

Original Article

RECENT CASE-FINDING ACTIVITIES OF SCHOOL CHILDREN IN JAPAN

Hitoshi HOSHINO, Seiya KATO, and Nobukatsu ISHIKAWA

Abstract [Purpose] The procedure for TB mass-screening of elementary and junior-high school students was revised in 2003 in Japan. An interview sheet with questions about the past history of TB, episodes of contact with TB patient, TB symptoms, and BCG vaccination history has been administered to all students to determine high-risk groups for TB infection or TB disease despite previous mass-screening with PPD testing for those in first grade. Our purpose in the present study was to evaluate the effects of revised case-finding activity for these school students.

[Method] We analyzed the case-finding activities for school students from 2003–2008 based on data from the national TB surveillance system and related ad-hoc surveys.

[Result] The total number of notified TB cases among these students was 295 out of which 156 were detected by contact survey, 110 by consultation at medical facilities with symptoms, 19 by mass-screening at schools, and the remaining 10 by other means. Although the contact investigation detected more than half of all cases, there were some more cases with a known source of infection among those who were detected in other modes; 28 cases were identified by consultation at medical facilities and 10 by school mass-screening. Case-finding activities by consultation at medical facilities detected 43 bacteriologically positive cases. There were 97 cases without a known source of infection. Most of the cases detected by school mass-examination had risk factors such as TB history in the family and/or a history of staying in TB-prevalent countries.

The TB incidence in urban areas is higher than that in other areas for junior-high school students with known or unknown sources of infection.

[Discussion] The effectiveness of the contact investigation could be enhanced by improving its way of implementation. Delay of diagnosis for infectious cases should be minimized as much as possible to prevent TB outbreaks among students. For that purpose, parents, school teachers, and school nurses should be aware to prevent a delay in seeking care for the patient. Because the efficiency of the current school mass-screening is quite low, revision of this program is necessary, taking into consideration the reinforcement of other case-finding activities. The difference between urban and other areas might be due to a higher infection risk in junior-high school students in urban areas who have higher social activity and may be exposed to higher TB infection risk due to casual contact.

Key words: Tuberculosis, School mass-examination, Case-finding

Research Institute of Tuberculosis, Japan Anti-Tuberculosis Association (JATA)

Correspondence to: Hitoshi Hoshino, Research Institute of Tuberculosis, JATA, 3-1-24, Matsuyama, Kiyose-shi, Tokyo 204-8533 Japan. (E-mail: hhoshino@jata.or.jp)

Review Article

MOLECULAR EPIDEMIOLOGY OF *MYCOBACTERIUM TUBERCULOSIS*
AND ITS PROSPECT BASED ON VARIABLE NUMBER OF
TANDEM REPEAT (VNTR) GENOTYPING

— A Strategy in Osaka City, Japan —

Takayuki WADA and Atsushi HASE

Abstract The methodological establishment of variable number of tandem repeat(s) (VNTR) genotyping of *Mycobacterium tuberculosis* has opened a new era of molecular epidemiology against tuberculosis (TB). The method can provide simple, rapid and accurate identification of clinical isolates from TB patients that makes it possible to compare the isolates among different laboratories. Such advantages of VNTR not only help us certify the identification of isolates in putative outbreaks easily but also promote the reasonable estimation of unidentified transmissions in surveillance studies. Recently, the Japan Anti-Tuberculosis Association (JATA) (12)-VNTR has become a standard genotyping method of *M. tuberculosis*, and its spread has been expected in Japan. In Osaka City, located in the western part of the country, JATA (12)-VNTR has been applied to molecular epidemiological study of TB. Moreover, the additional 12 VNTR loci have been analyzed for various purposes, such as to enhance the discriminatory power (public health needs) or to further analyze the population genetic structure (research needs). As the nationwide

findings of VNTR genotyping of *M. tuberculosis* are accumulated, this technology will be increasingly useful for detecting transmission of any specific strain in large geographic areas that could not be recognized by conventional epidemiological methods. The needs for the VNTR genotyping of *M. tuberculosis* and its practical uses are expected to expand drastically in the future.

Key words: *Mycobacterium tuberculosis*, VNTR, Molecular epidemiology, Public health

Department of Microbiology, Osaka City Institute of Public Health and Environmental Sciences

Correspondence to: Takayuki Wada, Department of Microbiology, Osaka City Institute of Public Health and Environmental Sciences, 8-34, Tojo-cho, Tennoji-ku Osaka-shi, Osaka 543-0026 Japan.
(E-mail: taka-wada@city.osaka.lg.jp)

The 85th Annual Meeting Educational Lecture

FUTURE TUBERCULOSIS CARE IN JAPAN

Eriko SHIGETO

Abstract In Japan, the care of patients with tuberculosis has been mainly dependent on the state of hospital wards. The number of patients that have tuberculosis has steadily declined over the years, and we are now on the way to low prevalence state of tuberculosis. However there is a need for discussion about how future care for patients with tuberculosis should take place. The problems of present tuberculosis care system are as follows: i) there is inefficiency and difficulty in maintaining the tuberculosis wards because of the declining number of patients and specialists; ii) there are difficulties in treating complications such as renal insufficiency which requires blood dialysis, delivery, psychiatric diseases in tuberculosis beds; iii) there is a high proportion of elderly patients that require substantial nursing care and long-term admission in the hospital; iv) there is not only insufficient patient care but also financial support for patients with socioeconomic problems such as foreign-born worker or homelessness, v) in addition to the medical care for patients of MDR-TB being insufficient, there are also inappropriate environment and amenities for long-term hospitalization. Moreover the public subsidy system for medical treatment requires patients to pay 5% of expense cost in the outpatient clinic.

The following points should be discussed for the future tuberculosis care system: i) general hospitals should take more

part in caring for patients with complications and there should be a close cooperation among general hospitals, tuberculosis specialists and the administration; ii) there should be a limited number of hospitals maintained for the integrated treatment of MDR-TB including surgical treatment and suitable circumstances for long-term hospital care. Additionally, there should be a system of detention for non-adherent patients or home isolation for adherent patient; iii) there should be reinforcement of public commitment for patients with socioeconomic problems or MDR patients such as public subsidized full coverage of medical expense, free treatment in regional health centers etc.

Key words: Tuberculosis beds, Regional medical liason, Assignment, Patient oriented care, Public commitment

National Hospital Organization Higashihiroshima Medical Center

Correspondence to : Eriko Shigeto, National Hospital Organization Higashihiroshima Medical Center, 513 Jike, Saijicho, Higashihiroshima-shi, Hiroshima 739-0041 Japan.
(E-mail: eshigetou@hiro-hosp.jp)

————— The 85th Annual Meeting Symposium —————

THE ISSUE OF TUBERCULOSIS IN THE ELDERLY IN JAPAN

Chairpersons: ¹Makoto TOYOTA and ²Yuka SASAKI

Abstract Tuberculosis in the elderly remains a health burden in Japan. Most of the elderly aged more than 70 years in Japan had become infected with *Mycobacterium tuberculosis* in their youth, and the elderly represent a population at a special high risk for developing tuberculosis owing to comorbidity and age-related immunosuppression. The characteristics of tuberculosis in the elderly are different from young patients. To reduce active tuberculosis in the elderly, treatment of latent tuberculosis infection for compromised host could be strengthened, however its impact might be limited. Elderly tuberculosis patients have not only clinical problems but also socioeconomic problems. Major problems of elderly tuberculosis patients are concurrent diseases, bedridden states, necessity of nursing care, undernourished, poor adherence, and poor performance status of patients. With this symposium, we focused on the issue of tuberculosis in the elderly in Japan. The speakers were invited from various areas, including tuberculosis surveillance center, public health center and national hospital organization medical center.

1. Current trend of elderly TB: Masako OHMORI (Tuberculosis Surveillance Center, Research Institute of Tuberculosis, JATA)

Although the tuberculosis (TB) incidence rate in Japan reached 19.4 per 100,000 in 2008, the rates among the elderly (65+ yrs) were high, e.g. 29.5 of those aged 64–74 years, 64.2 of those aged 75–84 years and 97.3 of those aged 85 years and over. The proportion of those aged 65 years and over increased from 36.8% in 1987 to 56.7% in 2008. Regarding the delay of case detection among elderly TB patients, the patient's delay tended to be shorter but the doctor's delay was longer. Although most TB patients including elderly TB patients were detected upon visiting a medical institution with some symptoms, in the case of elderly TB more patients were detected as outpatients or inpatients for a disease other than TB. Among TB patients aged 65 years and over, 26.4% died within one year.

2. The issues of elderly tuberculosis—An outbreak of pulmonary tuberculosis at nursing home for the elderly: Michiaki OKUMURA (Public Health Division, Public Health and Welfare Bureau, City of Osaka)

I experienced a mass outbreak of pulmonary tuberculosis with 8 patients (including the source of infection) and 6 latent tuberculosis infections. Five patients (including the source) of the 8, I underwent restriction fragment length polymorphism (RFLP) analysis of isolated from the sputum. Five patients showed an identical RFLP pattern. These results showed that the infection had arisen from one source. The disease of 4 patients (aged 74–103) seemed to be caused by exogenous

reinfections. The elderly tend to have some complications and to be malnutrition. These factors may be risk factors of tuberculosis reinfection for elderly.

3. The community DOTS in the elderly: Yoko HASHIMOTO (Wakayama Prefecture Gobo Health Center)

In Wakayama prefecture, we have established a standard assessment list of adherence for tuberculosis patients. To identify predictors of default in the elderly, we investigated assessment lists of tuberculosis patients registered in Gobo Health Center from 2004 to 2007. Factors associated with default were concurrent diseases, side effects, disability and no family support. We have developed a liaison critical pathway for tuberculosis in Gobo Health Center and Tanabe Health Center since 2007. Introducing the path, we could strengthen community medical cooperation and build a network to support adherence. Health center staff should expand the community DOTS in the elderly with establishing an effective community collaboration.

4. The clinical issue of tuberculosis in the elderly: Takeshi KAWASAKI (Department of Respiriology, Graduate School of Medicine, Chiba University, Department of Thoracic Disease, National Hospital Organization Chiba-East National Hospital)

To identify the clinical issue of TB in the elderly, 139 cases were studied. There were 63 elderly cases in the 139. In the elderly TB patients, there were many cases of death and moving out, so the clinical results were poor. Some cases take much time to move out. It is important to inform doctors and people who care for the elderly that the elderly are under high risk of tuberculosis, to consider treatment for latent tuberculosis infection of high risk groups of tuberculosis, and that experts in tuberculosis, local doctors, health care center and geriatric facilities have close relation.

5. Problems and measures of tuberculosis in elderly group: Masahiro ABE (National Hospital Organization Ehime National Hospital)

The percentage of the aged is high among all of tuberculosis patients, especially in the country compared to the city. I reported problems concerning tuberculosis treatment and ward management for elderly patients. During the hospitalization, the management of underlying diseases and new complications besides tuberculosis treatment is critical. Dysphagia features particularly make difficult to take anti-TB drugs and nutritional state worse. The rehabilitation of swallowing functions is effective to improve these conditions. To make discharge support more helpful, the support system, including regional

cooperation path is expected to advance more widely and deeply.

Key words: Tuberculosis, Elderly, Current trend, Outbreak, DOTS, Clinical characteristic

¹Kochi City Public Health Center, ²National Hospital Organiza-

tion Chiba-East National Hospital

Correspondence to: Makoto Toyota, Kochi City Public Health Center, 1-7-45, Marunouchi, Kochi-shi, Kochi 780-0850 Japan. (E-mail: kc-140200@city.kochi.lg.jp)

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