

## CLINICAL FEATURES OF PULMONARY *MYCOBACTERIUM AVIUM* COMPLEX DISEASE DIAGNOSED THROUGH GASTRIC ASPIRATE CULTURE

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**Abstract** [Objectives] The diagnostic significance of gastric aspirate culture has been established in pulmonary tuberculosis, but not in pulmonary *Mycobacterium avium* complex (MAC) disease. This study aimed to verify the diagnostic significance of gastric aspirate culture in pulmonary MAC disease.

[Subjects and Methods] This retrospective study analyzed 77 cases of pulmonary MAC disease tentatively diagnosed through gastric aspirate culture in comparison with 308 cases diagnosed through sputum culture.

[Results] There was no significant difference in the clinical symptoms, laboratory data, or type of disease in both groups. Patients diagnosed through gastric aspirate culture had a significantly lower chance of having underlying respiratory disease (26.0% vs. 46.8%), which indicates the difficulty in obtaining sputum specimens from this group of patients. In 114 patients without chemotherapy intervention, more patients achieved spontaneous remission in the gastric aspirate group than in the sputum group. Among 271 patients treated with chemotherapy, there were no significant differences in the course of radiological findings and clinical symptoms between

both groups. During the observation period, a definitive diagnosis through sputum culture or histological confirmation was reached in 34 of 47 patients (72%). There was no significant difference in the clinical characteristics, course of radiological findings, and clinical symptoms in the definitive group and tentative group.

[Conclusion] Gastric aspirate is a minimally invasive, easy to conduct, and useful test for diagnosing pulmonary MAC disease.

**Key words:** Nontuberculous mycobacteriosis, Gastric aspirate, Diagnosis, *Mycobacterium avium* complex

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## ANALYSIS ON WORKLOAD FOR HOSPITAL DOTS SERVICE

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**Abstract** [Background and Objective] A directly observed treatment short course (DOTS) trial was launched in Japan in the late 1990s and targeted patients with social depression at urban areas. Based on these findings, the Ministry of Health, Labour and Welfare established the Japanese DOTS Strategy in 2003, which is a comprehensive support service ensuring the adherence of tuberculosis patients to drug administration. DOTS services are initially provided at the hospital to patients with infectious tuberculosis who are hospitalized according to the Infectious Diseases Control Law. After being discharged from the hospital, the patients are referred to a public health center. However, a survey conducted in 2008 indicated that all the patients do not receive appropriate DOTS services at some hospitals. In the present study, we aimed to evaluate the protocols and workload of DOTS at hospitals that are actively involved in tuberculosis medical practice, including DOTS, to assess whether the hospital DOTS services were adequate.

[Method] We reviewed a series of articles on hospital DOTS from a Japanese journal on nursing for tuberculosis patients and identified 25 activities regarding the hospital DOTS service. These 25 items were then classified into 3 categories: health education to patients, support for adherence, and coordination with the health center. In total, 20 hospitals that had >20 authorized tuberculosis beds were selected—while considering the geographical balance, schedule of this survey, etc.—from 33 hospitals where an ex-trainee of the tuberculosis control expert training program in the Research Institute of Tuberculosis (RIT) was working and 20 hospitals that had collaborated with our previous survey on tuberculosis medical facilities. All the staff associated with the DOTS service were asked to record the total working time as well as the time spent for each activity. The data were collected and analyzed at the RIT.

[Result] The working times for each activity of the DOTS service for nurses, pharmacists, ward clerks, head nurses, and doctors were 100, 90, 87, 86, and 63 min, respectively. For other professions, including medical social workers, nursing aids, nutritionists, and physical therapists, the working times

for each activity of the DOTS service were 31, 18, 10, and 8 min, respectively.

The professionals who spent a longer time on health education, support for patient adherence, and coordination with the health center were pharmacists, doctors, and head nurses; nurses, pharmacists, and doctors; and head nurses, doctors, and ward clerks, respectively.

[Discussion] Aging of tuberculosis patients was associated with problems on adherence in many patients, including patients who were not suited for a standard regimen, patients whose activity of daily life had deteriorated due to senile dementia, patients with diabetes mellitus, etc. Smoking cessation and mental care for cases of multi-drug resistant disease are new challenges in tuberculosis patient care. The present study clearly indicated that activities including patient education, support for patient adherence, and coordination with the health center—essential components of the hospital DOTS service according to the Japanese DOTS Strategy—were performed by a team of professionals including doctors, nurses, pharmacists, medical social workers, etc., depending on the features and roles that they serve and the needs of each patient. For good practice of hospital DOTS, it is essential to not only provide DOTS, but also effectively provide individual or group health education and coordinate with health centers, thus aiming towards a better community DOTS service after patient discharge.

**Key words:** Hospital DOTS, Workload, Education to patients, Support for adherence, Coordination

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## Original Article

EFFECTIVENESS OF INTERFERON-GAMMA RELEASE ASSAYS  
IN THE TUBERCULOSIS CONTACT INVESTIGATION  
OF ELDERLY PEOPLE

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**Abstract** [Purpose] To confirm the effectiveness of interferon-gamma release assays (IGRAs) in the tuberculosis (TB) contact investigation of elderly people, we analyzed the results of the QuantiFERON® TB Gold in tube (QFT-3G) test, which is a commercially available IGRA.

[Methods] We analyzed the results of the QFT-3G test in 2,420 subjects who were in close contact with TB patients. We investigated subjects with latent TB infection and those showing the onset of TB among the QFT-3G-positive subjects.

[Results] The QFT-3G-positive rate was 7.3% (95% confidence interval, 6.2%–8.3%). In addition, we demonstrated that the QFT-3G-positive rate increased with age ( $P < 0.001$ ).

[Discussion] The QFT-3G-positive rate was high, particularly in elderly people ( $\geq 60$  years), but the rate was significantly lower than the predicted prevalence of TB infection. Therefore, it was assumed that the QFT-3G test does not always provide a positive result, even in cases of subjects with a previous TB infection. Furthermore, data from the QFT-3G-positive subjects indicated that approximately one half of

subjects aged 60–69 years, approximately one-third of those aged 70–79 years, and approximately one-quarter of those aged over 80 years have had recent TB infections. In conclusion, the results of the QFT-3G test in elderly people need to be carefully evaluated according to the contact situation with TB patients; nevertheless, the QFT-3G test is useful for the screening of latent TB infection in elderly people who were in close contact with TB patients.

**Key words:** QFT-3G, Elderly, Contact investigation, Previous TB infection, Recent TB infection

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**Case Report**

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**FATAL NONTUBERCULOUS MYCOBACTERIAL LUNG DISEASE  
CAUSED BY *MYCOBACTERIUM KYORINENSE* :  
A CASE REPORT WITH FIVE YEARS OF FOLLOW-UP**

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**Abstract** An 85-year-old man with dementia first visited our hospital 5 years ago, complaining of hemoptysis. He was hospitalized 2 years later owing to fever, cough, and dyspnea. A chest computed tomography scan showed infiltration with a cavity in the left upper lobe. He was diagnosed with nontuberculous mycobacterial lung infection on the basis of the presence of acid-fast bacilli in the sputum and repeated bronchoalveolar lavage specimens; however, we were unable to identify the isolate by DNA–DNA hybridization. Although his general condition had slightly improved after treatment initiation, intermittent chemotherapy owing to the adverse effects of the drugs and dementia led to rapid disease progression and death. After his death, the isolated mycobacterium was identified as *Mycobacterium kyorinense* by

sequence analysis of the *hsp65* and *rpoB* genes.

**Key words** : *Mycobacterium kyorinense*, Nontuberculous mycobacterial disease, Fatal disease, Elderly, Compliance

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## TUBERCULOSIS CONTACT INVESTIGATION IN HOSPITALS

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**Abstract** [Objective] To contribute to measures against hospital-acquired infections by analyzing and evaluating tuberculosis contact investigations in hospitals.

[Methods] This study included 202 tuberculosis cases between January 2010 and September 2011 in which contact investigations were requested from the Public Health Office in Osaka City.

[Results] 1) To assess the necessity for contact investigation and the demographics of index cases, contact investigations were conducted for 66 of the 202 cases. Index cases with higher rates of contact investigation included those with “higher degree of sputum smear positivity,” “respiratory symptoms,” “period from hospitalization to tuberculosis diagnosis of 8 days or longer,” and “high-risk procedures (including endotracheal intubation, endotracheal aspiration, and bronchofiberscopy).” 2) A total of 632 contact persons from the following professions underwent QuantiFERON®-TB (QFT) testing: 59 doctors, 492 nurses, 60 other hospital staff members, and 21 patients, and the positive QFT rates were 18.6, 10.8, 13.3, and 14.3%, respectively. 3) Among the 66 index cases for which contact investigations were conducted, there were 0 QFT-positive contact persons in 37 cases (56.1%), 1 or more in 29 (43.9%), and 2 or more in 18 cases (27.3%). Assuming the dependent variable to be 0 and 1, respectively, for index cases with 0 and 2 or more QFT-positive contact persons,

we performed a multiple logistic regression analysis with independent variables that included the presence or absence of high-risk procedures, period from hospitalization to diagnosis either within 7 days or 8 or more days, presence or absence of cough and cavity, and the degree of sputum smear positivity (1+/2+/3+). Among these variables, those significantly associated with cases with 1 and 2 or more QFT-positive persons included the “presence of high-risk procedures” and “period from hospitalization to diagnosis of 8 days or longer” ( $P < 0.05$ ).

[Discussion] Our results suggest that early diagnosis and appropriate responses during high-risk procedures may be necessary measures to prevent hospital-acquired infections.

**Key words:** Tuberculosis, Nosocomial infection, Contact investigation, Doctor’s delay, Tracheal aspiration, QFT

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