Tuberculosis – role of the practice nurse

Ireland has a very low incidence of TB but that is no reason for complacency, as even one infected person can in turn infect 10 to 15 people per annum.

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Tuberculosis (TB) remains a significant cause of morbidity and mortality globally. It is estimated that a third of the world’s population is infected with TB and that 10% may go on to develop active disease at some stage in their lifetime. In 2008, 9 million new cases of TB, and 1.7 million deaths, were reported globally. Ireland has one of the lowest TB incidence rates in Western Europe with an incidence of ~11/100,000 pop/year. With less than 500 new cases in Ireland per annum, TB is not seen every day in general practice. However we should not be complacent about this infection; if left untreated a patient with active TB can infect 10 to 15 people in a year. Recent reports from India highlight the risk of total drug resistance developing from inadequate treatment received by patients. Effective treatment is essential both for the survival of individual patients, to control the spread of TB, and to minimise the impact of multi-drug resistant TB.

Transmission
Tuberculosis (TB) is a disease caused by infection with bacteria (bacilli) of the Mycobacterium tuberculosis complex group. It is spread via airborne particles called droplet nuclei, expelled when a person with infectious TB coughs, sneezes, shouts, or sings. Transmission occurs when droplet nuclei inhaled, reach the alveoli of the lungs, via nasal passages, respiratory tract, and bronchi. A small number of tubercle bacilli can enter the bloodstream and spread throughout the body. The tubercle bacilli may reach any part of the body, including areas where TB disease is more likely to develop (such as the brain, larynx, lymph node, lung, spine, bone, or kidney). Within 2 to 8 weeks, macrophages ingest and surround the tubercle bacilli. The cells form a barrier shell, called a granuloma, that keeps the bacilli contained and under control (LTBI). If the immune system cannot keep the tubercle bacilli under control, the bacilli begin to multiply rapidly (TB disease). The majority of cases involve the respiratory system.

Consider TB in your differential
Consider TB as a differential in general practice, if your patient has a cough for longer than 3 weeks, haemoptysis, night sweats or weight loss. TB is not prejudiced and can affect anyone, but there are people who are more vulnerable due to a higher risk of exposure and/or co-morbidities (see Table 1). Additionally the proximity, frequency, and duration of exposure, the air concentration and the Infectiousness of person with TB (i.e., number of bacilli TB patient expels into the air), all play a part.
Persons at higher risk for exposure to, or infection with, TB

- Close contacts of person known or suspected to have active TB
- Foreign-born persons from areas where TB is common
- Persons who visit TB-prevalent countries
- Residents and employees of high-risk congregate settings
- Healthcare workers who serve high-risk clients
- Populations defined locally as high risk for infection or disease, such as medically underserved, low-income persons who abuse drugs or alcohol
- Children and adolescents exposed to adults at increased risk for infection or disease
- Those on prolonged high-dose corticosteroid or immunosuppressants
- Certain medical conditions including diabetes mellitus, chronic renal failure, malignancies

Table 1. Persons at higher risk for exposure to, or infection with, TB

<table>
<thead>
<tr>
<th>Investigation</th>
<th>Description</th>
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<tbody>
<tr>
<td>Chest x-ray</td>
<td>A diagnostic test for TB</td>
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<tr>
<td>Sputum</td>
<td>Samples taken for culture and sensitivity tests</td>
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<tr>
<td>Mantoux test</td>
<td>A skin test to detect TB infection</td>
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</table>

TB tests should ideally be started in general practice. Speed of diagnosis reduces the risk of infection spread and out ruling TB prevents unnecessary referral to hospital services. A chest x-ray (posterior-anterior) is the initial step in assessing a patient with TB symptoms. If the chest x-ray is abnormal sputum samples should be collected. TB culture must be specifically requested as TB is not tested for routinely when (C&S) culture and sensitivity is requested. The results are only as good as the quality of the sample provided. When sending sputum samples to the lab ensure there is an adequate sample amount of 5mls and send the sample within 24 hours of collection. The best results are achieved when the patient produces 3 early morning samples on 3 consecutive days. The sputum smear result is usually available within 24 hours but the culture and sensitivities can take many weeks.

Having test results before or during that first consultation is of immense benefit. If TB is out ruled it may be more appropriate to refer to general respiratory clinic. Even if a TB specialist referral is necessary, the information is invaluable when prioritizing patient appointments. For example a patient with possible TB on chest x-ray will be given an urgent appointment. In cases with normal chest x-rays, culture and smear negative sputum but a positive Mantoux the patient may be given an appointment for the latent TB clinic.

If sputum samples are smear negative (the patient is less infectious). Knowing the smear result at the first clinic will guide the staff as to the need for the patient to wear a mask while in clinic. This is an important infection control measure. TB medications are not commenced until a sputum sample is sent because the sample will be tested for drug sensitivities, therefore sending samples from general practice gets the patient started on treatment sooner. It can take up to 8 weeks to have the final sputum culture results so the earlier sputum is sent to the lab the better.

Mantoux skin test is an aid to the diagnosis of TB. It is an intradermal injection of purified protein derivative (PPD), derived from tuberculin. An infected person’s immune cells recognize TB proteins in PPD and respond by causing a wheal to rise at the injection site. Reading and interpretation of TST reaction must be done within 48-72 hours. Interpreting the Mantoux skin test is based on the size of the reaction, and the patient’s history. If not involved in Mantoux skin testing regularly, measurement and interpretation can be difficult.

Support

The role of the practice nurse in TB does not end when a patient is referred to a specialist clinic. The majority of patients have their TB management as outpatients and may require additional support from the community healthcare providers and general practice may be a centre to facilitate this care.

Ongoing support can help the patients deal with the stigma associated with TB. The stigma of TB remains an issue for some who prefer not to disclose their diagnosis to others. Patients at our TB clinic have refused to have a nurse call to their homes where neighbours may question why they are visiting. Others refused to use interpreters as they feared members of their own ethnic community hearing of their diagnosis.

Combination therapy is used to treat TB for a minimum of 6 to 9 months and contains Isoniazid and Rifampicin plus Pyrazinamide (for the first 2 months) plus Ethambutol until sensitivities are confirmed. General practice is often the first port of call for patients experiencing side effects. They may be unaware that symptoms they are experiencing are as a result of TB medications. Familiarity with TB drug side effects can assist in providing advice to patients. If side effects occur advise the patient to hold their TB medication and contact the TB clinic immediately. The patient should avoid alcohol and paracetamol at all times when on TB medication to reduce hepatic complications. LFT’s are frequently taken when patients experience side effects. Common side effects are outlined in Table 2.

Table 2. Common side effects of TB drugs

<table>
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<tr>
<th>Rifampicin</th>
<th>Isoniazid</th>
<th>Pyrazinamide</th>
<th>Ethambutol</th>
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<tbody>
<tr>
<td>Allergic reactions</td>
<td>Allergic reactions</td>
<td>Allergic reactions</td>
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<tr>
<td>GI disturbance</td>
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<td>Hepatitis</td>
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<td>Bleeding problems</td>
<td>Peripheral neuropathy</td>
<td>Increased uric acid</td>
<td>Retrobulbar neuritis</td>
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<td>Discoloration of body fluids</td>
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<td>Sun sensitivity</td>
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<td>OCP Efficacy</td>
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Whilst providing support and monitoring side effects, another role that the practice nurse can offer is smoking cessation advice. Smoking is associated with a prolonged period of infectivity and requirement for longer course of treatment. One of the most challenging elements of TB management in Ireland is ensuring adherence to the course of antibiotics. Most TB patients have their disease managed as an outpatient and complete their course of antibiotics, albeit a long course, without any difficulties. A small number of patients adhere poorly to the regimes and this group is more likely to experience prolonged illness, disability, future relapse and even possible death or develop Multi-drug resistant (MDR-TB). The World Health Organization recommends that every patient receive Directly Observed Therapy (DOT). This means that a health care worker watches the patient swallow every dose of the prescribed TB drugs. However, there are not enough public health resources in Ireland to achieve this goal, so we have to think outside the box when it comes to providing this service. Traditionally DOT’s has been provided in the patient’s home by the Public Health Nurse. DOT’s can be carried out in any venue: in a clinic, the home or at the roadside and by a variety of health care professionals: practice nurses,
pharmacists or other responsible person. Studies have shown improved cure rates and less drug resistance when DOT’s programmes are in place.

Infection control
If a patient is attending a busy general practice and is suspected of having TB it is advisable that they are not left waiting in the waiting area with others. They could be seen first or asked to attend at the end of the day. Good respiratory hygiene is important. The patient can be asked to wear a surgical mask or cover the mouth and nose with a tissue when coughing. The risk of infection greatly diminishes when the patient is two weeks on treatment. The TB clinic will give the patient specific advice about people and places to avoid until non infectious.

Summary
The role of the practice nurse should not be under estimated in the care of a TB patient. He/she can recognise possible TB cases, in particular high risk individuals, act quickly to get chest x-ray and sputum tests, support patients during ongoing treatment by monitoring side effects, providing DOT’s and being an alternative point of contact in the health care system.

References

The stigma of TB remains an issue for some who prefer not to disclose their diagnosis to others.

Correspondence: Totally Drug-Resistant Tuberculosis in India. Clinical Infectious Disease, 2011:0 (15th October)

Recommended Reading

TB School / TB Study Day
Friday 19th October 2012, 9.00 to 16.00 hrs
Centre for Learning & Development, St. James’s Hospital, Dublin 8

This is the opportunity to participate in an intensive full day education and training programme related to the clinical aspects of TB. The programme will be facilitated through a combination of lectures & workshops.

The programme is open to all health care professionals involved in the care of patients with TB. It will be of particular interest to Respiratory Physicians, Doctors and Nurses working in public health, infectious diseases, general practice, specialist centres and institutions where TB incidence rates are high.

Cost: Doctors & other HCP’s €100, nursing staff €75, free to SJH staff
Includes refreshments and lunch / See registration form for payment details.

Programme Credits: 6 CME’s RCPI & ABA category 1 Approval / 5 CEU’s

Conference updates: http://www.stjames.ie/GPsHealthcareProfessionals/ConferencesCourses/2012/TB.pdf

Programme Organisers: Dr Anne-Marie McLaughlin and Ms Maria Kane, St James’s Hospital, Dublin 8

Enquiries to: Ms Maria Kane, Ph: 01 4284716, Email: mlawlor@stjames.ie
Bookings through: The Centre for Learning & Development – cld@stjames.ie or call 4162200/1/2