarticular
- abdominal
- GI
- cutaneous
- congenital.
  - * mimic → neonatal sepsis
  - * present with → hepatosplenomegaly, Resp. dis.

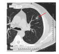
* Vitals
* Resp distress symp.
* ♡ → normal, unless → pleural effusion

* peripheral LAP → unilateral, painless, rubbery.

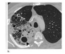
* Gold standard of Dx:- culture. → LJ media
  - high specificity
  - more sensitive
  - slow growing 8ws.

🔍 - CXR / CT

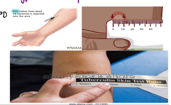
CT-scan



- CT scans may detect abnormalities suggestive of intrathoracic TB in a child suspected of having complicated intrathoracic lymph node or pleural disease, endobronchial lesions, bronchiectasis, or cavities that are not well revealed on plain radiography



- TST / mantoux test.
  - ε. T-cell mediated delayed hypersensitivity.
  - . Intradermal. 5TU of PPD



+ve → 2-3 ws after infection → up to 3 months
= infection

Induration≥5 mm (+)
1.Children in close contact with persons with known or suspected contagious tuberculosis disease
2.Children suspected to have tuberculosis disease
Findings on chest radiograph consistent with active or previously active tuberculosis
Clinical evidence of tuberculosis disease
3.Children receiving immunosuppressive therapy or with immunosuppressive conditions, including HIV infection
Induration ≥10 mm
1.Children at increased risk for disseminated disease
2.Children <4 yr of age
3.Children with other medical conditions, including Hodgkin disease, lymphoma, diabetes mellitus, chronic renal failure, and malnutrition
4.Children with increased exposure to tuberculosis disease
Children born, or whose parents were born, in high-prevalence regions of the world
Children frequently exposed to adults who are HIV-infected, homeless, users of illicit drugs, residents of nursing homes, incarcerated or institutionalized, or migrant farm workers
Children who travel to high-prevalence regions of the world
Induration ≥15 mm
Children ≥4 yr of age without any risk factors

مهم → <5 years of age.
MC screen for Latent TB.

-ve not rule out TB
مثلاً → HIV, malnourished.

* induration measured 48-72 hrs later.

Causes of false positive test
- Non TB microorganisms (mycobacterium)
- BCG vaccine

False negative
- Incorrect administration or interpretation of test
- HIV infection
- Viral infections (e.g. measles, varicella)
- Vaccinated with live viral vaccines (within 6 weeks)
- Malnutrition
- Immunosuppressive medications (e.g. corticosteroids)
- Primary immunodeficiency
- Diseases of lymphoid tissue (e.g. Hodgkin lymphoma, leukaemia, sarcoidosis)

- IGRA test
  - >5 years old
  - unaffected by vaccine.

- PCR
  - +ve → Not confirm
  - -ve → Not eliminate
  - So what! :)

Treatment :-

First-line agents	Second-line agents
Isoniazid (H)	Amikacin (AMK)
Rifampicin (rifampin) (R)	Capreomycin (CPM)
Pyrazinamide (Z)	Ciprofloxacin (Cip)
Ethambutol (E)	Cycloserine (CS)
	Ethionamide (Eth)
	Kanamycin (K)
	Ofloxacin
	P-aminosalicylic acid (PAS)
	Streptomycin (S)
	Rifabutin (Rif) ┐ for MAC
	Clarithromycin (Cla) ┘

Drug resistance - Definition

Drug Redistant TB: Mycobacterium tuberculosis bacilli resistant to at least one of the 1st line anti TB drugs, INH, RMP, Pyrazinamide or Ethambutol

Multidrug Resistant TB: Mtb resistant to INH and RMP

Extensively Resistant TB: Mtb resistant at least to INH, RMP plus any resistance to fluroqunolones and injectable anti TB drugs.

drug resistant ⇒ M.T resistant
لواحد على الأقل من

Latent ⇒ INH 6-9 months.

Pulmonary
6 months
- intensive ④ 2 months
- continuation ② 4 months INH RIF

Common side effects of TB drugs

Side effects	Drug(s) responsible
Minor	
Anorexia, nausea, abdominal pains	Rifampicin
Joint pains	Pyrazinamide
Burning sensation in feet	Isoniazid
Orange/ red coloured urine	Rifampicin
Major	
Skin itching/ rash	Streptomycin, Rifampicin, Isonazid
Deafness (no wax on otoscopy)	Streptomycin
Dizziness (vertigo, nystagmus)	Streptomycin
Jaundice (other causes excluded)	Isoniazid, Rifampicin, Pyrazinamide
Vomiting, confusion	Isoniazid, Rifampicin, Pyrazinamide
Visual impairment/ loss (permenant)	Ethambutol
Generalised purpura, shock and purpura	Rifampicin

Extrapulmonary. Same as pulm
بس
- osteotuberculosis ⇒ 9-12 month INH RIF
  - 6 months INH RIF in 1st 2 → + other
- meningitis
  - 2 months → intensive regimin
  - 7-10 months → INH RIF.

Hospitalization
- Resp. distress
- severe adverse event (ↄ toxicity)
- TB meningitis
- Miliary TB
- Spinal TB. → angulation or gibbus formation

BCG
live attenuated
Intradermal / upper arm → ulcer.
Single dose / infancy.