Tuberculosis: Latest NZ Research and Some Auckland Perspectives

Two recent papers in the New Zealand Medical Journal confirm that New Zealand's tuberculosis prevention and control efforts have been reasonably effective, with the incidence rate remaining stable at around 10 cases per 100,000 people since the mid-1980s (Das et al, New Zealand Medical Journal, Vol. 119, 13 October 2006).

The researchers analysed data for the period from 1995 to 2004. While both studies confirmed that the majority of tuberculosis (TB) cases were in recently arrived immigrants from countries where there is a high incidence of TB, there was no evidence that migrants and refugees were spreading the disease to New Zealand-born people to any significant degree.

A positive finding was that TB rates in most New Zealand-born population groups are static or declining. The rate in young European New Zealanders has now dropped below 0.5 cases per 100,000 for Europeans under 40 years of age. The study authors commented that this is probably the lowest TB rate in New Zealand's history.

However, TB incidence rates remain disproportionately high in Maori and Pacific people. The occasional outbreaks of TB in New Zealand predominantly affect Maori and Pacific people. The authors said that the persisting high rates of TB in young Maori and Pacific people are possibly the most concerning findings, as they show a lack of success in breaking the cycle of ongoing TB transmission within these communities. These health inequalities will need to be addressed if TB incidence is to be reduced in our society as a whole.

The researchers concluded that there is scope for further reduction in the incidence of TB in New Zealand. Stricter migrant screening policies and procedures (introduced in November 2005 by New Zealand Immigration Service) are expected to help reduce the rate in the long term. However, since at least one third of the world's population is asymptomatic but infected with TB (latent TB infection or LTBI), TB will continue to be a challenge for immigration services and those caring for migrants. Recent outbreaks of TB in Palmerston North and Christchurch show that efforts to control TB in New Zealand need to be ongoing. Prompt diagnosis and treatment remains the key control measure in limiting the spread of TB.

Selected key findings from the research (Das et al, New Zealand Medical Journal, Vol. 119, 13 October 2006):

- Despite recent highly publicised outbreaks in Palmerston North and Christchurch, the rate of TB in New Zealand has not risen in recent years. The current NZ rate of TB is 8.2 per 100,000 (for the 12 months up to and including August 2006). Comparative rates were 9.3 per 100,000 in 2005, 10.0 per 100,000 in 2004, 11.3 per 100,000 in 2003, 10.3 per 100,000 in 2002, 10.0 per 100,000 in 2001 and 9.8 per 100,000 in 2000.
- TB rates in NZ are slightly lower than in the UK (12 per 100,000) but higher than the rates in Australia, Canada and the USA (5 to 6 per 100,000).
- New Zealand TB incidence rates vary enormously according to ethnicity. While Europeans have the lowest age standardised rate (2.0 per 100,000), people of ‘Other’ ethnicity (non-European, non-Maori and non-Pacific) have the highest rate (73.1 per 100,000), and Maori (21.1 per 100,000) and Pacific people (44.8 per 100,000) have rates in between. Compared to the rate in Europeans, the rates of TB in Maori, Pacific and people of ‘Other’ ethnicity were approximately 10, 22 and 36-fold higher, respectively, between 1995 and 2004.
- Comparing 2000-2004 with 1996-1999, TB rates decreased significantly for Europeans and people of ‘Other’ ethnicity, while there was no such decrease for Maori and Pacific people.
- TB incidence rates increase with socio-economic deprivation, being 4 times higher in the most deprived 20% of areas compared with the least deprived 20% over the 2000-2004 period.
- TB incidence rates generally increase with age. A higher-than-average rate was seen in two age-groups – in elderly people > 70 years (14.5 per 100,000) and in young adults 20-29 years of age (18.0 per 100,000) for the 2000-2004 period.
- In New Zealand, 64.6% (about two thirds) of people with TB were born overseas, with 60% of TB occurring in people who had migrated from high-tuberculosis-incidence countries in Asia, Africa and the Pacific. Migration of infected people from these high incidence countries, and subsequent development of TB disease in a minority of these people with LTBI, was found to be the driving force behind the non-decline in the incidence rate.
Migrants did not spread TB to NZ born people to a significant degree. This conclusion is based on the continuing decline in TB rates in the NZ born population despite an increase in the number of migrants with TB in NZ.

HIV/AIDS and multi-drug resistant TB (MDR-TB) are not significant contributors to the incidence of TB in New Zealand. Only 1.2% (45/3,772) of TB cases notified over 1995-2004 were also infected with HIV.

The case-fatality and mortality rate from TB is decreasing in New Zealand. Over the 1995-99 period 8.0% of cases died, decreasing to 5.3% in 2000-2004.

Transmission of animal TB (Mycobacterium bovis) from infected animals (e.g. possums) to humans is not a significant issue here, accounting for only 2.7% of cases over the 1995 to 2002 period.

**What is different in Auckland:**

- Auckland has around half of the total number of TB cases in New Zealand every year (even though it has only one third of the population). The median annual number of TB cases in Auckland from 1995 to 2004 was 184 cases annually (range 171-243 cases annually). The TB rate in Auckland is therefore higher than in the rest of New Zealand (NZ minus Auckland) and New Zealand as a whole (total): TB rates in 2004 were 15.1 per 100,000 in Auckland, 7.5 per 100,000 in the rest of New Zealand and 10.0 per 100,000 in New Zealand (total).
- In Auckland, around 75% of TB cases occur in people who were born overseas (compared with 64.6% of cases occurring in overseas-born people in New Zealand as a whole).
- Percentages of overseas-born TB cases for the three Auckland DHBs for the period 2000-2004 (estimates calculated from a table in one of the papers) are as follows: Auckland DHB: 87% overseas-born (increased from 82% during the period 1995-1999), Waitemata DHB: 76% overseas-born (increased from 71%) and Counties Manukau DHB: 65% overseas-born (increased from 59%).

**Key messages for GP’s and practice nurses in Auckland:**

- GP’s and practice nurses in Auckland are much more likely to see TB cases in their practices than primary care colleagues in most other parts of New Zealand.
- Prompt diagnosis and treatment remains the key control measure in limiting the spread of TB - it is important both to cure patients, and to limit further transmission of infection and outbreaks.
- Consider the possibility of TB whenever any patient presents with alarm symptoms for pulmonary TB: chronic cough (often productive) lasting three weeks or more, haemoptysis, unexplained weight loss, and unexplained fevers and severe night sweats.
- Extra-pulmonary TB also needs to be seriously considered in any recent migrant (of any age) who is afebrile but has a single persistently enlarged (often cervical) lymph node.
- Remember that TB rates are highest among people of ‘Other’ ethnicity, followed by Pacific, then Maori, and lowest among Europeans.
- A high index of suspicion is especially important if a patient has migrated to New Zealand from Asia, the Pacific nations or any developing country within the previous five years. The New Zealand Immigration Service introduced stricter medical and chest X-ray policies and procedures in 2005. However, it cannot be a total solution, as the present screening is only to detect TB disease. At the time of migration, many migrants only have LTBI and cannot be detected by present immigrant screening. Therefore, every year a small proportion of migrants with LTBI will go on to develop the disease months or years after arrival in New Zealand.

**File Notes and Prescriptions**

Ideally GP’s should have a system to mark the files of patients who are at higher risk of TB disease because they are:

1. known to be Mantoux positive
2. have had past treatment for TB disease
3. have a family history of TB
4. have lived in a high incidence country.

And finally – a note of caution! TB drugs are all specialist only medications. However, ARPHS is aware of a few cases where people with TB disease or LTBI have come into New Zealand from overseas with a supply of TB medication, have not been notified to ARPHS on arrival, have therefore taken their medication completely unsupervised by an ARPHS Public Health Nurse or Medical Officer, and then request a repeat script from a GP.

If any patient presents to a GP with TB medication, or requests a script (or repeat script) for TB medication:

Please do not prescribe but notify promptly to ARPHS on 623-4600, for appropriate public health follow up.
Dengue Fever Outbreak in Cook Islands

There have been around 170 cases of dengue fever in the past few months in the Cook Islands.

The outbreak was first noticed in May this year [2006], and has mostly affected the main island of Rarotonga. Dengue notifications in NZ have also increased significantly this year, with ESR documenting 17 notifications over the 12 months to June 2006 compared with only four in the 12 months to June 2005. All cases were overseas acquired.

Dengue fever and dengue haemorrhagic fever (DHF) are viral diseases transmitted by Aedes mosquitoes, usually Ae. aegypti. The four dengue viruses (DEN-1 to DEN-4) are immunologically related, but do not provide cross-protective immunity against each other.

Dengue, a rapidly expanding disease in most tropical and subtropical areas of the world, has become the most important arboviral disease of humans. More than 2.5 billion persons now live in areas at risk of infection, and attack rates for reported disease in epidemics are in the range of 1 per thousand to 1 per hundred of the population. Infection rates (that is, the proportion of the population that is infected, including persons who do not get severe symptoms or are not reported) can be five- to ten-fold greater.

As of 2004, dengue fever is endemic in most tropical countries of the South Pacific, Asia, the Caribbean, the Americas, and Africa. Additionally, most tropical urban centres in these regions have multiple dengue virus serotypes co-circulating (hyperendemicity), which increases both dengue transmission and the risk of DHF. High levels of dengue transmission are anticipated in all tropical areas of the world for the indefinite future. The incidence of the severe form of the disease (DHF) has already increased dramatically in Southeast Asia, the South Pacific and the American tropics in the past 25 years, with major epidemics occurring in many countries every 3-5 years.

The case-fatality ratio for DHF averages about 5% worldwide, but can be kept below 1% with proper clinical management. Epidemics caused by all four virus serotypes have become progressively more frequent and larger in the past 25 years.

Risk for travellers

The principal vector mosquito, Ae. aegypti, is most frequently found in or near human habitations and prefers to feed on humans during the daytime. It has two peak periods of biting activity: in the morning for several hours after daybreak and in the late afternoon for several hours before dark. The mosquito may feed at any time during the day, however, especially indoors, in shady areas, or when it is overcast.

Mosquito breeding sites include artificial water containers such as discarded tyres, uncovered barrels, buckets, flower vases or pots, cans, and cisterns.

The estimated risk of dengue fever is approximately one illness per thousand travellers. While this figure may overestimate the risk for tourists who stay a few days in air-conditioned hotels with well-kept grounds, nevertheless travellers to endemic and epidemic areas should take precautions to avoid mosquito bites.

Symptoms

Dengue fever is characterized by sudden onset of high fever lasting 2-7 days after an incubation period of 3-14 days (most commonly 4-7 days). Other symptoms include severe frontal headache, retro-orbital pains, joint and muscle pains, nausea, vomiting, bleeding during the febrile phase (usually minor nose bleeds) but sometimes major) and rash. The rash appears 3-5 days after onset of fever and can spread from the torso to the arms, legs, and face. The rash is frequently not visible in darker skinned individuals. The disease is usually self-limited, although convalescence can be prolonged. Dengue can also present as a severe, sometimes fatal disease characterized by haemorrhagic manifestations and hypotension (DHF/dengue shock syndrome). This is more common in those with a history of previous dengue infection.

GP’s should consider dengue in the differential diagnosis of any patient who has a fever and a history of travel to a tropical area within 2 weeks of onset of symptoms. Dengue is notifiable on suspicion to the Medical Officer of Health. Commercial tests are available for serologic diagnosis, but their results must be interpreted with care.

Prophylaxis

No vaccine is available. Travellers should be told that dengue is spread by daytime feeding mosquitoes and that their risk of acquiring dengue can be reduced by remaining in well-screened or air-conditioned areas when possible, wearing clothing that adequately covers the arms and legs, and applying insect repellent to both skin and clothing. The most effective repellents are those containing N,N-diethylmetatoluamide (DEET).

Treatment

Paracetamol is recommended for pain and fever. Acetylsalicylic acid (aspirin) and other nonsteroidal anti-inflammatory agents (such as ibuprofen) should be avoided because of their anticoagulant properties. Patients should be encouraged to rest and take abundant fluids. In severe cases (DHF) hospital admission is necessary.
There have been significant increases in notifications for certain food and water-borne infections (Campylobacter, hepatitis A and VTEC/STEC [Verotoxin producing E.coli/Shiga toxin producing E.coli infection]), while others (gastroenteritis, salmonella and shigella) show statistically significant falls. The high rates of Campylobacter infection mirror a nationwide trend although notification rates do appear to be falling somewhat now that the usual spring peak has passed.

As noted previously, the rise in hepatitis A infections mostly involves NZ born (and therefore non-immune) children of Pacific Island parents who travel to the islands for holidays with friends/family or who are infected by returning family members or friends visiting New Zealand.

The increase in VTEC/STEC infections only involves small numbers and appears to be due to an increase in sporadic cases.

Notifications of both meningococcal disease and pertussis remain at low levels, with the total number of meningococcal cases for the first ten months of 2006 standing at 37 cases. This is the lowest January - October total in Auckland for any year since 1992.