Tuberculosis (TB) conjures up different images to different people. Some may picture a person lying in an old-fashioned hospital bed, whereas others may recall charity video appeals on behalf of sufferers in developing countries. Those of a particular generation may remember being lined up with their classmates for an injection to stop them getting the disease. Few would picture a modern-day scenario involving patients in the UK.

But these beliefs are misguided. TB is the leading cause of death among curable infectious diseases and has been declared a global emergency by the World Health Organization, which estimates that one third of the world’s population is infected with Mycobacterium tuberculosis. In 2011, around 1.4 million deaths were attributed to TB. The UK is – quite literally – not immune, and there were nearly 9,000 cases reported in the country in the same year.

Although TB is spread by droplets – such as by a person with an active infection in their lungs coughing – it is not very contagious. This means that it tends only to be passed on to individuals living in close proximity to a sufferer and, even then, if the individual is in good health their immune system may well kill the bacteria.

In others the immune system isn’t quite as efficient and, although there aren’t any symptoms, the bacteria remain in the body. This is known as latent TB and may remain in this state for many years before the immune system becomes compromised (often by another condition such as HIV or diabetes, or treatment such as chemotherapy) and active TB develops.

**Symptoms and diagnosis**

*Mycobacterium tuberculosis* most commonly affects the lungs, causing pulmonary TB. The symptoms typically include persistent, productive coughing (sometimes with bloody phlegm), fever and night sweats. Symptoms such as dyspnoea, weight loss, anorexia and fatigue are usually mild to start with, but rapidly worsen as the TB develops.

In the UK, just under half of TB infections are extrapulmonary, ie occurring outside the lungs. This is more common in people who have had latent TB, rather than those who develop symptoms a short time after the initial infection. Extrapulmonary TB can affect many areas of the body, which influences the symptoms experienced:

- **Lymph node TB** causes painless but persistent swelling of the lymph nodes, most commonly in the neck
- **Skeletal TB** results in bone or joint weakness, curving and pain, with associated loss of movement or feeling
- **Gastrointestinal TB** often leads to diarrhoea, rectal bleeding and abdominal pain
- **Genitourinary TB** can cause dysuria, nocturia and blood in the urine, as well as groin pain
- **Central nervous system TB** is rare, with sufferers complaining of headaches, vomiting, neck stiffness, blurred vision and sometimes experiencing confusion or seizures.

Active pulmonary TB is diagnosed by performing a chest x-ray and analysis of at least three sputum samples (including one early morning sample). Diagnosis of extrapulmonary TB depends on the suspected site of infection, but may include a computerised tomography (CT), magnetic resonance imaging (MRI) or ultrasound scan, blood and urine tests, biopsy, aspiration or a lumbar puncture.

Screening is performed if latent TB is suspected. The most common method used is the Mantoux test, in which a tuberculin purified protein derivative is injected into the skin of the inner forearm. A positive result is obtained if a skin reaction occurs within a couple of days. This is usually followed up with a test called an interferon gamma release assay (IGRA), though in some areas and for some patients only the IGRA may be carried out.

**Management**

If active pulmonary TB is suspected – and the patient should have been referred to a specialist TB team if this is the case – treatment should be initiated while test results are being processed. The usual treatment is a two-month course of daily isoniazid, rifampicin, pyrazinamide and ethambutol (this is known as the initial phase) followed by four months of daily isoniazid plus rifampicin (the continuation phase).

Combination preparations are available to improve medication adherence, and a three-times-a-week regimen can be used for individuals requiring supervision, such as the homeless or those with a history of poor medication adherence. After two weeks of treatment, the patient is no longer considered contagious.

During this initial treatment period, hospitalisation is only needed in exceptional circumstances such as homelessness, and contact tracing should be conducted if it is not already under way.

Extrapulmonary TB is often treated using the same drug regimen as pulmonary TB, though individuals with CNS or pericardium involvement are usually also prescribed prednisolone, initially at a high dose, which is reduced gradually. Surgery may be performed for patients with lymph node and, occasionally, skeletal TB.

Only certain patient groups with latent TB

**Box 1. Tuberculosis hot spots**

There are several parts of the world that have high rates of TB, including:

- Sub-Saharan and west Africa, though the whole continent is affected
- South-east Asia
- China
- South America
- West Pacific region (Vietnam and surrounding area)
- Russia
are treated, such as those who are under 35 years of age, HIV positive, about to embark on immunosuppressant medication or therapy (as this increases the risk of latent TB becoming active) or who are healthcare workers. For others, the risk of treatment – particularly hepatic damage – outweighs the benefits. Treatment usually involves isoniazid plus rifampicin for three months, or isoniazid monotherapy for six months.

Antibiotic-resistant TB is relatively common – in 2011, more than eight out of 100 cases were resistant to at least one of the treatment antibiotics usually used - but is not normally an issue as other antibiotics can be employed, such as streptomycin instead of isoniazid.

However, there are TB strains that are now resistant to two antibiotic agents (known as multi-drug resistant or MDR-TB) or even three or more antibacterials (also known as extensively drug resistant or XDR-TB). Such patients need specialist management, and the treatment often lasts more than 18 months. Unlike normal active TB, patients with suspected or known infectious MDR-TB or XDR-TB often require hospitalisation and will be treated in isolation by mask-clad staff until the patient becomes non-infectious or non-resistant.

Several of the drugs used to treat TB (isoniazid, rifampicin and pyrazinamide) can cause liver toxicity, so hepatic function should be assessed before initiating treatment. Further checks are only required for those with pre-existing liver problems or if warning signs (such as fever, malaise, vomiting or jaundice) occur. Similarly, renal function should also be checked before starting anti-tuberculosis therapy, as should eyesight due to the potential side effects of ethambutol, which can include visual field disturbances, colour blindness and loss of visual acuity. Isoniazid can cause peripheral neuropathy, though this tends to affect those with a pre-disposition such as diabetes, and high-risk individuals should be given concurrent pyridoxine.

Once treatment has been completed, TB patients are not usually followed up, although they should be counselled to seek advice if they experience any signs of a relapse. An exception is made for patients with MDR-TB or XDR-TB, who are followed up for at least 12 months after treatment.

The role of community pharmacy

Medication adherence is a huge issue for those on treatment, mainly because of side effects and the duration for which drugs have to be taken. This is particularly problematic because symptoms often resolve quite quickly after starting the antibiotics. Pharmacists and their staff are ideally placed to encourage adherence in several ways:

- Providing medication in a form that the patient finds acceptable, for example liquid preparations for children or those with swallowing difficulties, or combination products to reduce the number of preparations being taken.
- Supplying information about side effects, particularly signs of liver or kidney toxicity and visual problems, and offering reassurance about the characteristic red-orange colour that rifampicin imparts to body secretions including urine, sweat and tears (which can stain soft contact lenses).
- Informing patients about appropriate methods of contraception due to the rifamycins reducing the effectiveness of hormonal methods.
- Providing compliance aids such as medication diaries.
- Informing patients who pay for their prescriptions about prepayment certificates to lower the financial burden of treatment.
- Emphasising the importance of taking medication for as long as prescribed by supplying relevant and appropriate advice on bacterial resistance and its implications for the patient and others.
- Reassuring patients who are anxious about their infection recurring that the chance of this happening is slim, while reminding them to be on the lookout for symptoms that indicate they may have relapsed.

The other area in which pharmacy can play an important role is prevention. Although the Bacillus Calmette-Guérin (BCG) vaccine is not included in the routine childhood immunisation schedule, it should be given to any baby who is at risk of coming into contact with TB. This could be due to parents or grandparents who were born in a country with a high rate of the disease (see Box 1 on the previous page) or because they live in an area with a high TB rate. Different areas deal with this in different ways, with certain places – such as inner cities where TB rates are relatively high due to high levels of immigrants – offering it to all newborns.

The vaccine should also be provided to anyone under 16 years with a family background as already described or who has been in close contact with a pulmonary TB sufferer. Anyone under 35 years who has come from an area where TB is prevalent or whose work puts them at increased risk of contracting TB such as laboratory, hostel, prison and care home staff should also be offered vaccination. BCG is not routinely offered to those over 35 years as there is little evidence that it provides protection if given later in life, nor should repeated vaccinations be administered.

More information

- Nice guidance on the diagnosis, management and prevention of TB is available at www.nice.org.uk/CG117.

- General information for patients is available from NHS Choices at http://tinyurl.com/tuberculosis.

- Information on the UK incidence of TB is available from the Health Protection Agency (now part of Public Health England) at www.hpa.org.uk/MigrantHealthGuide/HealthTopics/InfectiousDiseases/Tuberculosis.

- There are a number of organisations that support TB patients and/or are dedicated to combating the disease, including TB Alert (www.tbalert.org) and Target Tuberculosis (www.targettuberculosis.org.uk).

- Travellers requiring vaccination against TB is outside the scope of this article, but relevant information is available from Health Protection Scotland at www.fitfortravel.nhs.uk/advice/disease-prevention/tuberculosis.aspx.

Tips for your CPD entry on tuberculosis

Reflect What other parts of the body, apart from the lungs, can be affected by TB? Which antibiotics are used to treat TB? What are the side effects of antituberculosis treatments?

Plan This article describes tuberculosis and contains information for pharmacists about incidence, symptoms, diagnosis and treatment. The role of the pharmacist in the management of TB is also discussed.

Act Read the article and the suggested reading (below), then take the 5 Minute Test. Update and Update Plus subscribers can then access their answers and a pre-filled CPD logsheet.

Read more about tuberculosis on the NHS Choices website http://tinyurl.com/tuberculosis1

Revise your knowledge of the drugs used to treat TB and their doses from the BNF Section 5.1.9 Antituberculosis drugs

Think about the advice you could give to patients about TB treatments and side effects. Research for any information leaflets or charities providing information and support

Read the MUR tips for isoniazid and rifampicin on the C+D website http://tinyurl.com/tuberculosis2 http://tinyurl.com/tuberculosis3

 Evaluate Are you now confident in your knowledge of tuberculosis and its treatment? Could you confidently give advice to patients about compliance and side effects?
CPD Zone Update

5 minute test

Sign up to take the 5 Minute Test and get your answers marked online: www.chemistanddruggist.co.uk/update

Take the 5 Minute Test

1. In 2011 around 3,000 cases of TB were reported in the UK. True or false?
2. Countries with high rates of TB include China, South America and Russia. True or false?
3. The usual treatment for TB is a four-month course of isoniazid, rifampicin, pyrazinamide and ethambutol. True or false?
4. After two weeks of treatment, a patient with TB is no longer considered contagious. True or false?
5. In 2011 more than eight out of 100 cases of TB were resistant to at least one of the treatment antibiotics usually used. True or false?
6. For antibiotic-resistant TB streptomycin can be used instead of isoniazid. True or false?
7. Renal function, hepatic function and eyesight should be checked before initiating TB treatment. True or false?
8. Isoniazid can cause peripheral neuropathy. True or false?
9. After completion of treatment, most TB patients are followed up for a further three years. True or false?
10. The BCG vaccine is included in the routine childhood immunisation schedule. True or false?