

## Original Article

CLINICAL ANALYSIS OF 115 PULMONARY TUBERCULOSIS PATIENTS  
WITH SPUTUM SMEAR-NEGATIVE

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and <sup>1,2</sup>Kazuma KISHI

**Abstract** [Methods] We retrospectively studied 115 consecutive pulmonary tuberculosis patients whose sputum smear was negative, diagnosed by positive culture and/or PCR of various samples, or positive QFT.

[Results] The culture positive rate of tuberculosis by sputum, gastric aspirate, bronchoscopy, and computed tomography (CT)-guided needle biopsy samples was 55.7%, 45.6%, 73.2%, and 71.4%, respectively. In multivariate analysis, negative or unknown sputum PCR, negative or unknown gastric aspirate, and minimal spread of tuberculosis were risk factors for negative culture from both sputum and gastric aspirate. Sputum culture was positive in only one of the four patients with multi-drug resistant *Mycobacterium tuberculosis*.

[Conclusion] Invasive diagnostic procedures such as fiber-

optic bronchoscopy should be considered in patients with negative sputum PCR and minimal spread of tuberculosis.

**Key words:** *Mycobacterium tuberculosis*, Fiberoptic bronchoscopy, Sputum smear-negative, Multi-drug resistant tuberculosis

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## Original Article

ESTIMATION OF POSITIVE RATES OF INTERFERON-GAMMA  
RELEASE ASSAY BY AGE GROUP IN JAPAN

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and <sup>4</sup>Takashi YOSHIYAMA

**Abstract** [Background] Interferon-gamma release assay (IGRA) is necessary for evaluating *Mycobacterium tuberculosis* infection in Japan. Application of IGRA for contact surveys has been extended for the aged population; however, there is little information on positive rates with QuantiFERON® in Tube (QFT-3G) and T-SPOT.®*TB* (T-SPOT), which sometimes makes it difficult to interpret the results of IGRA performed in contact investigation including the aged population.

[Objective] To estimate the positive rate of IGRAs by age group in the general population as well as among healthcare workers.

[Methods] We requested all public health centers in Japan to provide contact investigation data for which the risk of infection is limited. Collected data included results of IGRAs in the target group, sputum bacteriological examinations and chest-image findings, and symptoms of the index cases as well as closeness and duration of contact between the index case and the target group. We scrutinized all the cases and exclude data that were not eligible for this study.

Positive rates by age group were calculated by summing the number of contacts who were “positive” and dividing by the number of examinees.

[Results] In spite of our effort to exclude newly infected persons from the index case, a small portion (probably 3%) may be due to those newly infected by a source case, as it is difficult to exclude those who get infected by casual contact. It is sometimes difficult to collect information on the closeness and overall duration of contact with the index case, which is a limitation in the questionnaire.

Positive rates of IGRA by age group in the general popula-

tion were one third to one fifth of the predicted prevalence of infection, which is consistent with findings in the study using QFT Gold (QFT-2G) that IGRA wanes after infection.

There were no differences of IGRA positive rate between the general population and health care workers. It may be because the risk of infection for health care workers is similar, as the number of infectious TB patients has been decreasing and infection control in hospitals has generally improved. It may be also because targets for IGRA in contact examination among health care workers tend to be broad including a certain number of low risk staff.

[Conclusion] With reference to past studies, we estimated that IGRA positive rates were 5% in the 60's and 15% in the 70's. It will be useful in assessing the possibility or spread of infection for aged groups in contact investigation.

**Key words:** Interferon-gamma release assay, Positive rate, Predicted prevalence of infection, General population, Healthcare worker

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## Original Article

COMPARISON OF TUBERCULOSIS SURVEILLANCE SYSTEMS  
IN JAPAN AND LOW-INCIDENCE COUNTRIES: INSTITUTIONAL DESIGN<sup>1,2</sup>Kiyohiko IZUMI, <sup>1</sup>Kazuhiro UCHIMURA, and <sup>1,2</sup>Akihiro OHKADO

**Abstract** [Objective] To compare the tuberculosis (TB) surveillance systems of Japan and low TB-incidence western countries in terms of institutional design.

[Method] We conducted a descriptive comparative study for TB surveillance systems in Japan, the Netherlands, the United Kingdom, and the United States. The following information was collected from self-administrated questionnaires and relevant published data: 1) TB notification, 2) TB registration, 3) quality assurance and data protection mechanisms, 4) linkage with other surveillance, and 5) data disclosure.

[Result] The basic structure common to all countries surveyed was that TB notifications were reported quickly through an online system, as required by law. TB registration data, which included detailed demographic and clinical information, was shared via the database and available to all administrative levels. In addition, aggregated data reports were published periodically. Information related to TB genotype and data quality assurance, for example, detection of dupli-

cation of records, was available in surveillance systems in countries other than Japan.

[Conclusion] We propose that developing a sharing mechanism for TB genotype and ensuring better quality assurance would strengthen the Japanese TB surveillance system.

**Key words:** Tuberculosis, Surveillance, Institutional design, Quality assurance

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—————Original Article—————

## COMPARISON OF TUBERCULOSIS SURVEILLANCE SYSTEMS IN JAPAN AND LOW-INCIDENCE COUNTRIES : REPORTING DATA ITEMS

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**Abstract** [Objective] To compare the tuberculosis (TB) surveillance systems of Japan and low TB-incidence western countries in terms of reported data items.

[Method] We conducted a descriptive comparative study for TB surveillance systems in Japan, the Netherlands, the United Kingdom, and the United States. Data items reported by the surveillance systems were collected and summarized by the categories prepared by the authors. Additionally, relevant published data were collected.

[Result] The data items collected in each country surveyed was around 40 categories, among which 21 categories were common to the all surveyed countries. Regarding data items collected from the surveyed countries other than Japan, information related to risk factors such as drug addiction, imprisonment history, and history of residence in nursing home; TB genotype; and contact investigation were available in the surveillance system. In Japan, treatment outcomes are automatically determined by a preset algorithm, which leads to high percentage of outcomes not being evaluated.

[Conclusion] Potential suggestions for the Japanese TB surveillance system are reconsidering risk factor items, collecting and evaluating contact investigation information through the surveillance system, adding genotype information, and introducing manual assessment of treatment outcome.

**Key words:** Tuberculosis, Surveillance, Data items, Risk factor

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**Case Report**

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**A CASE OF PULMONARY FLARE-UP TUBERCULOSIS  
WITH AN ESOPHAGO-BRONCHIAL FISTULAS  
AFTER CHEMORADIO THERAPY FOR ESOPHAGEAL CANCER**

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<sup>2</sup>Yasuko SUEYASU, and <sup>3</sup>Yasuhiro FUNATSU

**Abstract** We present a case of a 59-year-old man with pulmonary tuberculosis and esophago-bronchial fistulas after chemoradiotherapy (CRT) for esophageal cancer. A lung nodule was detected in the right upper lobe and diagnosed as an inactive old inflammatory tumor by several examinations, including bronchoscopy. He was admitted to our hospital because of dysphagia 3 months later. The esophagoscopy showed advanced, stage IVa esophageal cancer. He received CRT at the university hospital and experienced partial remission. Two months later, he called an ambulance for dyspnea and chest roentgenography showed pneumonia in the right lung fields. The respiratory failure was severe and required mechanical ventilation. The intubation and bronchoscopy were performed in the emergency room. The bronchoscopy showed the esophago-bronchial fistulas due to recurrent esophageal cancer and backward flow of digestive juice. *Mycobacterium tuberculosis* was isolated from aspirated sputum several days later. Administrations of isoniazid/

levofloxacin and intramuscular injection of streptomycin were started. The patient moved to a medical center with a tuberculosis ward while on the respirator. The tuberculosis was not detected in the ward for 2 months. The patient returned to our hospital, but his esophageal cancer had progressed with distant metastases, he died 3 weeks later. When performing CRT, we should be careful for relapse of tuberculosis.

**Key words:** *Mycobacterium tuberculosis*, Esophageal cancer, Esophago-bronchial fistulas, Pneumonia, Chemoradiotherapy

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