Australian Paediatric Surveillance Unit annual report, 2015

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Context

This report provides an update on the surveillance conducted by the Australian Paediatric Surveillance Unit (APSU) during the period January to December 2015.

Introduction

The APSU was established in 1993 to facilitate national active surveillance of uncommon diseases of childhood including selected communicable diseases. This report includes data on the following conditions: acute flaccid paralysis (AFP), a surrogate condition for poliovirus infection; congenital cytomegalovirus; congenital rubella; perinatal exposure to HIV and paediatric HIV infection; neonatal and infant herpes simplex virus (HSV); congenital varicella; neonatal varicella; and juvenile-onset recurrent respiratory papillomatosis (JoRRP). Surveillance of severe complications of influenza was undertaken during the influenza season (1 July to 30 September 2015).

Methods

Australian Paediatric Surveillance Unit

APSU study protocols and case definitions are developed with collaborating study investigators who provide specialised clinical expertise for each condition studied. These conditions are listed in the Table. Each month approximately 1,500 paediatricians and other child health clinicians nationally are sent the APSU report card. Over 90% of clinicians report via email; they respond each month whether or not they have a case to report for any of the conditions listed on the report card.[1] The APSU collects de-identified clinical and/or laboratory data via a case report form completed by the doctor looking after the child. Completed case report forms are then forwarded on to study investigators. All study protocols and case report forms are available for download from the APSU website (www.apsu.org.au). The response rate to the monthly report card was 90% in 2015.

For surveillance of AFP, the APSU collaborates with the Paediatric Active Enhanced Disease Surveillance (PAEDS) system. PAEDS is a hospital-based surveillance system reliant on active case ascertainment by specialist surveillance nurses and operates in 5 tertiary hospitals around Australia.[2] For data on AFP collected through PAEDS please refer to the PAEDS annual report for 2015 published on the *Communicable Diseases Intelligence* website.[3]

All reported rates are based on child population estimates published by the Australian Bureau of Statistics.[4]

Results

Acute flaccid paralysis

Paediatricians are instructed to report all cases of AFP immediately after they are identified to the APSU and the National Polio Reference Laboratory. Data from the APSU are submitted regularly to the Polio Expert Panel. In 2015, there were a total of 25 confirmed cases of AFP notified to the APSU. Of the 25 confirmed cases, 14 were reported from Victoria, 4 from New South Wales, 3 from Tasmania, 3 from Western Australia and 1 from South Australia. All cases were reviewed by the Polio Expert Panel and classified as non-polio AFP. The main diagnoses associated with AFP cases were Guillain-Barré syndrome (40%), transverse myelitis (14%), acute disseminated encephalomyelitis (14%), botulism (8%) and acute axonal neuropathy (8%). APSU contributes to the national AFP surveillance efforts to reach the World Health Organization surveillance target of 1 case per 100,000 children aged less than 15 years per annum.[5]

Congenital cytomegalovirus

In 2015, 18 confirmed cases of congenital cytomegalovirus were reported to the APSU, with 291 confirmed cases reported during the entire study period 1999 to 2015. Of the 18 confirmed cases, 6 were from Queensland, 5 were from New South Wales, 3 from Victoria, 2 from Western Australia and 2 from the Northern Territory. All of the 18 children were born in Australia, none identified as Aboriginal or Torres Strait Islander.

Table: Confirmed cases identified Australian children aged < 16 years in 2015 and for the total study period, and reported rates per 100,000 of the relevant child population, by condition

Condition	Date study commenced	Questionnaire returned (%)	Number of confirmed cases 2015	Reported rate for 2015 (per 100,000)	Number of confirmed cases for total study period	Reported rate for total study period (per 100,000 per annum)
Acute flaccid paralysis	Mar 1995	100	25*	0.56†	892	1.04†
Congenital cytomegalovirus	Jan 1999	81	18	5.93‡	291	6.58‡
Congenital rubella (with defects)	May 1993	100	1	0.02§	54	0.06‖
Perinatal exposure to HIV	May 1993	100	38	12.68‡	664	11.15‡
HIV Infection	May 1993		Nil	Nil	87	0.09§
Neonatal – herpes simplex virus infection	Jan 1997	87	16	5.34‡	180	6.35‡
Infant – herpes simplex virus infection	Jan 2012		3	0.99¶	15	0.98¶
Congenital varicella	May 2006	No notifications	Nil	Nil	2	0.00§
Neonatal varicella	May 2006	100	4	0.09‡	26	0.08‡
Juvenile onset recurrent respiratory papillomatosis (JoRRP)**	Oct 2011	100	1	0.02†	13	0.07†
Severe complications of influenza††	Influenza season each year since 2008	99	84	1.88†	488	1.42†

* Includes all cases of acute flaccid paralysis reported via the Australian Paediatric Surveillance Unit. All cases have been classified by the Polio Expert Panel as 'non-polio acute flaccid paralysis according to World Health Organization criteria. The number of confirmed cases for the total study period includes both the Australian Paediatric Surveillance Unit and Paediatric Active Enhanced Disease Surveillance data.

† Based on population of children aged less than 15 years.

§ Based on number of births.

‖ Based on population of children aged less than 16 years.

¶ Based on population aged less than 12 months.

** Includes both confirmed (visualisation via endoscopy and histology report) and probable cases (visualisation via endoscopy but no histology report).

†† Influenza surveillance was conducted each year since 2008 during the influenza season, 1 July to 30 September except in the pandemic year (2009) when surveillance occurred from 1 June to 31 October.

Congenital rubella

There were 2 notifications of congenital rubella reported to the APSU during 2015. There was 1 confirmed case from Queensland and the other case from South Australia did not meet criteria to be classified as congenital rubella syndrome. This means that there have been 3 cases of congenital rubella detected in the last 3 years including 2 confirmed cases in 2013. All children were born in Australia to mothers who had been born overseas (Thailand and Indonesia); 2 of the mothers reported that they were unvaccinated and 1 did not know her vaccination status. No cases had been reported in the 5 years 2009 to 2014. During the entire study period 1993 to 2015 there have been 59 cases of congenital rubella (54 confirmed and 5 probable) reported to the APSU. It is mainly due to the National Immunisation Program that Australia has seen a reduction in congenital rubella infection. However, reports of imported and locally acquired cases among immigrant unvaccinated women during previous years reinforce the need for continued surveillance and vaccination.[6]

Perinatal exposure to HIV and HIV infection

There were 38 confirmed cases of perinatal exposure to HIV reported to the APSU in 2015, but no cases of HIV infection in children. Of the 38 confirmed cases, 20 were from Victoria, 15 were from New South Wales, 2 from Western Australia and 1 from the Australian Capital Territory. Only 1 child with perinatal exposure to HIV was of Aboriginal or Torres Strait Islander descent.

The majority of mothers of these children were receiving antiretroviral therapy (n=30, 79%). Women most frequently gave birth by vaginal delivery (n=20, 53%) or by elective caesarean section (n=10, 26%) and 3 had an emergency caesarean section. Most mothers (n=32, 84%) reported avoiding breastfeeding their children.

Neonatal and infant herpes simplex virus

Of 26 notifications, there were 19 confirmed cases of neonatal or infant HSV reported to the APSU in 2015. There were 16 neonatal cases aged less than 1 month, and 3 were infant onset cases aged between 1 month and 1 year. Of the 16 neonatal cases, 5 were reported from New South Wales, 4 from Victoria, 2 from Western Australia, 2 from Australian Capital Territory, 2 from Queensland and 1 from South Australia.

Eleven cases had HSV-1 and 5 had HSV-2. Seven cases had skin, eye, mouth (SEM) disease, 6 had HSV central nervous system disease and 3 had disseminated disease. Of the 3 infant onset cases, 2 were reported from New South Wales and 1 from Victoria. All 3 cases had HSV-1 and all 3 had SEM disease. There were 3 deaths in 2015 and all 3 were neonatal cases. One of these had SEM disease but died from causes other than HSV, 1 had HSV encephalitis and 1 had disseminated HSV with central nervous system symptoms.

Congenital and neonatal varicella

There were no cases of congenital varicella reported during 2015. The last case of congenital varicella reported to the APSU was in 2007. Four cases of neonatal varicella were reported to the APSU in 2015. Of these, 2 were from Queensland, 1 from New South Wales and 1 from Western Australia. All 4 infants were exposed to varicella after birth, however the details of the infective contacts were not known. All infants required hospitalisation due to varicella infection (length of stay 3–10 days), and all were treated with Aciclovir.

Juvenile onset recurrent respiratory papillomatosis

There was 1 confirmed case of JoRRP in 2015. The case from New South Wales was confirmed by visualisation of lesions on endoscopy and histology results. The child was Caucasian and 9 months of age. During the total study period (2011–2015) there have been 18 notifications, with detailed clinical data available for 17 (94%) cases. Of the 17 completed case reports there were 3 duplicate reports and 1 error. Of the remaining 13 notifications there were 10 confirmed and 3 probable cases: 6 confirmed and 1 probable case in 2012; 2 confirmed and 1 probable in 2013; and 1 confirmed and 1 probable case in 2014. These data suggest a declining trend in JoRRP since surveillance commenced in 2011. This may be a result of the successful HPV Vaccination Program introduced to Australia in 2007.

Severe complications of influenza

A total of 84 children admitted to hospital with serious complications of influenza were reported to the APSU from 1 July to 30 September 2015. Of the 84 children, 41 were from Queensland, 16 from New South Wales, 14 from South Australia, 8 from Victoria, 3 from Tasmania and 2 from Western Australia. None of the children were Aboriginal or Torres Strait Islander.

There has been an increase in the number of notifications reported to the APSU compared to previous years (n=22 in 2013 and n=87 in 2014). However, this increase could be due to the introduction of online reporting of cases. The most commonly reported strain in 2015 was Influenza B (n=59).

Twenty-five children had Influenza A. Serious complications included pneumonia (n=41), seizures (n=24) and encephalitis (n=11).

In 2015, 28 (33%) children required an intensive care unit admission and 3 (4%) children died. Of the 84 children, 53 were previously healthy, while 30 had chronic predisposing conditions including asthma, cerebral palsy, chronic lung disease, and congenital heart disease.

Only 4 of the 84 children were vaccinated for influenza within the last 12 months and all of them had chronic predisposing conditions. Children with chronic predisposing conditions are recommended and funded for annual influenza vaccination under the National Immunisation Program, however only 4 (13%) of the 30 of eligible children were vaccinated.

Conclusions and future directions

For over 20 years the APSU has been facilitating the active surveillance of uncommon rare childhood diseases, complications of common diseases or adverse effects of treatment. This year the APSU introduced surveillance of microcephaly in children less than 12 months of age. Microcephaly is defined as an occipito-frontal head circumference more than 2 standard deviations below the mean for age, gender and gestation. This rare condition is often associated with symptoms of neurological impairment including seizures and may also be associated with developmental delay, intellectual impairment, problems with vision, hearing and feeding. There are many causes of microcephaly, including congenital infections such as cytomegalovirus, rubella and rarely, herpes simplex virus, syphilis and varicella zoster virus, and very rarely, HIV. Microcephaly is of current interest due to the proven relationship between maternal Zika virus infection during pregnancy. For more information on current APSU surveillance of microcephaly please visit the APSU website (www.apsu.org.au).

The APSU continues to lead the way in rare disease research and provides valuable data on clinical, treatment and outcome data on infectious and vaccine preventable conditions in Australian children. The data collected through the APSU contribute significantly to the national surveillance effort, providing valuable information for clinicians, policy makers and the community.

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