Paediatric Influenza Immunisation: The 2008 metropolitan trial

Scope of the Problem

The impact of influenza epidemics on society and individuals is significant. Individuals with chronic diseases, such as diabetes, cardiovascular disease or chronic obstructive airways disease, the risk of severe complicated influenza and death is greatly increased, irrespective of age. These individuals have an approximately 40 times increased risk of death due to influenza. In individuals with combined chronic cardiovascular and pulmonary disease this risk is increased 800-fold. The “Causes of death Australia 2004” document estimates 14,568 deaths in that year in people with chronic conditions where influenza and pneumonia was listed as an associated cause of death.

Influenza is also a contagious illness of huge global importance in children. About 20 per cent of children develop symptomatic influenza A or B each year. In children, influenza causes various respiratory syndromes, including otitis media, croup, bronchiolitis, bronchitis, asthma and pneumonia. Influenza A accounts for between 10 - 20 per cent of all febrile seizure admissions. Data are also emerging that influenza causes high rates of hospitalisation in children without underlying conditions. A recent US study showed that hospitalisation rates for children without high risk conditions were 12 times higher among those younger than 2 years of age than amongst older children and were similar to rates among older children with high risk medical conditions. Similar high admission rates were seen in a Hong Kong study.

Influenza and WA Health

In Western Australia (WA) there was a total of 949 laboratory-confirmed influenza notifications to the Communicable Disease Control Directorate (CDCD) in 2007, 4.7 times higher than in 2006, with an average rate of 46 cases per 100,000 population. The highest notification rates were seen in the 0 - 4 years age group (Figure 1 next page) with 169.5 cases per 100,000 population, well above the notification rates for any other age group.

In early 2007, WA introduced the Emergency Department Sentinel Surveillance (EDSS) system to monitor the number of possible influenza-attributable presentations at nine metropolitan Emergency Departments. Analysis of these data found that those less than 4-years of age had the highest respiratory viral presentation rate per 100,000 population per week (Figure 2 next page), 12.5 times higher than the next highest age group (5 - 19 year olds). Specific rates were highest in those infants less than one year of age.

- All children in the metropolitan area aged 6 months to 5 years will be offered free influenza vaccine this year
- A case-control study to look at vaccine efficacy will be conducted in Perth in conjunction with the availability of free vaccine
- All GPs are encouraged to take respiratory specimens from target age children who present with flu-like illness
- High vaccination uptake will protect the community
Please Note: Errata and Clarification on Yellow Fever Vaccination

The article on the changes to Yellow Fever Vaccination certificates (Vol. 11 No. 6, Nov 2007) has caused some confusion with the following passage: “It can be noted that in some cases, the vaccine was given to the very elderly against recommendations (the vaccine is supposed to be given to those aged between 15 and 59 years old)”. This statement is from an article on deaths in Peru from yellow fever vaccination and is not recommended practice in Australia. The Immunisation Handbook 8th Ed states that yellow fever vaccination should not be given to patients less than 9 months of age and that Adults aged 65 and over are at increased risk of rare but severe systemic adverse events compared with other age groups.
Population Wide Benefits of Influenza Immunisation in Children

Estimates of influenza-associated mortality rates in children range from 0.2 to 0.8 per 100,000 person-years. In Australia in 2003 and 2004, 5% of deaths officially designated as due to influenza occurred in those aged 0 to 4 years. The annual age-specific death rate among 0 to 4 year olds based on these figures was 0.20/100,000, second only to that in persons over 60 (1.23/100,000), although, deaths officially designated as due to influenza are likely to be underestimates.

In WA in 2007, 10 deaths attributable to influenza were documented among notifications, although this is likely to be an underestimate. Three of these deaths were in children under 4 years of age.

Influenza attack rates during annual epidemics are highest among young children, where infection rates may exceed 30 per cent. Day care attendance and prolonged viral shedding in children also increase the risk for infections and transmission.

Children are known to be efficient spreaders of influenza within the community and several studies suggest that the indirect effects of vaccinating children against influenza are considerable and can create a ‘herd immunity’ that reduces the incidence of influenza in the whole community. In one US study, 85% of children received influenza vaccine well matched with the subsequently circulating influenza A virus strain. The overall rate of influenza-like illness was reduced by one-third compared to the neighbouring town which did not have a vaccination program for children. Another study looked at vaccinating children in day cares and reported a reduction in the incidence of respiratory illnesses in unvaccinated family members. An Italian study demonstrated decreased numbers of respiratory infections and days off work among the household contacts of vaccinated children.

The widespread vaccination of children against influenza is believed to result in decreased mortality in other age groups, especially the elderly population. Japan carried out routine influenza vaccination of school children between 1962 and 1994 and reported this prevented 10,000 - 12,000 deaths each year from pneumonia and influenza and 37,000 - 49,000 deaths each year from all causes. Once the mandatory vaccination of schoolchildren was repealed mortality rates in Japan increased, with no potential confounders to explain the reversal in mortality decline.1

Perth Metropolitan Area Case-Control Study of Influenza Vaccine Effectiveness in Preschool Children

The Australian Technical Advisory Group on Immunisation has recently re-convened the influenza working party to consider current influenza vaccine recommendations, including those for young children. Deciding whether to recommend universal annual influenza vaccination in young children is complicated by the relative paucity of data on the effectiveness of inactivated trivalent vaccines in reducing this burden of disease. Careful evaluation of influenza vaccination programs would provide valuable information regarding vaccine effectiveness in this high risk population and likely impact on disease burden and associated health-care and societal costs. The USA has recommended universal influenza vaccination for all children 6 – 59 months of age since late 2006 although the impact of this recommendation has yet to be evaluated.

Current Australian guidelines are to promote the use of vaccine as beneficial and safe in this age group but not to recommend free universal vaccination as the cost benefit has not been demonstrated. WA is uniquely placed to undertake the studies required to produce this information because of its existing Sentinel Practitioner network (60% of the National system) and its robust emergency department sentinel system. Delivering a case for universal funded paediatric influenza vaccination will have long term benefits for WA residents.

The Communicable Disease Control Directorate (CDCD) in association with the Telethon Institute Vaccine Trials Group (VTG) has negotiated with Sanofi and CSL to provide free influenza vaccination in 2008 to all children aged between 6 months and 5 years in the Perth metropolitan area as a trial to assess efficacy.

1 References available upon request
Children not previously vaccinated for influenza will need 2 doses one month apart. Influenza vaccines will be supplied by children’s usual immunisation providers. It is anticipated that the designated free vaccines will become available in late March.

The case-control study will run throughout the Perth metropolitan area and will test vaccine effectiveness in young children against 3 levels of severity of influenza infection:

1) Influenza infection requiring presentation to the General Practitioner
2) Influenza infection resulting in presentation to a paediatric Emergency Department
3) Influenza infection resulting in hospitalisation

Enhanced surveillance will be conducted during an approximately 4 month period when influenza is circulating within the community. This study will build on existing influenza surveillance systems set up by CDCD in General Practice, Metropolitan Emergency Departments and Public Hospitals, but all metropolitan GPs are requested to ensure children in the target age group with influenza-like symptoms have nasal swabs taken and placed in viral transport media (VTM) for influenza PCR/culture.

Children presenting to the Princess Margaret Hospital Emergency Department with an influenza like-illness will also have nasal swabs taken for influenza detection.

Vaccination status of controls and of cases presenting to the GP, Emergency Department and admitted to hospital will be confirmed from parental hand-held records, Australian Childhood Immunisation Register (if applicable) or General Practitioner records. Relevant demographic details and information on coexistent medical conditions and risk factors for influenza will also be collected from cases and controls.

This is a major study with potential benefits not just for the target age group but also for the whole community. More information will be given to GPs closer to the commencement time. All GPs are urged to support the study in their practice.

**Key Points of Trial**

- All children in the metropolitan area aged 6 months to 5 years will be offered free influenza vaccine this year
- Children not previously vaccinated will need two doses one month apart
- Detailed information on accessing vaccine will be sent to all GPs in the next two months
- A case-control study to examine vaccine efficacy will be conducted in Perth in conjunction with the availability of free vaccine
- All GPs are encouraged to take respiratory specimens from target age children who present with flu-like illness
- Age and sex matched children will be sourced from each practice for comparison when a flu case is identified
- High vaccination uptake will protect the community
- A demonstration of cost effectiveness during the trial will enable a case to be made to add paediatric vaccination to the national immunisation program

---

**Sexual Health Training for GPs**

The Sexual Health and Blood-borne Virus Program has funded the Australasian Chapter of Sexual Health Medicine (ACSHM) to conduct an interactive case-based Sexual Health Workshop for GPs from 4th - 6th April 2008 at the Duxton Hotel, Perth. Topics covered will include herpes, warts, discharges, sexual history taking, counselling techniques and contact tracing. For more information, please contact Suzanne Marks at ACSHM

Tel: 02 9256 9643
Fax: 02 9256 9693
Email: sexualhealthmed@racp.edu.au

---

**Staff Change**

CDCD is delighted to welcome back Dr Gary Dowse to head up the Epidemiology & Surveillance section after 2 years away, mostly as a Station Leader in Antarctica. Dr Dowse, a ten year veteran of the CDCD, was previously an important source of information and advice for primary care physicians around the state and is looking forward to reestablishing these links.