Influenza in the elderly

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Outline
• The virus
• Clinical presentation
• Burden of illness
• Influenza in the elderly
• Challenges & controversies

The virus
• Influenza types responsible for human disease: A, B, C
• Subtypes defined by surface proteins: neuraminidase, haemagglutinin
  • examples: A(H1N1), A(H2N2)
• Changes in virus determine disease patterns:
  • antigenic shift → epidemic, pandemic
  • antigenic drift → seasonal
• Influenza season
  • May-Oct

The virus: transmission
• Reservoirs & intermediate hosts
  • birds (influenza A), pigs, horses, other animals
  • genetic re-assortment, new strains
• Human transmission of influenza:
  • aerosol, droplet (coughing, sneezing)
  • contaminated surfaces
• Infectious period
  • contagious up to 24 hours before symptom onset
  • adults infectious during first 3-5 days of illness

Clinical presentation
• fever/chills
• cough
• sore throat
• rhinorrhea or stuffy nose
• myalgia
• headache
• fatigue

• Host variability:
  • children – vomiting, diarrhoea
  • elderly – confusion, shortness of breath, worsening of a chronic condition

Influenza vs. common cold

Duration of symptoms
• typically 1-2 weeks for influenza; a few days for a cold
• fever
  • often high fever with influenza; infrequent/mild with a cold
Myalgia & shivering
• common with influenza; rare with a cold

May take several weeks to fully recover from influenza, some develop serious consequences including hospitalisation and death.
Complications

- High-risk populations:
  - young children
  - adults > 65 years*
  - pregnant women
  - people with chronic medical conditions
  - Sinus and ear infections
  - Pneumonia (+/- co-infection)
  - Myocarditis, encephalitis, myositis, rhabdomyolysis
  - Sepsis and multi-organ failure

The 2017 influenza season

- Influenza A(H3N2) accounted for ~55% of nationally notified laboratory-confirmed cases
- Deaths reported to the NNDSS largely in the elderly, consistent with predominance of influenza A(H3N2).
  - Median age of deaths was 86 years (range: 3-107 years)
  - >90% of deaths in people aged 65 years and older.

Burden of illness

- Estimated national annual burden (FluCan):
  - 15,000 hospital admissions
  - approx. 100,000 bed-days
- Complications
- Mortality
- Absenteeism & productivity

‘Immunosenescence’

- Increased age associated with decline in the normal function of the immune system - cellular and humoral immunity.
  - Increased risk of influenza infection
  - Decreased responsiveness to influenza vaccination

Vaccine effectiveness

- Reduced vaccine effectiveness in those aged >65 years
- Protection significantly reduced in older adults compared with young, healthy adults

More effective vaccines?

- High dose and adjuvanted influenza vaccines approved and available for Australians >65 years (2018).
  - Trivalent vaccines
    - ~25% increased effectiveness estimated
    - increased injection-site reactions
Prevention & control in the elderly

Community-dwelling
• vaccination
• antiviral agents
  • Treatment
    (within 48 hrs of symptom onset)
  • chemoprophylaxis

Aged care homes
• policy & education
• case isolation, outbreak management
• vaccination: staff & residents
  • antiviral agents
  • treatment
  • chemoprophylaxis

Influenza in aged care settings
• Influenza-like illness attack rate of 5%–20% among aged care home and assisted living residents is typical in non-epidemic years
• Vaccine responsiveness (protective titre)
  • residents of long-term care facilities: <50%
  • young healthy adults: 70–90%
• In those who receive vaccine, influenza illness may be less severe, with a reduced risk of complications, hospitalization, and death.

Prophylaxis in aged care homes
• Chemoprophylaxis is effective but expensive and generally should be reserved for use in the context of imminent influenza exposure

UK experience (2010-13)
• 21/35 (60%) influenza outbreaks ceased once oseltamivir commenced.
• Overall costs of oseltamivir prophylaxis were £84,276 per aged care home (drug costs £55,476, staff costs £28,800).

Staff vaccination in aged care homes
• Risk of staff exposure in aged-care settings not well-understood
• In epidemic setting, US healthcare workers estimated to have 5.8 exposures/year
• Staff vaccination associated with >40% mortality reduction in elderly residents of long-term care facilities
• Vaccination may reduce reported days of work absent
• Voluntary vs. mandatory programs

Challenges
• Immunosenescence & vaccine effectiveness
  • Newer vaccines: high dose & adjuvant-containing
• Prophylaxis in outbreak management
• Optimal timing of vaccination
• Effective strategies for staff vaccination in aged care homes
• Case detection and isolation in aged care settings

Conclusions
• The elderly are at high-risk for influenza infection & complications
• Vaccination is single most effective strategy for prevention
• In aged care homes, influenza vaccination of residents & staff improves outcomes
• Newer trivalent vaccines available to enhance effectiveness (2018)
Questions?

INFLUENZA

United States Public Health Service, issued October 1918