

# FACTORS ASSOCIATED WITH NONTUBERCULOUS MYCOBACTERIUM PULMONARY INFECTIONS AMONG PATIENTS WITH POSITIVE ACID-FAST BACILLI STAINED SPUTUM IN KHON KAEN, THAILAND

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**Abstract:** Patients with sputum samples positive for acid-fast bacilli (AFB) are sometimes treated for mycobacterium tuberculosis (TB) infection but some have nontuberculous mycobacterium (NTM) infection which may result in treatment failure and delayed appropriate treatment. In this study we aimed to assess factors significantly associated with NTM pulmonary infection in order to guide initial treatment decisions for patients with AFB in their sputum. Study subjects were patients who presented to Srinagarind Hospital, Khon Kaen, Thailand with a positive sputum sample for AFB during January 2012 - March 2018. This study was retrospective review of study subjected charts. Subjects were divided into those confirmed to have NTM pulmonary infection (cases) and those confirmed to have pulmonary TB (controls); both culture proven. Chest radiography reports were also reviewed for each subject. We used logistic stepwise regression analysis to determine if factors were significantly NTM pulmonary infection or not. A total of 20 cases and 60 controls were included in the study. The median age of cases was 61 years (quartile (Q)1: 58.5, Q3: 72.5) and the median age of controls was 49.5 years (Q1: 31, Q3: 62.5) ( $p < 0.01$ ). Sixty-five percent of cases and 32% of controls were female ( $p < 0.01$ ). The common symptoms in cases were cough ( $n=20$ , 100%), hemoptysis ( $n=9$ , 45%) and weight loss ( $n=9$ , 45%). The common symptoms in controls were cough ( $n=57$ , 95%), weight loss ( $n=51$ , 85%), and fever ( $n=41$ , 68%); 18.3% of controls had hemoptysis. The most common underlying disease among cases was bronchiectasis (35%) and among controls was diabetes mellitus (22%). The common chest radiograph findings among cases were bronchiectasis ( $n= 16$ , 80%), reticular infiltrations ( $n=9$ , 45%), reticulonodular lesions ( $n=7$ , 35%) and atelectasis ( $n=7$ , 35%). The common chest radiograph findings among controls were a cavitory lesion ( $n=23$ , 38.3%) and patchy infiltrations ( $n=36$ , 60%). Factors significantly associated with cases were age  $>50$  years ( $p=0.02$ ), female sex ( $p<0.01$ ), hemoptysis ( $p=0.01$ ), bronchiectasis on chest radiograph ( $p<0.01$ ) and no cavitory lesions on chest radiograph ( $p=0.04$ ). These five independent predictors gave a clinical prediction model for pulmonary NTM infections with area under the receiver operating characteristic curve (AUC ROC) of 0.96 (95%CI: 0.92-0.99). Future studies are needed to determine if these can be applied clinically at the study institution.

**Keywords:** NTM pulmonary infection, sputum AFB positive smear associated factors.

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