Public Health Aspect
of
Influenza and Influenza vaccine

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18 October 2003
Outline

- Introduction on influenza
- Public health control measures
- Influenza vaccination programme by Department of Health
Influenza Virus

- 3 types: A, B and C
- Type A: associated with widespread epidemics and pandemics
- Type B: infrequently associated with regional or widespread epidemics
- Type C: associated with sporadic cases and minor localized outbreaks
Influenza A subtypes

- 15 haemagglutinin and 9 neuraminidase subtypes
- Subtypes of type A that are important for humans: H3N2, H1N1 and H2N2
Antigenic shift and drift

- Antigenic shift
  - Completely new HA subtype
  - Only with influenza A
  - Associated with pandemics

- Antigenic drift
  - Relatively minor subtype changes
  - Influenza A and B
  - Epidemics and regional outbreaks
Influenza pandemic

- Spanish flu A(H1N1) (1918)
- Asian flu A(H2N2) (1957)
- Hong Kong flu A(H3N2) (1968)
- Russian flu A(H1N1) (1977)
The “bird flu” in 1997

- Influenza A (H5N1)
- 18 cases
  - Age 1-60
  - 50% age ≤ 12
  - M:F=8:10
- 6 deaths
- Mode of transmission was from bird to human, man to man transmission inefficient
A(H9N2) – 2 human cases

- April 1999
- 2 girls aged 4 years and 13 months
- Mild illness, recovered
- A(H9N2) from nasopharyngeal aspirate
- Mode of transmission was from bird to human, man to man transmission inefficient
**Mode of transmission**
- Airborne spread
- Direct contact with respiratory secretion

**Incubation period**
- Ranges from 1-5 days, average 2 days

**Seasonal pattern**
- Cause disease throughout the year, with peak in Jan-March and July-August
**Age group**

- Occurs in all age groups, highest rate in children aged 5-9

**Clinical features**

- High fever, non-productive cough, sore throat, rhinitis, myalgia, headache and malaise
- Very young, elderly and people with medical conditions, e.g. lung diseases, heart problems, diabetes, cancer or kidney are more prone to complications of underlying diseases, pneumonia and death
Public Health Control Measures

- Influenza surveillance
- Risk communication and public education
- Control of institutional outbreaks
- Influenza vaccination
Influenza surveillance

- Sentinel surveillance
- Laboratory surveillance
- Outbreak reporting
- Clinical surveillance
- Other surveillance systems e.g. animals
**Sentinel surveillance**

- Influenza surveillance programme was first introduced in 1960s involving GVU and later 11 GOPC
- Private practitioners have been involved in the sentinel surveillance since 1997
- Network now consists of some 50 private practitioners and 64 GOPC
Influenza-like Illness Surveillance Among General Practitioners 2001 - 2003
Influenza-like Illness Surveillance Among General Out-patient Clinics 2001 - 2003
Laboratory surveillance

- Public Health Laboratory Centre of DH
  - WHO collaborating centre for influenza
  - Performs isolation and typing of influenza virus on samples collected from the sentinel surveillance clinics, public hospitals, private hospitals and laboratories.
  - Data contribute to formulation of WHO recommended vaccine composition.
Outbreak reporting

- Reporting of influenza-like illness outbreaks by institutions e.g. elderly homes, schools
Number of Outbreaks and Persons Affected of Influenza-like Illness, January - August 2003

No. of outbreaks

No. of persons affected

Month

No. of cases

No. of persons affected
ILI outbreak notification from Jan-Aug 2003
(Number of persons affected)
Clinical Surveillance

- Weekly hospital discharges with a diagnosis of influenza

Source: Hospital Authority
Public education

- Adopt a healthy lifestyle
- Adhere to good personal and environmental hygiene
  - Build up good body immunity by having a proper diet, regular exercise and adequate rest, reducing stress and avoiding smoking
  - Maintain good personal hygiene, and wash hands after sneezing, coughing or cleaning the nose
  - Maintain good ventilation
  - Avoid visiting crowded places with poor ventilation
  - Wear a mask if having symptoms of respiratory infections
Control of institutional outbreaks

- Case ascertainment
- Inspection of personal and environmental hygiene
- Health advice on ventilation, hygiene, cohorting and infection control
- Chemoprophylaxis
- Vaccination
- Medical surveillance
Influenza vaccination
Types of influenza vaccine

- Inactivated influenza vaccine
  - Contains noninfectious killed virus

- Live, attenuated influenza vaccine
  - Contains attenuated viruses that are capable of replication

- Viruses for both vaccines are grown in eggs
- Both vaccines are administered annually
Inactivated influenza vaccine

- Vaccine composition recommended by WHO in February and September each year for Northern and Southern Hemispheres respectively.
- Based on surveillance data from worldwide network of national influenza centres and WHO collaborating centres.
- For 2003/04, vaccine strains are A/New Caledonia / 20 / 99 (H1N1)-like, A/Moscow/10/99 (H3N2)-like, and B/Hong Kong/330/2001-like antigens.
Effectiveness of influenza vaccine

- Depends on
  - The age of the vaccinee
  - The immunocompetence of the vaccinee
  - The degree of similarity between the viruses in the vaccine and those circulating in the community
Effectiveness of influenza vaccine

- Overseas studies
- For adults aged <65
  - Influenza vaccine can prevent influenza in 70-90% of healthy adults.
- For children
  - Efficacy of 56% among healthy children aged 3-9
Effectiveness of influenza vaccine

- For the elderly
  - Non-institutionalized: 30-70% effective in preventing hospitalization
  - Institutionalized
    - 30-40% effective in preventing illness
    - 50-60% effective in preventing hospitalization or pneumonia
    - 80% effective in preventing death
Contraindications

- Anaphylactic hypersensitivity to eggs or other components of the vaccine
- Persons with acute febrile illness should not be vaccinated until their symptoms have abated.
Adverse reactions

◆ Local reactions
  - Soreness at the vaccination site that lasts < 2 days

◆ Systemic reactions
  - Fever, malaise, and other systemic symptoms
  - Begin 6-12 hours after vaccination and persist for 1-2 days

◆ Allergic reaction
  - Hives, angioedema, allergic asthma and systemic anaphylaxis
  - Rarely occurs

◆ Guillain-Barre Syndrome
  - Risk: 1 in 1 000 000
Influenza Vaccination Programme
by DH
In line with the advice of the Advisory Committee of Immunization, DH has been implementing vaccination programme for the elderly in residential care homes since 1998.

In 2002,

- 49150 elderly home residents vaccinated
- Coverage rate 88%
Advisory Committee on Immunization (2003)

- Recommends DH’s influenza vaccination programme in 2003 to be extended to cover long-stay residents of residential institutions for the mentally or physically disabled.
Advisory Committee on Immunization (2003)

- Recommends staff of these residential care institutions to receive vaccination.
- Recommends elderly persons (≥ 65 years) and persons with chronic heart or lung diseases to seek advice from their doctors to receive influenza vaccination.
Advisory Committee on Immunization (2003)

◆ Aims:

- To reduce the chance of confusion as suspected cases of SARS
- To reduce the chance of influenza outbreak in institutions and risk of complications among their residents.
DH Influenza Vaccination Programme (2003)

- Elderly home residents
  - Starts from 10 to 29 November 2003
  - Subvented homes, non-profit making self-financing homes, private homes, and sheltered homes for the elderly
  - Includes about 59000 elderly
DH Influenza Vaccination Programme (2003)

- Long-stay residents of residential institutions for the mentally or physically disabled
  - Starts from 10 to 29 November 2003
  - About 10000 disabled persons
DH Influenza Vaccination Programme (2003)

- DH health care workers
- About 5000 staff
- In progress
DH Influenza Vaccination Programme (2003)

- CSSA recipients or medical waivers granted by Hospital Authority (HA) or Social Welfare Department, age $\geq 65$ and chronic heart or lung diseases
  - Starts from 10 November 2003
  - GOPCs under HA and Elderly Health Centres under DH
END