The Measles Control Campaign and immunisation adverse events

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The Measles Control Campaign

The Commonwealth Department of Health and Family Services has announced that the 'Measles Control Campaign' will be launched on 9 July 1998. Between August and November 1998, in a school-based program, all children in primary schools throughout Australia will be offered an additional dose of measles-mumps-rubella (MMR) vaccine, irrespective of their prior vaccination history. Parents of preschool-aged children who do not have a MMR vaccination recorded on the Australian Childhood Immunisation Register (ACIR) will receive a letter from the Register urging them to have their child vaccinated, and parents of high school students will be similarly advised to ensure that their children have had at least two doses of MMR.

The primary school program is expected to reach more than 90% of the almost 2 million Australian children aged 5 to 12 years, in a period of less than 6 months. It can be predicted to result in an increased number of reports of suspected adverse reactions to the vaccine. Systems are currently being coordinated between the Commonwealth and State and Territory Health Departments to keep a careful tally of these reports and to make sure that they are appropriately followed up. This is necessary to keep the community fully informed, and to make sure that it is clear that this short-term increase in side effects is outweighed by improved disease control.

Adverse events associated with MMR vaccination

Published studies mostly relate to vaccination of young children or adults with no prior immunity. In the Australian re-vaccination program the rates will be lower, as the majority of school children will be immune to one or more of the vaccine components.

The incidence of reactions following primary MMR vaccination of preschool-aged children has been documented in a randomised controlled trial; reactions likely to be attributable to the vaccine included rash (2%), fever (6%), conjunctivitis (2%) and drowsiness or irritability (2-4%).[1] The risk of a febrile convulsion following vaccination in this age group is 1 in 3,000.[2] The United States Institute of Medicine carefully reviewed data on serious adverse events related to measles and rubella vaccines and concluded that anaphylaxis occurred rarely (there were only two well documented cases in the literature), thrombocytopenia occurred at a rate of 1 in 30,000 to 1 in 40,000, and that death could be caused by measles vaccine virus in immunocompromised children.[3-5] The Institute of Medicine's review also confirmed that rubella vaccine could cause acute arthritis or arthropathy in post-pubertal women (13-15%), but vaccine-associated arthropathy is mostly transient and natural rubella has a much higher rate of this complication (52%).[6-9]

Although the Institute of Medicine reported that the data were inadequate for accepting or rejecting an association between measles vaccine and encephalitis or encephalopathy,[3] a recent report continues to suggest a rare association.[10] It is estimated that encephalitis may occur in 1 in 1 million recipients of measles vaccine and 1 in 3 million recipients of the mumps vaccine strain (Jeryl-Lynn) available in Australia.[11]

Adverse events not associated with MMR vaccine

There are adequate data to refute the recent suggestions that MMR vaccine is associated with autism, inflammatory bowel disease and asthma.[12,13]

Contraindications and false contraindications to MMR vaccine

Asthma, allergy to egg, and mild intercurrent illness are not contraindications to MMR vaccine.[11,14]

Children who have had a previous serious allergic reaction to the vaccine should be referred for advice about risks of further vaccination. Children who are immunosuppressed due to medication or underlying disease (except asymptomatic HIV infection) should *not* be vaccinated.[11]

Experience in the United Kingdom

In England, commencing in November 1994, over 7 million school children aged 5 to 16 years received an additional dose of measles-rubella vaccine, in a program similar to, but shorter (4 to 6 weeks) than, the Australian one.[15-17]

Before the program commenced, doctors were reminded about the importance of reporting all suspected adverse reactions immediately to the Medicines Control Agency (MCA) which is similar to the Australian Drug Reaction Advisory Committee. During the program, data collected by the MCA were reviewed daily by a medical assessor and electronically transmitted to the vaccination teams. This ensured that the adverse events were under continuous review and long-term follow-up was conducted.

A total of 2,735 adverse reactions were reported in 1,202 children by the end of October 1995; a reporting rate of one affected child for approximately 6,700 immunisations. Most reports related to minor reactions, many of which were unlikely to have been due to the immunisation. There were no deaths. Serious reactions could be classified into two groups; those occurring around the time of the immunisation and those occurring later.

Early onset reactions

Symptoms and signs of anaphylaxis or allergic reactions (for example, bronchospasm) within 24 hours of vaccination were reported in 1 in 65,000 (123 reports). Fifty-two per cent of these children received adrenaline

and some were admitted briefly to hospital, but there were no serious sequelae.

There was also a small group of children who had syncopal episodes which precipitated brief convulsions at the time of, or shortly after, immunisation. This is a common occurrence in mass vaccination programs; nurses are familiar with its management and the children recover promptly and completely. Canadian workers have found that in school-based programs fainting accompanied by pallor is sometimes mistaken for anaphylaxis and is therefore likely to be over-reported.[18]

Neurological reactions

There were 91 reports of neurological reactions including 61 convulsions (37 of which are mentioned above). Reported rates of encephalitis or encephalopathy (11 cases), Guillain-Barre syndrome (3 cases) and meningitis (2 cases) were no higher than the background rates of those conditions. For example, epidemiological data suggest that 1 to 7 cases of Guillain-Barre syndrome would be expected in the United Kingdom over a 4-week period in this age group in the absence of an immunisation program. Attending medical officers were asked for details of serological and cerebrospinal fluid (CSF) findings in these cases, but these were not always available. Only one of the 11 children with encephalitis or encephalopathy failed to recover completely. This boy had a slight residual hemiparesis and his serology confirmed that he had been immune to measles prior to the vaccination.

Arthropathy and other reactions

There were six reports of arthritis, but only one with onset within 14-21 days after vaccination, the usual time of onset of rubella vaccine provoked arthritis. In addition, there were 41 reports of arthropathy; most were unlikely to have been caused by the vaccine because the time of onset was not within 14-21 days from vaccination. Other suspected reactions reported included erythema multiforme (9), herpes zoster (7), Henoch-Schönlein purpura (5) and thrombocytopenia (2). Of these, only erythema multiforme and thrombocytopenia were biologically plausible associations.

Implications for the Australian Measles Control Campaign

Experience in the United Kingdom has shown that, with appropriate systems for vaccination and surveillance in place, a large school-based campaign can be carried out effectively and without incident. The medical profession, the media and the community need to be fully informed about every detail, including the fact that the vaccine is *not* prepared in fetal cells (it is prepared in a continuous cell line which in 1961 originated from fetal fibroblasts).

The importance of the program is in preventing the outbreak of measles predicted to occur in the next year or two, and its associated deaths and disability. This has to be balanced against an expected temporary increase in reports of adverse events following vaccination.

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Editorial note

Reporting on adverse events following immunisation for the national Measles Control Campaign

For the period of the national Measles Control Campaign, the following reporting mechanisms for Adverse Events Following Immunisation (AEFI) will be in place:

- Immediate AEFI will be reported by the teams of nurses conducting the school-based vaccination clinics on a daily basis to the State and Territory Measles Coordinators.
- General Practitioners will be asked to report all AEFI by phone to the State and Territory Measles Coordinators. A description of conditions to be reported will be

provided to all GP's prior to the commencement of the campaign.

- All serious AEFI will be notified by State and Territory Measles Coordinators to the National Manager, Measles Control Campaign by phone and a written report provided as soon as possible after the event.
- Reports of AEFI will be forwarded to the national surveillance scheme (Serious Adverse Events Following Vaccination Surveillance Scheme) and the Australian Drug Reaction Advisory Committee (ADRAC).

Follow-up of AEFI will be undertaken by States and Territories according to normal procedures.

The NCIRS was established by the National Centre for Disease Control, Commonwealth Department of Health and Family Services. The Centre analyses, interprets, and evaluates national surveillance data on immunisation coverage and vaccine preventable diseases. NCIRS also identifies research priorities, and initiates and coordinates research on immunisation issues and the epidemiology of vaccine preventable diseases in Australia.