Mass psychogenic response to human papillomavirus vaccination

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Cervical cancer associated with human papillomavirus (HPV) affects approximately 1000 Australian women each year, causing about 300 deaths.[1] The newly licensed HPV vaccines Gardasil (CSL Limited), a quadrivalent vaccine (4vHPV), and Cervarix (GlaxoSmithKline Vaccines), a bivalent vaccine (2vHPV), induce protection against the two most common strains of HPV, which cause 70% of all cervical cancers.[2,3]

The quadrivalent HPV vaccine was included in the government-funded National Immunisation Program from April 2007 for females aged 12–26 years. The initial phase targeted secondary schools, vaccinating girls aged 12–17 years in Years 7, 10, 11 and 12. This program was conducted by local government vaccination teams in Victoria.

The reactogenicity of 4vHPV reported in clinical trials was acceptable, with serious adverse events following immunisation (AEFI) reported in less than 0.1% of vaccine recipients.[4] In Australia, AEFI are reported to the Adverse Drug Reactions Unit (ADRU) of the Therapeutic Goods Administration, either directly or via state authorities. In Victoria, to enhance AEFI surveillance and clinical support, the state government funded a new service, SAEFVIC (Surveillance of Adverse Events following Vaccination in the Community) in April 2007.

Details of a mass psychogenic event

On 7 May 2007, 720 girls aged 12–17 years received 4vHPV at a girls school in metropolitan Melbourne. Within 2 hours of vaccination, 26 girls presented to the school's sick bay with symptoms including dizziness, syncope and neurological complaints. Four were transported by ambulance to a nearby paediatric hospital with a range of symptoms, including palpitations (1), dizziness (4), syncope or collapse (3), weakness (3) and aphasia (1).

Further history-taking and examination, including specialist paediatric neurological review, found no organic basis for the reported symptoms. The results of all investigations, including neuroimaging and electroencephalography in one patient and electrocardiography in another, were normal. Two patients recovered spontaneously and were discharged from the emergency department, while the other two were observed overnight and discharged the following day. One was readmitted 2 days later after a further episode of syncope with subsequent lower limb weakness, but was discharged the following day.

The four girls transported to hospital were reviewed in the SAEFVIC clinic. Three received subsequent doses of 4vHPV under supervision, with no further AEFI. One girl declined further doses.

The Victorian Government asked the ADRU and the National Immunisation Committee if they knew of any similar reports, but no significant 4vHPV-related AEFI were identified. Searches of the United States Vaccine Adverse Event Reporting System and by the vaccine manufacturer failed to identify any similar reactions from pre-licensure trials or post-licensure surveillance.

A review of the school vaccination processes showed that all recommended procedures had been followed: each vaccine was administered to seated children without others watching, there were separate entrances and exits for vaccinees, and a single class queued at any one time. Importantly, the entire school was built around a central quadrangle, with each of the 26 symptomatic girls taken to the sick bay being led through there in view of all classrooms.

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Discussion

Without evidence of an organic aetiology or similar reports of AEFI elsewhere after the initiation of population vaccination with 4vHPV using the same vaccine batch, it is highly likely that this cluster was the result of a psychogenic response to mass vaccination in a school setting. With the implementation of a community-wide immunisation program, mass school programs are highly cost-effective and most effective for maximal coverage. However, similar psychogenic responses are well documented.[5]

Mass psychogenic illness has been defined as "the collective occurrence of a constellation of symptoms suggestive of organic illness but without an identified cause in a group of people with shared beliefs about the cause".[5] Minimising the risk of this phenomenon should routinely be considered when planning mass vaccination campaigns.

All AEFI reported by patients, parents and clinicians must be investigated appropriately. This is especially important for potentially serious events. AEFI may be caused directly or triggered by a vaccine or the process of vaccination, or may have occurred coincidentally. It is important that all such events be responded to in the same manner, regardless of suspected cause. Post-licensure surveillance of AEFI is critical for all vaccines and therapeutic drugs, as pre-licensure trials are not large enough to reliably detect rare adverse events and are conducted in well controlled conditions that are less influenced by the vagaries of community interpretation.

Prompted by a talkback radio telephone call by the mother of one of the four girls taken to hospital, there was considerable media interest in and public anxiety about this series of events, with national and international coverage.[6] The national response included radio interviews with the then federal health minister and the Victorian state premier.[7]

Responses of this type may be expected with the mass introduction of a new vaccine to adolescents in a school setting. The requirement to complete a course of three vaccinations for a large population by the end of the school year limited the time available for education and consultation before commencement of vaccinations.

As for any population-wide strategy of giving injections to healthy individuals, immunisation programs will continue to be challenged by reports of adverse event clusters in the future. The ability to rapidly detect and assess these cases to determine whether they represent real vaccine-associated AEFI or are due to other factors is critical to maintaining long-term community support for vaccination.

Competing interests

GlaxoSmithKline supported Jim Buttery's travel to speak at an international meeting by payment to the Murdoch Childrens Research Institute.

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