Tuberculosis update
68 year old NZ European male

• Hypoglycaemia
• Intermittent cough

• Background:
  – Type II diabetes
  – Cognitive impairment - MMSE 24/30
  – Gout
  – Hypertension
  – Renal impairment
Management

• Cognitive impairment / diabetes management
• Treated with IV cefuroxime
  – But persistent cough / fever

• Further investigations:
  – QuantiFERON-TB Gold - negative
  – Sputum - TB culture
    • 4+ AFB smear positive
    • Cultured *Mycobacterium tuberculosis*
  – HIV test - negative
Reported TB Cases in NZ, 2010

- 661 cases of TB notified
  - 304 cases of TB disease (new/relapse)
  - 357 cases of TB infection (treatment of latent TB)

- Annual notification rate TB disease: 7.0/100,000
  >50% of TB cases occur in the Auckland region

- 80% of TB disease cases born outside NZ

ESR. Annual Surveillance Report 2011
Natural History of TB infection

Exposure to TB

Not infected (70-90%)

Infection (10-30%)

Latent TB (90%): well
- never develop TB
- not infectious

Active TB (10%): ill
50% develop TB within 2 years
50% develop TB many years later

Time since infection
Age when infection occurs
Predisposing medical conditions

Untreated
50% die within 2 years

Treated
Cured
Clinical features of active TB

Cough (>2-3 weeks)
Weight loss
Fever / night sweats
Fatigue
Chest pain
Dyspnoea
Haemoptysis
Non-specific symptoms

1/3rd of TB cases are diagnosed after admission for unrelated complaint
Drug resistant TB

28 cases of MDR-TB have been identified during the last 10 years in NZ

- Prolonged treatment/ monitoring
- Large cost incurred
- Major impact to individual health

MDR TB = Multidrug resistant TB

Resistance to both isoniazid and rifampicin
## Impact of HIV on TB

<table>
<thead>
<tr>
<th>HIV status</th>
<th>Lifetime risk of developing TB</th>
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<tbody>
<tr>
<td>Negative</td>
<td>10%</td>
</tr>
<tr>
<td>Positive</td>
<td>&gt;30%</td>
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HIV infection is the most powerful factor known to increase the risk of TB

WHO 2004
Diabetes impacts on TB by.....

• Tripling the rate of developing active TB from latent TB infection

• Increasing mortality and severity of disease

• Slowing the response to effective TB treatment

QuantiFERON-TB Test
Interferon-γ release assay (IGRA)
QuantiFERON-TB Gold Test

• Advantages:
  – Only one visit required
  – Objective and reproducible
  – No cross reactivity with BCG, little cross-reactivity with non-tuberculous mycobacteria
  – Controls for low or no immune response
  – No risk of ulceration

• Disadvantages:
  – Blood must be received in lab within 12 hours
  – Labour intensive for the lab
  – Limited data for some patient groups
QuantiFERON-TB Test possible results

• **Positive**: TB infection
  – does not differentiate between TB disease and TB (latent) infection

• **Negative**: TB infection unlikely

• **Indeterminate**:  
  – Infection status cannot be determined
QuantiFERON-TB Gold

• Latent TB infection:
  – Sensitivity approximately 80%
  – Specificity >95%

Pai M et al. 2008

• TB disease
  – Sensitivity is reduced because of temporary anergy due to acute illness

Does not distinguish between latent TB infection or TB disease
A negative QuantiFERON-TB Gold does not exclude TB disease
Treatment for latent TB infection (LTBI)

1) Rule out TB disease
   - clinical examination, chest x-ray

2) 6 to 9 months of isoniazid (or 3RH) if indicated

But need to consider:

Risk of reactivation of TB

Risk of treatment
A 24 year old nursing student has a positive Quantiferon-TB Gold test

What advice do you give her?