Letter to the Editor

Infection-control practices in the COVID-19 pandemic call for an evidence-based management system in psychiatric hospitals

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Psychiatric hospitals generally have a small and specialized supply of drugs, materials, equipment, and facilities, and also specialized allocation of human resources, compared with comprehensive medical institutions. Therefore, when they are faced with the outbreak of a major respiratory infectious disease like the novel coronavirus disease 2019 (COVID-19), the investment and stock of human resources and material resources such as non-psychiatric drugs, common disinfectants, and personal protective equipment are particularly insufficient, which increases the risks of nosocomial infection.

The characteristics of psychiatry hospitals and their real experience in infection control during the COVID-19 pandemic (Yang et al., 2020) point to the necessity to initiate a responsive and effective infection control system against outbreaks of major respiratory infectious diseases including COVID-19, which may reemerge as a chronic epidemic similar to influenza (Yang and Jin, 2020). On the one hand, it is necessary to establish and regularize an integrated management framework based on official guidelines and professional experience, which includes several component systems of different functions as follows.

- To specify the definition and characteristics of major respiratory infectious diseases that activate the hospital infection control system
- To determine organizational operation, measures and procedures, and multi-disciplinary and multi-department coordination for infection control
- To implement risk assessment and early warning
- To allocate personnel, materials, and funds for prevention and control of nosocomial infection
- To initiate the mechanism including a pre-assigned team for disseminating information on prevention and control of major respiratory infectious diseases
- To analyze and evaluate the effectiveness of infection prevention and control afterwards

On the other hand, an evidence-based infection control model is needed to promote the effectiveness of infection control in hospitals. Infection control practices during the COVID-19 outbreak rely largely on either laws and regulations or expertise and experience. Further steps should be taken to initiate a both data- and experience-driven risk model of hospital infection control during outbreaks of major respiratory infectious diseases, using both data of personnel, materials, facilities, and funds in hospitals and professional experience in psychiatry, respiratory medicine, hospital infection, and other fields in the COVID-19 pandemic. Based on hazards of the disease and hospital conditions, the model aims to predict infection control plans, procedures, material reserve, emergent personnel deployment, and other critical technical suggestions. For example, a neural network based on sparse linear regression (Gan et al., 2014) may be used to obtain eigenvectors of personnel quantity, material demand, and fund allocation, which will be taken as input features of the neural network. Support vector machines (Steinwart and Christmann, 2008) may be utilized to alter the dimension of eigenvectors and convolutional neural networks (Krizhevsky et al., 2017) could be employed to achieve classification or prediction following feature training.

In short, it is a future direction to combine professional experience with data modeling and machine learning to develop a highly effective and responsive system for hospitals to control infections of major respiratory infectious diseases. We need learn from the data in the COVID pandemic to facilitate future policy decision-making in context of psychiatric hospital management in order to protect our patients and healthcare workers (Tandon, 2020).

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Declaration of Competing Interest

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