Tuberculosis and Air Travel

Introduction

This document is aimed at general practitioners, public health nurses, respiratory and infectious diseases specialists. Readers are referred to the WHO *Tuberculosis and air travel: guidelines for prevention and control (3rd edition)* for detailed guidelines on this issue. The following two scenarios set the scene for common issues relating to tuberculosis

Scenario 1: *Patients receiving treatment for TB may wish to undertake air travel. How do you decide whether they pose a public health risk by doing so?*

Scenario 2: *Your patient has recently been diagnosed with active pulmonary tuberculosis after being investigated for a six month history of chronic cough. He mentions that he flew to England to visit relatives two months ago. What should you do now?*

Patients who are under treatment for TB may tell you that they intend to travel overseas, or may make travel arrangements without consulting their treating physician. Over 90 per cent of new TB cases seen in Victoria are in people born overseas. Many of these cases occur during short-term visas and in people likely to want to travel during their treatment period. Issues of concern are the risk of transmission of TB to other passengers, as well as continuity of anti-TB treatment for the patient.

Risk of Transmission of TB

Overall, risk of TB transmission during airplane travel is low (1). There have been several documented cases of patients with pulmonary TB travelling on airlines, some of which have produced evidence to suggest transmission of TB to susceptible passengers and flight crew (2) (3), and some of which have failed to demonstrate transmission (4, 5)To date, there have been no reported cases of active TB disease following exposure during air travel. The likelihood of transmission of TB depends on a number of factors, including the infectiousness of the index case, susceptibility and vulnerability of those exposed, degree of exposure (duration and proximity), and adequacy of cabin ventilation.

The Characteristics of the Index Case

Pulmonary and laryngeal TB are infectious, whereas extra pulmonary TB (such as lymph node, genitourinary, bone or meningeal TB) carries negligible risk of transmission. In addition, the level of infectivity of a case of pulmonary TB is determined by whether the sputum is culture positive, whether the sputum is smear positive, the degree of smear positivity (indicating bacterial load) and whether a cavity is present on chest radiograph (CXR). Culture positive, smear positive, cavitating pulmonary disease and laryngeal disease are highly infectious.

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The following score for infectivity can be used to classify cases:

0	**Negligible**	Extra pulmonary TB, sputum culture and smear negative pulmonary TB
1	**Low**	Sputum culture positive & smear negative, bronchial washings smear positive, no cavitation on CXR
2	**High**	Sputum smear positive and/or cavitation on CXR

In general, a patient with pulmonary TB who complies with therapy and who is shown not to have drug resistant disease should become non-infectious after two to three weeks of appropriate anti-tuberculous therapy.

The Degree of Contact with the Case

People in casual contact with infectious patients are at low risk. Continuous, close contact (such as living in the same household) is associated with high risk. Therefore a long flight poses more risk than a short flight. Total flight duration of more than eight hours duration is associated with increased exposure and therefore a risk of transmission of *M. tuberculosis* (6). Total flight duration includes the flight time and any ground delays after boarding and before disembarking the flight. There is also evidence that the risk of transmission is related to proximity to the infectious case (3). Contact tracing can be limited to passengers sitting in i) the same row, ii) the two rows in front of, and iii) the two rows behind the TB index case. It is not necessary to perform contact tracing of passengers who are separated from the index case by a solid bulk-head. Where the index case is a passenger, contact tracing of cabin crew is generally not required, except in unusual circumstances such as when a cabin-crew member has been designated to look after a passenger subsequently diagnosed with infectious TB. If the index case is a member of the cabin crew or flight-deck personnel, contact tracing should include all work colleagues who were potentially exposed, but generally does not include passengers.

Recommendations

Infection Risk and Fitness to Travel

A person with untreated infectious TB should not travel by aircraft on a flight of any duration. A person with drug-susceptible pulmonary or laryngeal TB should have at least two and preferably three weeks of effective anti-tuberculous treatment, clinical improvement, and three consecutive negative sputum smears (performed on separate days) before being allowed to fly. A person with MDR-TB or XDR-TB will require a longer period of effective anti-tuberculous treatment, satisfactory clinical response to treatment, and sputum-culture conversion to negative before being allowed to fly. Patients with extra-pulmonary TB carry negligible risk of infectivity, but should normally also be commenced on effective anti-tuberculous treatment before travelling.

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What to Do if a Patient Informs You That They Intend to Travel

The decision to allow a patient on anti-tuberculous treatment to travel should be made on an individual basis, and should be discussed with the TB program of the Department of Health.

The patient should not travel until the above 'fitness to fly' criteria have been met. In addition, they should be encouraged to postpone travel until at least one month of treatment has been successfully completed so that antibiotic sensitivities are available and any adverse reactions to medications have been identified.

Patient compliance and commitment to therapy should be assessed, and patients who are at risk of non-compliance should be discouraged from travelling, especially early in their course of treatment. Patient education and counselling is important to ensure maximal compliance.

If a patient on anti-tuberculous treatment advises you that they intend to travel, it is important that the TB program be informed (tel: 03 9342 9478) to ensure continuation of treatment, including appropriate medication supplies and follow up. Arrangements should be made for overseas follow-up, if possible. A letter from the treating clinician outlining the person's clinical condition and required treatment is helpful.

Contact tracing

The risk *M. tuberculosis* transmission on aircraft is low. Approximately 15-25 cases of active tuberculosis with recent air travel are notified to the Department of Health (DH) each year. The TB Program undertakes contact tracing to identify persons who may have been infected by the index case and who require medical evaluation, treatment and follow-up. Potential contacts receive information and a request for LTBI testing by Victorian residential details provided to airlines. There are a number of barriers to successful contact tracing on airflights including difficulty in obtaining passenger lists and/or provision of contact details and a poor response rate is observed from individuals contacted. There are also frequent difficulties in ensuring appropriate clinical follow up, including interpreting a positive Mantoux or IGRA screening test in contacts who may have prior history of residence in higher TB incidence settings and have not been previously tested, and conducting break of contact testing in short-term visitors.

Recent air travel by cases of TB (within 3–6 months prior to diagnosis) should be reported to Department of Health on (03) 9342 9478.

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