

EFFECTIVENESS OF COMPREHENSIVE VARIABLE NUMBER OF TANDEM REPEAT (VNTR) ANALYSIS IN AREAS WITH A LOW INCIDENCE OF TUBERCULOSIS

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Abstract [Purpose] To ascertain the effectiveness of variable number of tandem repeat (VNTR) analysis in areas with a low incidence of tuberculosis (TB), we examined the combination of comprehensive VNTR analyses and field epidemiological investigation results in Yamagata Prefecture, Japan, where estimated incidence of new TB cases per 100,000 population was 11.3 in 2011.

[Methods] We collected *Mycobacterium tuberculosis* isolates from 184 (69.2%) of 266 pulmonary TB patients across the whole of Yamagata Prefecture between 2009 and 2011. Next, 24 loci [JATA (12), QUB-11a, ETR A, QUB-18, QUB-3232, v3820, v4120, MIRU04, MIRU16, MIRU40, ETR C, Mtub30, Mtub39] in VNTR genotypes were determined. The relationships among TB patients derived from the respective clusters were surveyed using field epidemiological investigation results provided by the Public Health Center.

[Results] Seventeen clusters were formed by 49 (26.6%) of the 184 isolates. We found 3 hospital infection cases, 3 family infection cases, and 1 nursing home infection case forming 6 clusters. Among these cases, two relationships among patients were revealed after additional epidemiological investigation at the Public Health Center. The VNTR pattern of the largest

cluster, which was formed by 12 isolates, was identical with that of an incipient patient of a TB mass infection that occurred in 2007.

[Discussion] In areas with a low incidence of TB, a combination of comprehensive VNTR analysis and field epidemiological investigation is useful to find unknown transmission routes, identify for new risk groups, and trace mass infections.

Key words: Low tuberculosis incidence, *Mycobacterium tuberculosis*, VNTR analysis, Molecular epidemiology, Field epidemiology

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A CASE OF DRY-TYPE TUBERCULOUS PERITONITIS
DUE TO SMALL INTESTINAL TUBERCULOSIS ASSOCIATED WITH
SYSTEMIC INFLAMMATORY RESPONSE SYNDROME

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Abstract A 30-year-old man was admitted to another hospital because of abdominal fullness, pain, and fever. Laboratory examinations revealed marked inflammation, and abdominal computed tomography showed diffuse thickening of the small intestinal wall and peritoneum, and soft tissue infiltration of the mesentery, without ascites. A chest X-ray showed no abnormal findings. Despite antibiotic and antituberculous therapy, the patient's general condition deteriorated; he subsequently developed systemic inflammatory response syndrome (SIRS). We therefore started steroid pulse therapy, which resulted in rapid improvement of his condition and symptoms. On the basis of enteroscopy, stool culture, and peritoneal biopsy findings, the patient was diagnosed with tuberculous peritonitis

caused by small intestinal tuberculosis and was readministered antituberculous therapy.

Key words : Intestinal tuberculosis, Tuberculous peritonitis, Steroid pulse therapy, SIRS

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A CASE OF LUNG DISEASE AND SPONDYLITIS DUE TO *MYCOBACTERIUM INTRACELLULARE* IN A IMMUNOCOMPETENT PATIENT

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Abstract A 73-year-old immunocompetent woman was diagnosed with pulmonary nontuberculous mycobacterial (NTM) infection and followed up without treatment. She developed lumbago and consulted a physician. Spinal magnetic resonance imaging (MRI) indicated pyogenic spondylitis and she was admitted to the orthopedics department at our hospital 4 months after developing lumbago. Spinal MRI on admission revealed spondylitis in L5/S1 and thus antibiotic agents were administered. However, the antibiotics were ineffective and she underwent surgery. *Mycobacterium avium* complex (MAC) was identified from cultures of surgical specimens, and the histopathological findings revealed epithelioid cell granuloma with necrosis. Spondylitis due to MAC was diagnosed and the patient was administered with rifampicin, ethambutol, clarithromycin and streptomycin. She was discharged on hospital day 113 with a good outcome. Recently, the number of spon-

ditis due to NTM infection in immunocompetent patients have been increasing. We should take it into consideration that not only bacteria and *Mycobacterium tuberculosis* but also NTM infection can cause infectious spondylitis.

Key words: Nontuberculous mycobacteria, *Mycobacterium avium* complex, Spinal osteomyelitis

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PROGNOSIS OF PATIENTS WITH TUBERCULOSIS

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Abstract The global incidence of tuberculosis peaked around the year 2003 and is currently declining gradually. However, the worldwide incidence of new tuberculosis cases is still estimated to be 8.8 million/year, with 1.5 million deaths occurring per year. Considering that previous studies have determined the risk factors for death due to tuberculosis, we aimed at reviewing the literature to collectively evaluate these risk factors. According our literature review of 12 articles published in English language and 7 articles published in Japanese, the risk factors for death due to tuberculosis are age, human immunodeficiency virus (HIV) co-infection, multi-drug resistant tuberculosis (MDR-TB), malnutrition, low activities of daily living, co-morbidities, unemployment, and drug injection. We developed a scoring system to calculate the Tuberculosis Prognostic Score using 4 risk factors, namely, age, serum albumin level, oxygen requirement, and activities of daily living, after assessing several cohorts in Japan, in which HIV co-infection and MDR-TB are rare and their associations with mortality due to tuberculosis patients are unclear. This scoring

system was successfully able to estimate life prognosis of inpatients with newly diagnosed, smear-positive, lung tuberculosis without MDR-TB and/or HIV virus co-infection.

Key words : Senility, Malnutrition, Hypoalbuminemia, Respiratory failure, Activities of Daily Living

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TUBERCULOSIS ANNUAL REPORT 2011

— (1) Summary of Tuberculosis Notification Statistics and Tuberculosis in Foreign Nationals —

Tuberculosis Surveillance Center (TSC), RIT, JATA

Abstract The Tuberculosis Surveillance Center (TSC) at the Research Institute of Tuberculosis has published a series of annual reports on tuberculosis (TB) statistics in Japan since 2008. These reports are based on information on the nationwide computerized TB surveillance system database, which has been in operation since 1987. This is the first of a new series of reports for the “TB Annual Report 2011” that includes a summary of TB statistics and an overview of TB cases with foreign nationality in 2011.

A total of 22,681 cases with all types of TB were notified in 2011 with a notification rate of 17.7 per 100,000 population. The TB notification rates decreased to less than 20 per 100,000 population in 2007 and continued to decline until 2011. A total of 8,654 sputum-smear positive pulmonary TB were notified in 2011, at a rate of 6.8 per 100,000 population. The number of latent TB infection (LTBI) cases requiring prophylactic treatment drastically increased from 4,930 cases in 2010 to 10,046 cases in 2011.

Surveillance data on TB cases with foreign nationality in Japan have been collected since 1998. The number of TB cases with foreign nationality increased from 739 in 1998 to 931 in 2004 but has been stagnated since then, that indicated 921 in 2011. The TB cases with foreign nationality accounted for 2.1 % of all new TB cases in 1998, and this percentage increased to 4.1 % in 2011. Of note, new TB cases with foreign nation-

ality aged 20–29 years accounted for 30.0% of all new TB cases among the same age group in 2011. Among the TB cases with foreign nationality, more than half were from China (29.6%) and the Philippines (23.7%) taken together. In most cases, foreign nationals developed TB within 5 years of entry into Japan, including 80.0% of those aged 10–19 years and 80.8% of those aged 20–29 years. Of these TB cases with foreign nationality, 27% were noted in full-time employees, followed by unemployed persons (21%) and students (20%).

With an increase in the number of immigrants into Japan, the proportion of TB cases with foreign nationality is expected to increase, particularly among young adults and those from countries with a high burden of TB.

Key words: Tuberculosis, Notification rate, Latent tuberculosis infection, Foreign nationals, Year of entry, Occupation

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