CASE THREE

Short case number: 3_10_3
Category: Respiratory System
Discipline: Medicine
Setting: General Practice
Topic: Tuberculosis [SDL]

Case

Sahar Mahmoud, aged 41 years, is a refugee from Iraq. She travelled to Australia with the assistance of a 'people smuggler' and was in detention for a year. Recently she was granted a temporary visa. Today she presents to your general practice with a refugee advocate who is concerned about her chronic dry cough. Sahar states that she had a chest x-ray on arrival in Australia but doesn't know what it showed. However, the cough commenced about the same time that she arrived in Australia.

Questions

1. What further history & examination would you undertake in this case?
2. What investigations would you order?
3. Why might an X-ray on arrival in Australia have been reported as being normal if an X-ray today shows the classical appearance of TB infiltrates?
4. Why is the incidence of TB rising?
5. What factors are associated with an increased risk of acquiring TB?
6. In a table summarise the time from infection correlated against the clinical manifestations of TB.
7. List the chronic complications of TB.
8. What public health measures does the Australian government put in place to screen refugees and new migrants for disease? (PPH resource to answer)

Suggested reading:

- Colledge NR, Walker BR, Ralston SH, Penman ID, editors. Davidson's Principles and Practice of Medicine. 22nd edition. Edinburgh: Churchill Livingstone; 2014. Chapter 19.

ANSWERS

Tuberculosis

1. What further history & examination would you undertake in this case?

Pulmonary TB is the most frequent form of post-primary disease. The onset is typically insidious and develops slowly over several weeks. Systemic symptoms include fever, night sweats, malaise, loss of appetite and weight, and are accompanied by progressive pulmonary symptoms. Physical examination of the lung will usually have few findings. In extrapulmonary tuberculosis, signs like pleural effusion, pericarditis, cervical lymphadenopathy (may even have draining fistula) may be seen.

Clinical Presentations:

- Chronic cough, often with haemoptysis
- Pyrexia of unknown origin
- Unresolved pneumonia
- Exudative pleural effusion
- Asymptomatic (diagnosis on chest X-ray)
- Weight loss, general debility
- Spontaneous pneumothorax

2. What investigations would you order?

Specimen
Respiratory • Sputum* (induced with nebulised hypertonic saline if not expectorating) • Gastric washing* (mainly used for children) • Bronchoalveolar lavage • Transbronchial biopsy
Non-respiratory • Fluid examination (cerebrospinal, ascitic, pleural, pericardial, joint) • Tissue biopsy (from affected site; also bone marrow/liver may be diagnostic in patients with disseminated disease)
Diagnostic test

• Circumstantial (ESR, CRP, anaemia etc.)
• Tuberculin skin test (low sensitivity/specificity; useful only in primary or deep-seated infection)
• Stain
  ○ Ziehl-Neelsen
  ○ Auramine fluorescence
• Nucleic acid amplification
• Culture

    - Solid (Löwenstein-Jensen, Middlebrook)
    - Liquid (e.g. BACTEC)
- Response to empirical antituberculous drugs (usually seen after 5-10 days)

* 3 × early morning samples

3. Why might an X-ray on arrival in Australia have been reported as being normal if an X-ray today shows the classical appearance of TB infiltrates?

In the initial phase of the TB infection, the minimal infiltrates on the X-ray may not be discernible. Without any treatment, the disease will progress with increasing involvement of the lung parenchyma. Common radiological findings include fibro-nodular infiltrates with indistinct margins occurring in one or both upper lobes or the apices of the lower lobes and cavitation.

4. Why is the incidence of TB rising?

Current estimates suggest that around one-third of the world's population has latent tuberculosis and that between 2002 and 2020 an estimated 1000 million people will become newly infected, 150 million will contract disease, and 36 million will die.

Developed countries

- Immigration from high-prevalence areas
- HIV
- Social deprivation (homelessness, poverty)
- Increasing proportion of elderly
- Drug resistance

Developing countries

- Ineffective control programmes
- Lack of access to health care
- Poverty, civil unrest
- HIV
- Population increase
- Drug resistance

5. What factors are associated with an increased risk of acquiring TB?

Patient-related

- Age (children > young adults < elderly)
- First-generation immigrants from high-prevalence countries
- Close contacts of patients with smear-positive pulmonary tuberculosis
- Overcrowding: prisons, collective dormitories
- Chest radiographic evidence of self-healed tuberculosis
- Primary infection < 1 year previously

Associated diseases

- Immunosuppression-HIV, infliximab, high-dose corticosteroids, cytotoxic agents
- Malignancy (especially lymphoma and leukaemia)
- Type 1 diabetes mellitus
- Chronic renal failure
- Silicosis
- Gastrointestinal disease associated with malnutrition (gastrectomy, jejuno-ileal bypass, cancer of the pancreas, malabsorption)
- Deficiency of vitamin D or A

6. In a table summarise the time from infection correlated against the clinical manifestations of TB.

Time from infection	Manifestations
3-8 weeks	Primary complex, positive tuberculin skin test
3-6 months	Meningeal, miliary and pleural disease
Up to 3 years	Gastrointestinal, bone and joint, and lymph node disease
Around 8 years	Renal tract disease
From 3 years onwards	Post-primary disease due to reactivation or reinfection

7. List the chronic complications of TB.

Pulmonary

- Massive haemoptysis
- Cor pulmonale
- Fibrosis/emphysema
- Atypical mycobacterial infection
- Aspergilloma
- Lung/pleural calcification
- Obstructive airways disease
- Bronchiectasis
- Bronchopleural fistula

Non-pulmonary

- Empyema necessitans
- Laryngitis
- Enteritis*
- Anorectal disease*
- Amyloidosis
- Poncet's polyarthritis

* From swallowed sputum.

8. What public health measures does the Australian government put in place to screen refugees and new migrants for disease? (PPH resource to answer)