

Viral Infections

248. Does Knowledge and Positive Attitudes Regarding Avian Influenza (H5N1) have Any Impact On Infection Control and Influenza Vaccination Practices Among Thai Healthcare Workers?: A Survey of Two Medical Centers

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Background: Little data is available concerning healthcare workers' (HCWs) knowledge & attitudes regarding avian influenza (H5N1), infection control practices against suspected or documented droplet or airborne infections, and influenza vaccination practices in an H5N1-endemic area.

Objectives: To evaluate the impact of HCWs' knowledge and attitudes regarding H5N1 on infection control practices against suspected or documented droplet or airborne infections, and influenza vaccination practices in an H5N1- endemic area.

Methods: We designed a cross-sectional survey of HCWs knowledge and attitudes regarding H5N1, current infection control practices against suspected or documented droplet or airborne infections, and influenza vaccination practices at the only 2 medical centers in Pratumthani, Thailand [Thammasat University Hospital (TU) and Pratumthani Hospital (PH)]. In 2004, the Thai government started offering free influenza vaccination to HCWs at government hospital (PH), but not university hospital (TUH). The survey contained questions about demographics, occupation, and previous experience caring for patient with or suspected of H5N1. HCWs were also surveyed on their knowledge and definition for H5N1, mode of transmission, and attitudes toward H5N1. Current infection control practices for dealing with patients with suspected or documented droplet or airborne infections and influenza vaccination practices were elicited.

Results: There were 322 HCWs (215 from TUH and 107 from PH) participated in the survey (response rate 86%). 316 (95%) correctly defined H5N1 as a contagious infection caused by a virus that can affect all species of birds, 88% (282) knew that H5N1 can be transmitted by touching infected eggs or poultries and can be transmitted from patients to healthcare workers. All HCWs identified poultry and wild birds as common vectors, and 85% (275) answered all questions correctly. Although 90% (289) accepted the personal risk of caring for H5N1-infected patients, they would not consider a job change even if they (95%; 306) were required to take care of H5N1-infected patients. 150 HCWs (47%) reported receiving influenza vaccination in the previous influenza season. Location (PH vs. TUH; aOR, 1.5; 95% CI, 1.05-65.9), and having had experience caring for patient with or suspected of having H5N1 (aOR, 2.6, 95% CI, 1.2-71.1) were associated with reporting being vaccinated.

Conclusions: Our study suggests the need to monitor infection control practices during pandemic influenza to help minimize nosocomial influenza transmission in hospitals in H5N1 endemic areas. Improvement of influenza vaccination administration may be promoted by education and free vaccination campaign.

249. Influential Factors in Healthcare Workers' Decisions Regarding Influenza Vaccination

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Background: Many healthcare workers (HCW) do not get influenza immunization, despite recommendations to do so.

Objective: Following an immunization campaign that saw our HCW immunization rate increase from 43% to 67%, we conducted a survey to better understand factors that led to acceptance or rejection of vaccine.

Methods: Participation in an anonymous online survey was encouraged for all 9,500 employees of an academic medical center to assess demographics, vaccine receipt, and personal knowledge and beliefs about influenza vaccination.

Results: 1,994 completed the survey for a response rate of 21%; 83% of survey responders reported receiving vaccine during the last season. Reported vaccine receipt increased with age, with vaccination rates of 68% for HCW age 18-24 years, 80% for HCW age 25-34 years, 87% for HCW age 35-54 years and 95% for HCW age 55-64 years ($p < 0.0001$ for trend). 94% of white and 78% of African American respondents reported that they received the vaccine ($p < 0.0001$). A history of caring for a patient with influenza was associated with a higher vaccination rate ($p = 0.0005$). HCW who were vaccinated reported that the main reason(s) they got vaccinated were protection of self (87%), protection of family (39%), protection of patients (32%), convenience of vaccination (17%), and free shots (15%). HCW who declined vaccination reported that the main reason(s) they did not get vaccinated were simply not wanting to because vaccination is a "personal decision" (50%), fearing vaccine side effects (31%), feeling like vaccination was forced (24%), "other" reasons (20%) such as confidence in natural immunity, and no personal history of influenza infection (19%). Of all participants, HCW who listed protection of self as the top benefit of vaccination had higher rates of vaccine receipt than HCW who reported that the chief benefit is protection of patients ($p < 0.0001$).

Conclusions: In our institution with a relatively high HCW vaccination rate, differences in vaccine acceptance by age and race exist. Personal beliefs on the benefits and risks of immunization impact vaccination rates. These findings can help target audiences and tailor educational messages in future immunization campaigns.

250. Can Routine Laboratory Tests Discriminate Between Norovirus and Other Causes of Gastroenteritis Among Hospitalized Patients?

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Background: Hospitalized patients with Norovirus (NV) gastroenteritis present with

vomiting and/or diarrhea, which may also be due to many other causes. During community outbreaks of NV, use of a broad case definition may result in inappropriate isolation of hospitalized patients with gastroenteritis due to other causes, and can lead to unnecessary disruption of patient care services.

Objective: To determine if commonly-obtained laboratory tests can differentiate patients admitted to a hospital with NV from those admitted with similar clinical findings during a community outbreak affecting a university-affiliated hospital.

Methods: During a NV outbreak, a suspected case of NV gastroenteritis was defined as a hospitalized patient who met any one of the following criteria during a 24-hr period: 3 episodes of diarrhea, 2 episodes of vomiting, or 1 episode of vomiting + 1 episode of diarrhea. Patients with suspected NV had a stool sample tested for NV by PCR methods at Yale New Haven Hospital Virology Laboratory on a fee-for-service basis. Patients with a positive NV PCR were defined as cases, and those with a negative PCR were defined as controls. We retrospectively obtained data on demographics, date of admission, and the following laboratory tests performed upon admission: WBC, absolute lymphocyte and neutrophil counts, and serum sodium and potassium levels. The absolute lymphocyte count (ALC) was followed for up to 4 days after admission. Continuous variables were compared using Student T tests.

Results: During a 5-month outbreak period in 2006-2007, 105 patients with suspected NV gastroenteritis were NV PCR-positive (cases) and 195 were NV PCR-negative (controls). There were no significant differences between cases and controls with respect to age, gender, WBC, or serum Na or K levels. The mean absolute neutrophil count for cases (10,591) was higher than that for controls (9,053), but did not reach statistical significance. The mean ALC for cases was significantly lower than that for controls on admission (855 vs 1191, $p = 0.02$), day 1 (855 vs 1252, $p = 0.01$), day 2 (898 vs 1296, $p = 0.006$) and day 3 (1181 vs 1706, $p = 0.032$), but not on the 4th hospital day.

Conclusions: 65% of patients admitted with suspected NV had stool samples negative for NV by PCR, suggesting that the published case definition used is too broad, leading to substantial over-isolation of patients. ALCs within the first few days of admission are significantly lower for patients with NV gastroenteritis than those among patients who most likely had vomiting and/or diarrhea due to other causes. ALCs should be assessed further to determine if they can be used to refine case definitions used during institutional outbreaks of NV gastroenteritis. An improved NV case definition may prevent unnecessary isolation of patients without NV, especially when NV PCR results are delayed for several days or are not available.

251. Use of Antiviral Therapeutics for Avian Influenza (H5N1) in Two Thai Medical Centers: Survey Findings and Implications for Pandemic Preparedness

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Background: Little data is available concerning knowledge, attitudes and prescribing

patterns of antiviral medications among Thai physicians in avian influenza (H5N1) endemic regions.

Methods: We conducted a cross-sectional survey of Thai physicians in H5N1 endemic regions to describe knowledge, attitudes and prescribing patterns of antiviral medications from July through December 2006.

Results: The survey was completed by 150 of 169 physician respondents (89%), 24 (16%) of whom prescribed antiviral medication to 36 patients with suspected avian influenza (H5N1). By multivariate analysis, practice location (adjusted odds ratio [aOR], 2.4; 95% CI, 1.05-6.9), having a high index of suspicion for H5N1 in a patient (aOR, 4.5; 95% CI, 2.1-5.9), and belief that antiviral therapy decreased mortality (aOR, 3.6, 95% CI, 1.2-7.1) were factors associated with antiviral prescriptions. Six physicians (25%) prescribed antiviral medication to suspected H5N1 patients prior to the specimen collections, while 2 physicians (8%) prescribed prophylactic, 10-day, antiviral regimens. The most common reasons for not prescribing antiviral therapy to suspected case were "negative rapid test" (50%), "unavailability of antiviral medication" (42%), and "delayed patient presentation for treatment" (25%).

Conclusions: This analysis suggests opportunities exist to enhance physician knowledge of influenza H5N1 treatment and prevention practices in H5N1 endemic regions.

252. Clinical Presentation and Infection Control Approach to *Human Metapneumovirus* infection in Cancer Patients

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Background: *Human Metapneumovirus* (hMPV) is a newly discovered RNA virus causing respiratory disease primarily in children. It has been linked to severe lower airway disease in hematopoietic stem cell transplant recipients (HSCT) and other immunocompromised hosts. However, the clinical syndrome of hMPV in cancer patients is not well characterized and infection control approach to the infection is not established. We therefore reviewed our experience with hMPV from October 2006-07.

Objective: To characterize clinical illness from h MPV infection in cancer patients and assess infection control measures directed against this new pathogen.

Methods: Retrospective review of all hMPV detected by DFA and real time PCR at MSKCC from October 2006- October 2007.

Results: A total of 2069 nasopharyngeal swab and bronchoscopy samples on 1108 patients were submitted to the microbiology laboratory. Among these, forty samples on thirty patients (overall rate 2.7%) were positive for hMPV. Cases of Influenza A (54), Influenza B (25), RSV (52) and Parainfluenza (64) also were diagnosed during the same period. hMPV occurred year around and was most frequent in February.

PCR detected twice as many cases as DFA. For the 30 patients with hMPV, mean age was 36 years (median, 40), half were male, and only 10 were children. Sixteen (53.3%) had underlying hematologic malignancy including 12 (40%) HSCT recipients. Cough and fever were common. Persistent shedding was observed in one symptomatic patient for eighty days. Ten of 25 patients who had chest imaging studies had radiographic abnormalities. Healthcare-associated infection occurred in two patients and no sustained transmission was noted during this time period. One pediatric HCW developed hMPV possibly after exposure to an infected child. No deaths were attributed to hMPV. We use droplet precautions for all infected patients. Because the virus cannot be grown, initiation and discontinuation of isolation relies on cessation of symptoms and a negative PCR or DFA.

Conclusions: hMPV causes non-specific respiratory illness involving the upper and lower airway among cancer patients. PCR has higher sensitivity compared to DFA for the diagnosis of hMPV. We use droplet precautions and have only 2 nosocomial cases. We recommend that patients can be discontinued from droplet precautions if a negative PCR result is obtained from a respiratory specimen in an asymptomatic patient.