



Nosocomial exposure to tuberculosis: a snapshot of South Korea

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Tuberculosis (TB) is the leading cause of death from a single infectious agent. It accounted for approximately 10.0 million cases and 1.2 million deaths worldwide in 2019 [1]. South Korea is still an intermediate-TB burden country with an incidence of 39 cases per 100,000 people in 2020 [2]. Effective TB control programs need to detect active TB patients, isolate them immediately, and treat them appropriately. These will prevent TB transmission and subsequently work towards the World Health Organization's End TB Strategy.

TB is highly prevalent in hospitals, and healthcare workers constantly have a higher risk than the general population [3,4]. Aside from healthcare workers, hospitalized patients are also at risk. In South Korea, more than 50% of hospital rooms contain four beds, and family members often tend to their hospitalized relatives [5]. This environment is vulnerable to TB transmission, when there are hospitalized patients with undiagnosed active TB. Although there have been studies evaluating the issue in one or two tertiary hospitals [6-8], the nationwide burden of nosocomial TB exposure is unknown.

The article in this issue of the *Korean Journal of Internal Medicine* by Kim et al.

[9] addressed this using Korean health insurance claim data from 2012 to 2016. TB cases were defined using prescriptions of drug susceptibility testing for TB plus anti-TB medications, which denoted culture-proven TB. The infectious period of the TB cases was defined as the duration between 3 months before a doctor's suspicion of TB in cases with respiratory symptoms (1 month prior in those without symptoms), and 1 day before the start of anti-TB medications. The primary outcome of this study was the number and days of hospitalization without isolation during the infectious period. The study identified 7,186 cases with 94,636 person-days of hospitalizations with unrecognized active TB. To stack the odds in favor of TB transmission, patients with unrecognized active TB underwent procedures for generating aerosols, including bronchoscopy (29%), nebulizer therapy (28%), and endotracheal intubation (13%).

Elderly patients accounted for a large proportion of hospitalizations with unrecognized active TB. In agreement with the study results, a previous research conducted in South Korea also showed that delayed TB diagnoses were more common in older populations than in younger populations [6-8]. This was likely caused by the atypical respiratory symptoms and radiologic findings, com-

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bined with aspiration pneumonia or malignant lesions, in elderly patients. This is exacerbated by their multiple comorbidities, resulting in hospitalizations in departments aside from the pulmonology or infectious disease departments. In such cases, the possibility of unrecognized TB can be overlooked if there is no high index of clinical suspicion. The proportion of elderly TB cases has considerably increased from 27.5% (in 2008) to 48.5% (in 2020) of newly diagnosed TB patients aged over 65 years in South Korea [2]. Based on this, the nosocomial TB exposure is expected to worsen. This study highlighted the importance of considering TB in elderly patients even when they are hospitalized for other diseases.

In addition to the particular attention to elderly patients, the integration of multiple aspects, including radiological screening of presumed TB lesions by radiologists or artificial intelligence, prompt microbiological detection of TB using the Xpert MTB/RIF assay or other advanced methods, and administrative support for screening process or isolations, effectively diminishes the burden of nosocomial TB exposure. Further research is warranted to develop such an integrative approach to detect TB in our healthcare system.

Some factors should be considered when interpreting the study results. The authors used operational definitions exquisitely. However, given the study using claim data, there is no information on the mycobacterial burden (acid-fast bacilli smear positivity and quantity) or radiologic extent (bilateral disease and presence of cavities), which are essential in determining TB infectivity [10]. In the future, combining the claim data with TB patient data, obtained by the Korea Disease Control and Prevention Agency, will provide more accurate estimation of the burden of nosocomial TB exposure in South Korea. Additionally, healthcare in South Korea has been affected by the Middle East Respiratory Syndrome epidemic and coronavirus disease 2019 pandemic. Hence, it will be interesting to compare the study results acquired from 2012 to 2016 claim data with those acquired from 2017 to 2021 claim data and assess the changes in the burden of nosocomial TB exposure. Despite some

caveats, the study results are invaluable because facing our reality is the first step in ending TB.

Conflict of interest

No potential conflict of interest relevant to this article was reported.

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