COMMENCING May 2006

Australian Paediatric Surveillance Unit
STUDY PROTOCOL
Varicella complications requiring hospitalization

BACKGROUND

Varicella zoster is a highly contagious and infectious virus causing varicella on primary infection and herpes zoster on subsequent reactivation. Approximately 90% of varicella cases occur in children less than 15 years of age with the highest incidence among children aged 1 to 4 years (1, 2). Although generally a mild disease in previously healthy children, in at least 1% of children under the age of 15 years there are severe complications including secondary bacterial infections, central nervous system manifestations, pneumonitis and death (3). A study by the German Paediatric Surveillance Unit showed that 6.7% of patients have long-term sequelae including persistent neurological deficits (4). Higher rates of complications are reported among children with compromised T cell immunity including children with leukaemia and tissue transplant recipients. Other described risk factors for severe complications include asthma, malnutrition, intense exposure and smoking. Analysis of ICD codes for hospital admissions in Australia for the years 1971 to 1993, show that 37% of all admissions for chicken-pox are for children under the age of 15 years (5). There are no systematic prospectively collected data on the severe complications of varicella in Australia.

From 1 November 2005, a live attenuated vaccine has been made available by the Australian Government Department of Health and Ageing and is recommended for all children born after 1 May 2004 (6). The vaccine is to be administered at age 18 months. A catch-up vaccination is available to a cohort of children aged 10 to 13 who have not been vaccinated previously and who have not had the disease. The vaccine has been shown to prevent varicella in 85% of immunised children, with 97% protection against moderately severe and severe disease (7).

Little is known about the distribution of VZV genotypes and their virulence in Australia (8). Literature from the UK and the USA suggests that there are two European genotypes, an African/Asian genotype, and a Japanese genotype (9). Immunity to one genotype was thought to be completely cross protective, against recurrent clinical varicella infection. However, a recent study found that up to 13% of children with varicella had a previously well-documented history of varicella illness suggesting that second attacks are more common than previously thought (10).

We propose to genotype viruses from children who develop severe or complicated varicella infection to distinguish vaccine complications from wild virus infection and to identify the genotypes of VZV that cause severe complications of varicella in Australia. This information may have an impact on the future development of varicella vaccines.

STUDY OBJECTIVES

1. To document the incidence of severe complications of varicella infection in hospitalised children aged between 1 month and 15 years.
2. To describe the demographics of affected children: age group, birth order, ethnicity, geographical distribution
3. To document vaccination status and any underlying conditions
4. To describe the management of the disease, complications and short term outcomes
5. To describe the genotype(s) of varicella zoster viruses that are associated with severe complications of varicella infection in Australia

CASE DEFINITION AND REPORTING INSTRUCTIONS

Report any child aged 1month or more, up to 15 years, hospitalised with varicella **and** complicated by one or more of the following:

- Bacteraemia / septic shock
- Toxic shock syndrome/ toxin mediated disease
- Septic arthritis or other focal purulent collection
- Necrotising fasciitis
- Encephalitis
- Purpura fulminans/disseminated coagulopathy
- X-Ray evidence of pneumonia
- Fulminant varicella (multi-organ involvement)
- Reye's syndrome
- Ataxia

Virological testing
In order to confirm varicella we recommend collection of a sample of vesicle fluid. Please Collect the sample and send to your local laboratory for culture or PCR or IF **as per usual practice**. The investigators will liaise with your virology laboratory regarding transporting the samples for genotyping.

INVESTIGATORS (indicate principal investigator by asterisk)

*Professor Robert Booy Director, NCIRS The Children's Hospital at Westmead Locked Bag 4001 Westmead NSW 2145	Dr David Burgner University Department of Paediatrics Princess Margaret Hospital GPO Box D184 PERTH WA 6840
Dr Michael Nissen Department of Paediatrics and Child Health University of Queensland Royal Children's Hospital HERSTON QLD 4029	Dr Jim Buttery Department of Infectious Diseases Royal Childen's Hospital Flemington Rd PARKVILLE VIC 3052
Dr Yvonne Zurynski Assistant Director Australian Paediatric Surveillance Unit The Children's Hospital at Westmead, Westmead NSW 2145	Professor Elizabeth Elliott Director, Australian Paediatric Surveillance Unit The Children's Hospital at Westmead, Westmead NSW 2145
Dr Michael Gold Department of Paediatrics, Women's and Children's Hospital, North Adelaide, SA and Senior Lecturer, Department of Paediatrics, University of Adelaide	Dr Elizabeth Peadon Australian Paediatric Surveillance Unit The Children's Hospital at Westmead, Westmead NSW 2145

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