



Kekkaku

# 結核

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Vol. 95 No.1 January-February 2020

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日本結核 非結核性抗酸菌症学会誌

## インターフェロン $\gamma$ 遊離試験を用いた解剖時の結核感染リスクの検討

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**要旨：**〔目的〕解剖時の結核感染リスクを、インターフェロン $\gamma$ 遊離試験（IGRA）を用いた接触者健診で分析評価した。〔方法〕2015～2018年に大阪市で実施した接触者健診のうち結核患者の解剖を伴う事例を抽出した。接触者を「解剖従事者」（N95マスクを着用せず解剖）、「その他の解剖関係者」（N95マスクを着用し解剖、解剖終了直後の入室、病理標本を作成）、「非解剖関係者」（病棟の接触者、現場検証を行った警察官）の3群に分けIGRA陽性率を比較した。〔結果〕対象は6事例で、IGRAを実施した接触者は142（各事例につき3～84）名であった。陽性率は「解剖従事者」63.0%（17/27）、「その他の解剖関係者」4.0%（1/25）、「非解剖関係者」4.4%（4/90）で、「解剖従事者」は他の2群より有意に陽性率が高かった（ $p < 0.001$ ）。「解剖従事者」のうち職種ごとの陽性率は、執刀医80.0%、助手66.7%、検査技師50.0%、その他（主治医、記録係、警察官等）58.3%で、職種間で陽性率に有意差はなかった。〔結語〕N95マスクを着用せず解剖に従事した者は職種に関係なく結核感染リスクが高かった。

**キーワード：**結核，感染，解剖，IGRA，接触者健診，N95マスク

## Original Article

RISK OF TUBERCULOSIS INFECTION AT AUTOPSY EVALUATED  
BY INTERFERON- $\gamma$  RELEASE ASSAY

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<sup>1</sup>Hideki YOSHIDA, and <sup>2</sup>Akira SHIMOUCI

**Abstract** [Purpose] To evaluate risk of tuberculosis infection at autopsy through contact investigation by Interferon- $\gamma$  Release Assay (IGRA).

[Methods] Records of contact investigation conducted by Osaka City Public Health Office from 2015 to 2018 were retrospectively reviewed. We studied all cases that included autopsy workers among contacts. Contacts were divided into 3 categories, (1) “autopsy worker” who stayed in autopsy room at autopsy without N95 respirator, (2) “other autopsy attendant” who stayed in autopsy room at autopsy with N95 respirator, stayed after autopsy, or prepared pathological specimen, (3) “contact outside an autopsy room” (hospital staff, patient in same room, police officer doing field check who did not enter an autopsy room). Then we compared positive rates of IGRA among these three categories.

[Results] There were six cases of contact investigation which included autopsy worker. Among them only in one case, index case was diagnosed as tuberculosis before autopsy. IGRA was tested for 142 contacts (the number of contacts per case ranges from 3 to 84). IGRA positive rates were (1) “autopsy worker”: 63.0% (17/27), (2) “other autopsy attendant”: 4.0% (1/25), and (3) “contact outside an autopsy room”: 4.4% (4/90). IGRA positive rate was significantly

higher in “autopsy worker” than the other 2 categories. Furthermore, among “autopsy worker”, IGRA positive rate was different among professional groups: i.e., pathologist: 80.0% (4/5), assistant: 66.7% (4/6), laboratory technologist: 50.0% (2/4), others (attending physician, recorder, police officer, etc): 58.3% (7/12). There was no statistically significant difference among these professional groups.

[Conclusion] Regardless of professional group, the IGRA positive rate of contacts staying in autopsy room at autopsy without N95 respirator was high. Therefore, it is essential to practice appropriate infection prevention of tuberculosis at autopsy.

**Key words** : Tuberculosis, Infection, Autopsy, IGRA, Contact investigation, N95 respirator

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## 結核接触者健診における QuantiFERON®TB ゴールドプラス導入に向けた検討

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**要旨：**〔目的〕結核接触者健診で行うQFT検査において、従来から使用していたクオンティフェロン®TBゴールド（QFT-3G）による検査方法とQuantiFERON®TBゴールドプラス（QFT-Plus）による新たな検査方法の比較検討を行い、検査方法の変更による影響を調べた。〔対象と方法〕71例（男性38名、女性33名：日本人27名、外国人44名：年齢23歳から73歳、平均値35.3歳、標準偏差10.4歳）について、ヘパリンリチウム採血管で採血後、QFT-Plus採血管4本とQFT-3G採血管のTB抗原採血管1本に分注し37℃、20±4時間培養後、各血漿をELISA法で測定し、結果を比較した。〔結果〕QFT-PlusおよびQFT-3Gの陽性率は共に5.6%（4/71）で、陽性陰性一致率は97.2%（69/71）であった。 $\kappa$ 係数は0.74となり、十分一致であった。インターフェロン $\gamma$ 値の相関係数は0.57であった。〔考察と結論〕接触者健診において、QFT-PlusはQFT-3Gと同程度の感度があり、試薬の切り替わりに影響がないことが分かった。

**キーワード：**接触者健診, QuantiFERON®TBゴールドプラス, クオンティフェロン®TBゴールド

## Short Report

STUDY ON VALIDITY OF QuantiFERON®TB GOLD PLUS  
IN TUBERCULOSIS CONTACT INVESTIGATION

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**Abstract** [Object] We evaluated the impact of test kit changes from QuantiFERON®TB Gold (QFT-3G) to new QuantiFERON®TB Gold Plus (QFT-Plus), in QuantiFERON test of tuberculosis contact investigation.

[Materials and Methods] Blood samples were collected from 71 tuberculosis contacts, 38 men and 33 women, composed of 27 Japanese and 44 foreigners, aged from 23 to 73, average was 35.3, standard deviation was 10.4. After collection of blood samples into lithium heparin tubes, each sample was dispensed to 4 tubes of QFT-Plus and 1 TB antigen tube of QFT-3G. These tubes were incubated at 37°C, 20±4 hours and the two kinds of test kit were performed according to the manufacturer's instructions. The results of the two tests kit were compared statistically with positive-negative conformity ratio (PNCr) and Cohen's  $\kappa$  statistic.

[Results] Positive rate of QFT-Plus and that of QFT-3G were both 5.6% (4/71) and PNCr was 97.2% (69/71).  $\kappa$  statistic was 0.74, and strength of agreement was "Substantial". The correlation coefficient between the concentra-

tion of IFN- $\gamma$  in QFT-3G and that in QFT-Plus was 0.57.

[Conclusion] Since the result of QFT-Plus is similar to that of QFT-3G, the impact of test kit changes on tuberculosis contact investigation should be negligible.

**Key words:** Tuberculosis contact investigation, QuantiFERON® TB Gold plus, QuantiFERON®TB Gold

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## 肺結核治療終了直前に出現し、初期悪化と考えられた 気管支ポリープの1例

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**要旨：**44歳男性。接触者健診で胸部異常陰影を指摘され当科を受診。胸部CTで左肺の粒状陰影と左肺門から縦隔にかけてリンパ節腫大を認めた。気管支洗浄液の培養で結核菌を証明し肺結核と診断した。しかし6カ月治療の終了直前から咳嗽の訴えあり、治療終了後に胸部CTを施行した結果、気管分岐部および左下葉入口部の気管支内腔にポリープ様陰影を認めた。気管支鏡を施行し、気道内に以前認めなかったポリープ様の隆起を確認し同部より生検を施行した。多核巨細胞を伴う乾酪壊死のない肉芽腫性病変で抗酸菌は認めなかった。経過観察とし、ポリープは自然消退した。結核の治療開始時に存在しないポリープが終了直前に指摘される例は稀である。本例では時相がかなり遅いものの、いわゆる初期悪化とされる結核菌に対する宿主免疫反応が、遅発性の気管支ポリープ発生に関係しているものと思われた。

**キーワード：**気管支ポリープ、初期悪化、時相の遅れ

## Case Report

BRONCHIAL POLYP AS A PARADOXICAL REACTION  
EMERGED AT THE END OF ANTITUBERCULOUS TREATMENT:  
A CASE REPORT

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**Abstract** A 44-year-old man presented to our clinic for the evaluation of an abnormal chest shadow detected during an examination following contact with a tuberculosis patient. Chest computed tomography findings of granular shadow in the left lung and lymph node enlargement from the left hilum to the mediastinum were suggestive of pulmonary tuberculosis. Based on a positive finding on the interferon gamma release assay, we diagnosed the patient with pulmonary tuberculosis and initiated anti-tuberculosis treatment. Subsequently, we confirmed the diagnosis based on a positive finding in bronchial lavage fluid culture. However, before the completion of treatment, the patient exhibited cough symptoms; therefore, we performed a chest computed tomography scan after completion of anti-tuberculosis treatment. The scan showed polyp-like shadows in the bronchial lumen at the trachea branch and entrance to the left lower lobe. Bronchoscopy revealed a polyp-like protuberance that we had not detected during the initial bronchoscopy; we performed biopsy of this mass. Histological examination revealed non-caseous granuloma and multinucleated giant cells, without the presence of acid-fast bacteria. We considered that the

polyp was formed as a result of a paradoxical reaction and did not restart anti-tuberculosis therapy. One year later, we confirmed polyp resolution by chest CT. Polyps which do not exist at the initiation of anti-tuberculosis treatment are rarely noted prior to the end of treatment. In this case, despite considerable delay, the host immune reaction to *Mycobacterium tuberculosis* (i.e., initial deterioration) was related to the delayed occurrence of a bronchial polyp.

**Key words** : Bronchial polyp, Paradoxical reaction, Late onset

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## 肺全摘術後残存胸腔内に貯留した胸水から *Mycobacterium fortuitum* が検出された 1 例

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1 内藤恵里佳    1,2 四宮 俊    3 二反田博之    2 小林 国彦  
1 永田 真

**要旨：***Mycobacterium fortuitum* は迅速発育型の非結核性抗酸菌であり，呼吸器感染症の起因菌となるが，胸腔内感染症の報告はほとんどない。今回われわれは肺全摘術後残存胸腔に air-fluid level を認め，*M. fortuitum* による有癭性膿胸が疑われた症例を経験した。症例は 70 歳，男性。肺癌により右肺全摘術後で gefitinib を内服中に発熱と，術後右胸腔に air-fluid level を認め入院した。喀痰は出ず，胸水は少量で穿刺できず，抗菌薬を投与したが改善が認められなかったため審査胸腔鏡を施行。採取した胸腔内組織で抗酸菌鏡検陽性，培養で *M. fortuitum* が検出された。肉眼的に気管支断端瘻は確認されなかったが，有癭性膿胸を疑い，気管支充填術，開窓術を施行した。当該抗菌薬による治療を 1 年 6 カ月継続し終了。以後再発は認められていない。一般的抗菌薬無効の胸水貯留が認められた場合は *M. fortuitum* を含む抗酸菌感染症も疑い，積極的な外科的検査と集学的治療の検討が求められることが示唆された。

**キーワード：***Mycobacterium fortuitum*，胸水，膿胸，肺癌



## — Case Report —

A CASE OF *MYCOBACTERIUM FORTUITUM* DIAGNOSED  
BY PLEURAL EFFUSION IN THE REMAINING THORACIC CAVITY  
AFTER TOTAL RIGHT PNEUMONECTOMY

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<sup>1</sup>Erika NAITO, <sup>1,2</sup>Shun SHINOMIYA, <sup>3</sup>Hiroyuki NITANDA, <sup>2</sup>Kunihiko KOBAYASHI,  
and <sup>1</sup>Makoto NAGATA

**Abstract** [Background] *Mycobacterium fortuitum* is a rapidly growing, non-tuberculous mycobacterium that can cause respiratory infection. However, pleural infection, such as pleuritis with effusion or empyema, is rare.

[Case] A 70-year-old male patient received right pneumonectomy due to lung cancer and was treated with gefitinib. The patient presented with a high fever and an air-fluid level in the postoperative right pleural cavity. He showed no sputum and the amount of pleural effusion was too small to be drained. The patient was treated with antibiotics (doripenem), but c-reactive protein levels remained high. We suspected intrapleural infection, such as pleuritis or empyema, and diagnostic video-assisted thoracic surgery (VATS) was performed. White coats and pleural effusion were observed in the remaining right pleural cavity. Microbiological analysis revealed the presence of *M.fortuitum*. Bronchopleural fistula was not diagnosed by VATS or bronchofiberscopy, but *M.fortuitum* was detected in transtracheal aspirated sputum. We therefore suspected empyema with fistula and performed endobronchial closure of the bron-

chopleural fistula, followed by fenestration and a chemotherapy regimen comprising clarithromycin, levofloxacin, and imipenem/cilastatin for 18 months.

[Conclusion] In cases with antibiotic-resistant pleural effusion cultures, mycobacterial infection should be considered and an aggressive surgical plan and multidisciplinary approach to treatment might be meaningful.

**Key words** : *Mycobacterium fortuitum*, Pleural effusion, Empyema, Lung cancer

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## 「結核の統計2019を読む」～外国出生医療従事者の結核

河津 里沙 内村 和広 濱口 由子 大角 晃弘

**要旨：**〔目的〕外国出生医療従事者の結核について、近年の届出数の推移や疫学的特徴、治療成績を検討することを目的とした。〔方法〕2010年1月1日から2018年12月31日の間に、結核登録者情報システムに新登録された外国出生結核患者で、職業が「医師」・「看護師、保健師」・「その他の医療職、介護職」のいずれかに該当する者を対象とし、活動性結核の届出数の経年変化と主な属性について、それぞれ日本生まれと比較した。〔結果〕外国出生患者の医療従事者の68.8%（117/170）が20～39歳であり、75.9%が東南アジアの結核高蔓延国出生者であった。また78.2%が「その他の医療職、介護職」で、近年増加傾向にあった。治療成績は転出の割合が高かった。〔結論〕外国出生結核患者における医療従事者の8割弱が「その他の医療職、介護職」であり、その数は今後も増えていくと考えられる。「その他の医療職、介護職」は発病した際の自身の健康への影響はもちろん、日本の医療・福祉における人出不足を補う重要な人材として社会的なインパクトも小さくない。外国人労働者の受け入れ体制の整備の一環として、結核対策を進めていく必要がある。

**キーワード：**結核，外国出生者，医療従事者

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**Materials**

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**TUBERCULOSIS AMONG FOREIGN-BORN HEALTHCARE WORKERS IN JAPAN**

Lisa KAWATSU, Kazuhiro UCHIMURA, Yuko HAMAGUCHI, and Akihiro OHKADO

**Abstract** [Objective] To analyze the trend and characteristics of tuberculosis among foreign-born healthcare workers in Japan.

[Methods] We extracted foreign-born tuberculosis patients who had been notified to the Japan Tuberculosis Surveillance System between January 2010 and December 2018, and whose profession was recorded as either “physician”, “nurse or public health nurse” or “care givers for the elderly and other healthcare workers”, and analyzed the trend in reported case numbers, main characteristics and treatment outcome. Where appropriate, comparison was made with Japan-born counterpart.

[Results] 68.8% (117/170) of the notified foreign-born TB patients were aged between 20 and 39, and 75.9% were born in high-TB burden countries of Southeast Asia. 78.2% were “care givers for the elderly and other healthcare workers”, and the number of notified cases was on increase. As for the treatment outcome, the proportion of those who have transferred out was high.

[Conclusion] Approximately 80% of the foreign-born

healthcare workers notified with TB was “care givers for the elderly and other healthcare workers”, and the number is expected to continue to increase in the light of current Japanese immigration policy. TB will not only affect their personal health, but will likely to have significant social impact, given the nature of their work. TB control activities must be planned hand in hand with the more general policies to ensure health and welfare of foreign-born workers in Japan.

**Key words** : Tuberculosis, Foreign-born, Healthcare workers

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