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Letter to the Editor

Absence of legionellosis in patients with community-acquired pneumonia requiring hospitalization



Dear Editor,

Community-acquired pneumonia (CAP) is associated with a high morbi-mortality in the general population. The prevalence of CAP varies between 8 and 15 cases per 1000 people, with higher prevalence in the extremes of age. In the USA, in 2005, there were 1.3 million hospitalizations due to pneumonia.¹ *Legionella* spp. has been implicated in 1–5% of CAP cases.² Despite the scarce reports on legionellosis in Brazil,^{3,4} very limited data are available from cohort studies.⁵ In order to investigate the prevalence of legionellosis among patients with CAP, here we report the results of a prospective survey conducted in a 1200-bed tertiary Brazilian hospital, between October 2010 and July 2013.

Adult patients (>18 years old) with suspected CAP admitted to Santa Casa de Porto Alegre (Brazil) were considered for inclusion in this study. CAP was diagnosed in the presence of a new lung infiltrate, and at least one of the following: sputum production, fever higher than 38 °C, cough or abnormal breath sounds. In order to avoid the inclusion of patients with health care associated pneumonia, patients with a history of hospitalization in the last three months were excluded. After consenting to participate in the study, a urine sample was obtained for *Legionella* urinary antigen test (BINAX Inc., USA). A respiratory sample (sputum, tracheal aspirate or bronchoalveolar lavage fluid) was also obtained for *Legionella* real time polymerase chain reaction (qPCR) testing (Nanogen Inc., USA). DNA was extracted using ExtraCell DNA Extraction Kit (Nanogen Inc., USA). An internal extraction control (CPE-DNA[®]) was used to monitor for the presence of PCR inhibitors. Medical records were reviewed to obtain data on patients' demographics, history of current disease, underlying diseases, smoking history, and antibiotic exposure in the last two weeks. Curb 65 and IDSA/ATS Pneumonia Severity Index for CAP were used to evaluate the severity of CAP. The study was approved by the ethics committees of participating institutions.

A total of 95 patients were included (56.8% men). The mean age (\pm standard deviation, sd) was 61.7 \pm 19.8 years. The most common co-morbidities were high blood pressure (26.8%), chronic obstructive pulmonary disease (22.1%), and diabetes

mellitus (20.0%). Smokers represented 18.9% of the patients ($n=18$) and additionally 22.1% ($n=21$) were former smokers. Median duration of symptoms at study inclusion was eight days (range, 1–60 days), 84 (88.4%) patients were on antibiotics and 35 were on empirical treatment for *Legionella* sp. Twenty-nine patients fulfilled the IDSA/ATS criteria for severe CAP, including 17 who needed invasive mechanic ventilation. According to Curb 65, 31.6% ($n=30$) of the patients scored ≥ 2 . The PaO₂/FiO₂ ratio was evaluated in 53 patients – mean value (\pm sd) was 240 \pm 88. Ten (10.5%) patients needed ICU support. The overall in-hospital mortality was 17.9% ($n=17$). No patient was found to be infected by *Legionella pneumophila* in this study.

As far as we are concerned this is the first prospective study performed in Brazil in which modern diagnostic tools were used to determine the prevalence of legionellosis in patients with CAP. The study was originally conceived to compare two diagnostic tests in patients with legionellosis: urinary antigen test and qPCR in respiratory samples. Since all samples tested negative for *Legionella* spp., this comparison was obviously not performed. qPCR test may provide results in a few hours, and has the potential to detect *Legionella* species belonging to any of the serogroups. Since qPCR has similar or higher sensitivity than sputum culture,¹ qPCR has the potential to become the gold-standard for the diagnosis of legionellosis. The urinary antigen test has the advantage of being a fast (~ 15 min) and highly sensitive (<95%) test. Regardless of the diagnostic test being used – i.e., urinary antigen or qPCR – the main question appears to be: is legionellosis really relevant in terms of frequency as a cause of CAP? The results of our study are indicative of a rather low frequency.

The main limitation of our study relies on being a single-center study in which a limited number of patients were included. Our results suggest that the frequency of legionellosis in patients with CAP admitted to the hospital is too low to justify widespread empirical coverage against *Legionella* spp. Perhaps legionellosis is mostly occurring in outbreaks. Continuous surveillance and availability of data from additional medical centers are ultimately required to understand the low frequency of legionellosis found in our medical center.

Conflicts of interest

The authors declare no conflicts of interest.

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