

Tuberculosis, diabetes mellitus, and Malaysia

Tuberculosis (TB) remained a leading cause of mortality in Malaysia and it had been reported that TB was among the top five transmissible diseases.^[1,2] In Malaysia, national TB control program was introduced in 1961 and it played vital role in controlling TB.^[2] However, a gradual increase in the number of TB notification was observed in the last decade. The incidence of TB in 1997 was 63.6/100,000 populations when compared to 61.0/100,000 population in 1996^[3] and it reached to 64.7/100,000 in year 2000.^[4] In Malaysia, the highest incidence of (TB) was in the states of Sabah, Wilayah Persekutuan, Sarawak and Pinang.^[4] Sabah accounted for 29% of the total newly identified cases at national level and annual notification rate were also highest than other states of Malaysia.^[5,6] The directly observed treatment, short-course (DOTS) therapy was first employed in Malaysia during 1999, and free medication were provided to the patients. However, overall cases of all forms of TB had been augmented from 15,057 in year 2000 to 22,710 cases in 2012.^[1,7,8]

Unfortunately, Malaysia is still unable to achieve the millennium development goal 6 for TB, which is to halt the incidence, prevalence and mortality rate associated with TB by the year 2015.^[9] Major risk factors for developing a TB infection include immunodeficiency diseases, e.g., HIV/AIDS and diabetes mellitus (DM), poverty, illiteracy, smoking, and silicosis. It is often believed that diabetic patients have compromised immunity, which renders them more susceptible to bacterial, viral, and fungal infections. Moreover, extrapulmonary TB further complicates the scenario and frequently found in HIV/AIDS patients.^[8,10] The reported cases of TB and HIV coinfection were increased dramatically from 6 cases in the year 1990 to 933 cases in the year 2002.^[2] However, it has been

speculated that diabetes is the leading risk factor for TB in Malaysia and co-occurrence of DM and TB increases the complications. Inclining trends of TB as well as DM in Malaysia, foretell an alarming condition. Sulaiman *et al.* in their study have reported that people suffering from DM were approximately 3 times more prone to developing TB when compared to those without DM.^[10] Furthermore, it was found that patients suffering from both DM and TB had poor treatment outcomes and high treatment cost compared to those with only TB.

Early detection of TB and screening program among immigrant is an important strategy to eliminate TB from society. Furthermore, public awareness, government policies, active DOTS program, research motivation from clinic to society is elements for tackling TB.

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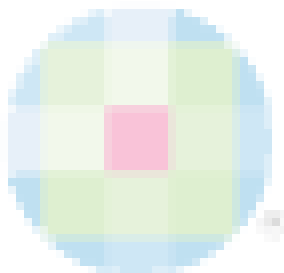
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