Nosocomial Influenza and Vaccination of Healthcare Workers

Dr. Helena Maltezou, Hellenic Center for Disease Control and Prevention
A Webber Training Teleclass

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«Οφελείν η μη βλάπτει ν»
“First do not harm”

Hippocrates (460-377 BC)

Seasonal influenza every year

- 3-5% of human population is affected each year
- 3-5 million serious infections
- 250,000 - 500,000 deaths
- peak of visits to health-care facilities
- peak of admissions in hospitals

Seasonal influenza in developed countries

- The most frequent vaccine-preventable disease
- Every year
  - 36,000 deaths in the United States
  - 40,000 deaths in the European Union

Epidemiology of nosocomial influenza

- Follows the activity of influenza in the community
- Extremely fast spread within closed settings
- Crowded wards and staff shortage facilitate influenza transmission and onset of outbreaks
- Very high influx and rapid turnover of patients in health-care facilities

Nosocomial influenza outbreaks

- Intensive Care Units
- Neonatal Intensive Care Units
- Pulmonary Departments
- Neurologic - Psychiatric Departments
- Bone Marrow Transplantation Units
- Long-Term Care Facilities

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Nosocomial influenza outbreaks (cont)

- Attack rate up to 55.6% among patients and up to 18.1% among personnel *
- Up to 25% case fatality rate among neonates in Neonatal Intensive Care Units (NICUs)**


Which patients are at risk from nosocomial influenza?

Nosocomial Influenza

Serious morbidity and mortality

- Patients with underlying diseases
- Immunocompromised patients
- Neonates and young infants
- Elderly


High risk groups of patients

- allogeneic bone marrow transplant recipient
- 68 y.o. with Chronic Obstructive Pulmonary Disease
- neonates in NICUs
- underlying diseases
- low vaccination rates
- limited immunologic response post - vaccination
- frequent use of health - care services
- frequent visits - admissions
- prolonged hospitalization

Outbreak of influenza A H1N1 2009 in a Oncology Department and a Bone Marrow Transplantation Unit

- 8 (38%) among 29 patients were infected
- 5 patients developed severe pneumonia
- 3 patients were transferred to the Intensive Care Unit
- 2 patients died of influenza and 1 due to his underlying disease
- 2 of the patients who survived remained under oxygen for 2 and 3 months, respectively.


Indirect impact of nosocomial influenza

- Increase medical costs
  (diagnosis, prolonged hospitalization, treatment, prophylaxis, isolation)
- Absence of health-care workers
- Disruption of health-care services


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Study of 1.561 nosocomial epidemics
- 38.5% closure rates in wards or departments during nosocomial influenza outbreaks.
- Influenza constituted the cause of closing a whole health-care facility because of an epidemic in 3 out of 10 cases.

Sources for spread of nosocomial influenza
- Patients with undiagnosed influenza
- Visitors
- Unvaccinated health-care workers

Health-care workers continue to work often despite the presence of influenza-like symptoms.

Modes of Influenza Transmission
- Inhalation of large particles (cough – sneezing)
- Direct or indirect contact
- Inhalation of small particles (aerosol – generating procedures)

Shedding of influenza virus
- In adults with underlying diseases and young children for >1 week
- In immunocompromised patients:
  - for weeks to several months
  - risk for emergence of resistance strains
  - risk for nosocomial spread

Influenza viruses may survive on surfaces and transfer to the hands of health-care personnel and vice versa.


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Influenza A H1N1 virus was detected on multiple occasions on the hands of health-care workers (HCWs) and in inanimate objects up to 17 days after the diagnosis of influenza and 72 h after discharge of the patient and the implementation of routine cleaning.

Macias et al. Controlling the novel (H1N1) influenza virus: don’t touch your face! Journal of Hospital Infection 2009;73:280-291

Why should HCWs get vaccinated against influenza?

in order to protect
• themselves – occupational infection
• their vulnerable patients
• the essential health-care services

HCWs vaccination against influenza

The Main preventive measure against transmission of influenza within health-care facilities

HCWs vaccine against influenza

The goal is to protect patients at high risk for complications from nosocomial transmission of influenza.

• Frequent visits – admissions
• Prolonged hospitalization

Herd immunity

Advantages from the implementation of influenza vaccination programs for HCWs within health-care facilities

1. Dunlop et al. Influenza vaccination instead of an intervention campaign targeting hospital staff. Infect Control Hosp Epidemiol 2006;27:529-531

Influenza vaccination of HCWs in long-term care facilities

• total mortality
• total mortality from influenza-like illness
• admissions in hospitals

1. Fother RL. Influenza vaccination of healthcare workers in long-term care hospitals reduces the mortality of elderly patients. JAMA 1997;278:16
2. Larner B. Effect of influenza vaccination of nursing home staff on mortality of residents: a cluster-randomized controlled trial. JAMA 1999;281:1005
4. Potter et al. Influenza vaccination of HCWs in long-term care facilities total mortality from influenza-like illness admissions in hospitals

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Vaccination against influenza of HCWs and nosocomial influenza

Onset of influenza nosocomial outbreaks when vaccination rates among HCWs were low


Vaccination coverage among HCWs

- low vaccination rates worldwide (< 40%)
- mandatory vaccination in US hospitals: > 98%


Reasons for refusing vaccination against influenza among HCWs in Greece

Not at risk from contracting influenza 43.2%
Fear of vaccine adverse events 33.4%
Believes the vaccine is not effective 19.2%
Ignorance of recommendations for HCWs vaccination 3.8%

* Answers of 2,791 HCWs from 61 public hospitals who refused vaccination


Organization of HCW vaccination campaigns within health-care facilities

Begin as soon as possible
Should target all personnel
(temporary, students, volunteers, all swifts)
Priority:
- HCWs in high-risk departments
- HCWs in direct contact with patients
Provide several opportunities for vaccination


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The need to protect the patients and ensure a safe health-care environment constitutes the basis for the clinical practice since the era of Hippocrates.

Thank you for your attention!

Helena Maltezou

COMING SOON...

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<td>Prof. Andreas Voss, Nijmegen University Medical Center, Netherlands</td>
<td>World Health Organization First Global Patient Safety Challenge: Clean Care is Safer Care (<a href="http://www.who.int/gpsc">www.who.int/gpsc</a>)</td>
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<td>03 November</td>
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