tions might involve a "war room" strategy, with weekly meetings of the personnel involved and distribution of updates on the number of contacts tested and their results. In addition, institutions should consider mock exercises in investigation management to become more familiar with these issues.

ACKNOWLEDGMENTS

Potential conflicts of interest. All authors report no conflicts of interest relevant to this work.

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Presented in part: 18th Annual Scientific Meeting of the Society for Healthcare Epidemiology of America; April 5-8, 2008; Orlando, Florida (poster 5).

Infect Control Hosp Epidemiol 2009; 30:502-504

 0899-823X/2009/3005-0023$15.00. DOI: 10.1086/597230

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Management of Potential Laboratory Exposure to Avian Influenza (H5N1) Virus: Implications for Pandemic Planning

TO THE EDITOR—Since the emergence of the avian influenza (H5N1) virus, the medical community has been preparing for a possible influenza pandemic. The preparedness of our hospital was tested recently when local laboratory workers at the biosecurity level 3/4 Australian Animal Health Laboratory (East Geelong, Victoria) were potentially exposed to birds infected with avian influenza virus as a result of a fault in their personal respirators. There have been no documented cases of avian influenza contracted in the laboratory setting, but as scientists continue to work with this virus, it poses a potential risk.

The laboratory was undertaking research with an Indonesian isolate of the avian influenza (H5N1) virus, and 5 ducks had been experimentally infected with the virus in a physical containment level 3 animal room. Staff wore powered air-purifying respirators (provided by 3M and compliant with Australia/New Zealand Standards[1]) to protect themselves from airborne pathogens, in addition to standard personal protective equipment.

One of the staff members who had been working with the infected birds discovered that the air filter cartridge on her powered air-purifying respirator was not attached. It was ascertained that 2 other staff members had used the same powered air-purifying respirators in the past week while working with the birds, and neither could remember whether the filter had been correctly attached. One of these workers experienced upper respiratory tract symptoms at home. Because the Australian Animal Health Laboratory does not have facilities for human patients, the exposed workers were assessed at our hospital (Barwon Health; Geelong, Victoria), the local tertiary care referral center. The hospital had been involved in a recent multicenter simulation exercise to assess the adequacy of procedures for suspected cases of avian or pandemic influenza[2] and has management protocols for suspected cases of severe acute respiratory syndrome and highly pathogenic influenza.

Assessments of the laboratory workers were performed in the only negative-pressure respiratory isolation room in the busy emergency department. The patients were transported individually to the hospital in private cars and were assessed sequentially. The workers were instructed to enter through the ambulance bays, rather than through triage, to avoid contact with other patients. The importance of communication was highlighted when one worker entered the emergency department unannounced, rather than waiting for our signal, potentially creating an opportunity for viral spread. There were further difficulties with congestion around the ambulance bays, because hospital security did not coordinate traffic.

Clinical assessments and baseline pathologic investigations were performed for each worker, including obtainment of throat swab specimens for polymerase chain reaction (PCR) analysis and blood specimens for serologic analysis. Two of the patients were asymptomatic, and the third had symptoms of an upper respiratory tract infection that were not consistent with influenza. Pathology staff members personally delivered the double-bagged pathologic specimens to the laboratory. The hospital pneumatic chute was not used.

Studies of human influenza virus have found that throat swab specimens have lower diagnostic yield, compared with sputum and nasal aspirate specimens.[3] However, in Indonesian clusters of avian influenza (H5N1), throat swab specimens had a higher yield for the detection of the virus by reverse-transcriptase PCR, compared with nasal swab specimens.[4] Collection of throat swab specimens also generates fewer aerosols and is safer for staff, compared with collection of nasopharyngeal aspirate specimens.

The workers were not unwell; therefore, admission to the hospital was not warranted. We recommended that they be quarantined at home for 7 days from the day of their potential exposure. Reports of previous outbreaks of avian influenza (in humans) in Hong Kong (1997), Vietnam (2004 and 2005), and Cambodia (2005) have shown that the median time from exposure to onset of illness was 2–4 days (ranging up to 8 days).[5] The workers were prescribed a prophylactic course of oseltamivir. A second throat swab specimen from each worker was sent for PCR at the end of the quarantine period, and serologic analysis was repeated 14 days after the quarantine period (approximately 4 weeks after exposure). None of the workers had either a positive PCR result or evidence of seroconversion.

Home quarantine is used infrequently in Australia; however, during the 2003 outbreak of severe acute respiratory syndrome, it was a major control measure used in China and Canada.[6,7] A review of the psychological impact of quarantining on persons during the outbreak of severe acute respiratory syndrome found that a substantial proportion displayed symptoms of depression and posttraumatic stress disorder.[8] Up to one-half of the participants felt that they had not received adequate information regarding aspects of home infection control, and not all of the participants adhered to quarantine recommendations. The laboratory workers described here similarly felt that they had not received clear instructions about quarantine restrictions, and all found the process to be stressful. There is a paucity of guidelines that address issues of quarantine and isolation outside the hospital or institutional setting.

This incident highlighted to our institution a number of issues relevant to hospital pandemic influenza planning and infection control. The dedicated influenza kits in the emergency department had been tampered with, and not all personal protective equipment was readily available. In addition, the standard gowns in our kits were too short for taller members of staff, leaving skin on their forearms exposed. Not all staff members were familiar with appropriate procedures for wearing and removing personal protective equipment. Swaminathan et al.[2] observed that, even with widespread availability of personal protective equipment, 8%–41% of close contacts are likely to require postexposure prophylaxis after caring for a patient with avian or pandemic influenza because of inappropriate use of personal protective equipment.

The importance of staff feedback was also emphasized. Although a list was compiled of all staff members involved in the assessments, the staff were not informed that no further follow-up was required after the incident. It was requested that the outcomes of the assessments should have been communicated to the involved emergency department staff as a priority.

The stress on staff managing highly pathogenic infectious diseases should not be underestimated. Lin et al.[9] studied the psychological effect of the outbreak of severe acute respiratory syndrome on staff and found a significant difference in the psychological impact of working in the emergency department, compared with the wards where there is a lower risk of exposure to an infectious pathogen.

This incidence highlighted the importance of hospitals having regular staff training about the use of personal protective equipment and a critical incident response plan involving both clinical and nonclinical staff, including security and environmental services. Clear communication with all involved, including pathology services, is essential. Patients who are quarantined at home need to be given clear and, preferably, written instructions. Staff debriefing and feedback after any critical incident is essential.

ACKNOWLEDGMENTS

Potential conflicts of interest. All authors report no conflicts of interest relevant to this article.

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Infect Control Hosp Epidemiol 2009; 30:504-506

 0899-823X/2009/3005-0024$15.00. DOI: 10.1086/597065

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