EDITORIAL

Listening to SARS: Lessons for Infection Control

Throughout recorded history, epidemics have relentlessly descended on societies, disturbing their previous harmony. Yet the arrival of these epidemics is usually greeted with disbelief as a shocking and unanticipated event. So it is with the severe acute respiratory syndrome (SARS), which has infected at least 8500 people in 30 countries and claimed the lives of 765 (9%). In its wake, the health care and national economic systems of some countries have been seriously disrupted. As hospitals respond, we suggest that they seize the opportunity to manage this outbreak in a way that prepares the medical community broadly for future epidemics.

Much has been learned about SARS since its recognition in southern China in February 2003. The etiologic agent has been identified as a novel coronavirus, new diagnostic tests have been developed, and the viral genome has been sequenced (1). Recently, an almost identical virus, although with 29 extra nucleotides, was isolated from palm civet cats bought in a food market in the city of Shenzhen (2). The civets are nocturnal members of the mongoose family, distantly related to feline cats, and considered a culinary delicacy in southern China. Unconfirmed reports suggest that the virus has also been isolated from several other exotic animals (3). Chinese food handlers, caterers, and chefs were overrepresented fivefold among the virus’s first victims, another clue suggesting that SARS is a zoonosis. Having crossed species from animals to people, SARS then spread from person to person.

The clinical course of SARS is challenging; Twenty percent of infected persons must be cared for in intensive care units, and the presence of diabetes or other comorbid conditions has been independently associated with a need for mechanical ventilation and with death (4). The incubation period is 2 to 10 days, and close contact is important, suggesting that large-droplet spread is the most common mode of transmission. This is further supported by the linear rather than exponential growth of the epidemic over time (5). Remarkably, approximately half of all victims in most countries are health care workers (4), and health care workers who use protective masks improperly while managing patients with SARS are more likely to become infected than those who use the masks properly (6). Occasionally, some patients are described as “superspreaders,” suggesting that droplet-nuclei (airborne) spread may have occurred.

The novel coronavirus can be found in the sputum, tears, blood, urine, and feces. It is shed in feces for 30 days and can survive on hard surfaces for 1 or more days. This raises the specter of possible transmission by fomites in the hospital. Thus, hospital epidemiologists need to consider multiple pathways for infection: most commonly through large droplets and secretions, but otherwise possibly through blood transfusions or sharps injuries, droplet nuclei, or fomites. This portfolio of possible mechanisms surely indicates that assiduous infection control is essential for containment.

In this issue, Ho and colleagues (7) describe the transmission of SARS to 41 health care workers in a community hospital in Hong Kong. Because the index cases were unrecognized in patients hospitalized on a general medical ward, health care workers did not institute protective measures. The subsequent establishment of an isolation ward and the very strict use of infection-control measures are credited with containing the virus’s spread.

All cases of SARS should be managed in airborne isolation with negative air pressure rooms. Health care workers should use gowns, gloves, face shields, and N95 masks. Special care should be practiced in managing body fluids and avoiding sharps injuries. Meticulous handwashing is essential between all patient contacts and even after removing gloves. Bedside tables and all equipment that could be touched by health care workers should be disinfected twice daily. Patients with SARS should not be permitted to donate blood for at least 6 weeks after illness.

All institutions should pause briefly to reexamine their capacity to manage an outbreak of contagious respiratory infections. In the era of bioterror, SARS, the annual epidemics of influenza, and the nascent appearance of monkeypox in the United States, the number of negative air pressure rooms in hospitals is important. We recommend that large hospitals develop plans for geographic clustering of approximately 10 negative air pressure rooms that could be used in an urgent situation. The rationale is that a small group of health care workers with enhanced skills in infection control could be trained to manage patients with contagious respiratory diseases. Currently, isolation rooms in most U.S. hospitals are scattered, and patients with SARS could expose many teams of health care workers on various floors to the virus.

Patient-to-patient spread of SARS from an initially unrecognized case remains a huge challenge. Rapid diagnostic tests with early isolation of confirmed case-patients will be extremely helpful. However, the best that physicians can do in the meantime is to use their clinical acumen to suspect and isolate possible case-patients until the diagnosis is confirmed. In the face of an uncontrolled epidemic, patients in the emergency department or clinic who have fever and respiratory symptoms should be offered a diagnostic test with early isolation of confirmed case-patients. The subsequent establishment of an isolation ward surely indicates that assiduous infection control is essential for containment.

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age patients. This is a costly measure but may be essential in controlling transmission.

The novel coronavirus is one of the latest in a series of continually emerging pathogens to challenge our global society. It has distinguished itself by a remarkable ability to amplify its communicability within the hospital setting, becoming an almost “perfect” nosocomial pathogen. The critical lessons learned from managing the current SARS epidemic should be institutionalized as rational preparations for the next one.

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References

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