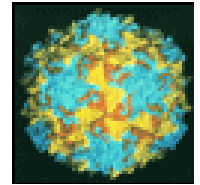


Polio Update

Newsletter of the Australian National Poliovirus Reference Laboratory
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Issue 1

March 2006

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Major Points

- **IPV replaced OPV in Australia's immunisation program from 1st November 2005**
- **Isolation of Sabin poliovirus strains is expected to cease in Australia by mid-2006**
- **Vaccine derived poliovirus (VDPV), a mutated form of OPV, was isolated from four people (without paralysis) in the USA, in August 2005. The USA has not used OPV since 2000.**
- **In March 2005, an unimmunised 22 yr old woman from the USA developed vaccine associated paralytic poliomyelitis (VAPP) while on student exchange in a country that immunises with OPV**

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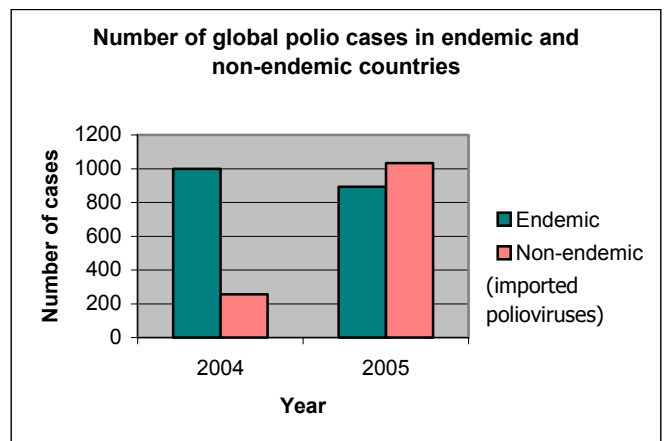
Australia switched from OPV to IPV on November 1st 2005

- ♦ The Salk inactivated polio vaccine (IPV) replaced the Sabin oral polio vaccine (OPV) in Australia's National Immunisation Program, from 1st November 2005. The switch to the exclusive use of IPV eliminates the risk of vaccine associated paralytic poliomyelitis (VAPP), a rare adverse reaction from OPV. Australia's last documented case of VAPP occurred in 1994 (Sullivan *et al* Med J Aust 1995: 163;423).
- ♦ Consequences for Australian virology laboratories:
 - ♦ Isolation of Sabin polioviruses from clinical specimens is expected to decrease to zero by mid-2006.
 - ♦ Any polioviruses isolated after mid-2006 are potentially an importation.
 - ♦ All poliovirus isolates, irrespective of their origin, should be referred to the National Poliovirus Reference Laboratory (NPRL) for full investigation.

Dramatic increase in polio cases due to imported wild poliovirus in 2005

- ♦ Wild polioviruses were isolated in 16 countries, in 2005.
- ♦ Six countries were classified as endemic for wild poliovirus: Afghanistan, Egypt, India, Niger, Nigeria, Pakistan.
- ♦ The number of global polio cases in 2005 was 1,926
- ♦ 303 polio cases occurred in Indonesia, due to wild poliovirus that originated in Nigeria.
- ♦ The number of polio cases in non-endemic countries increased from 256 in 2004 to 1,034 in 2005 (Refer to Figure).

Background to polio eradication program can be found on page 2



Faecal collection for AFP surveillance still remains a challenge for Australia

- ♦ Please contact the NPRL if you have a case of AFP, GBS, transverse myelitis, infant botulism or any other case reported with paralysis in a child under fifteen years of age to arrange shipment of faecal specimens.
- ♦ Ideally we require for each case of AFP, 2 faecal specimens collected 24 hrs apart, within 14 days of onset of paralysis from all AFP cases.
- ♦ Shipping costs will be covered by the NPRL.
- ♦ Australia is expected to have 40 cases of AFP annually in children less than 15 yrs of age, based on WHO criteria.
- ♦ WHO target rate is 80% of notified cases with adequate faecal collection. The collection rate for faecal specimens in 2005 was 19 % with our highest rate recorded in 2004 at 37%.

World Health Organization Polio Eradication Program

Background

- ◆ In 1988, the member states of the World Health Assembly voted for the global eradication of poliomyelitis by the year 2000
- ◆ In 1988, wild poliovirus was endemic in more than 125 countries world-wide and more than 350,000 cases of polio were reported
- ◆ At the end of 2005, 1,926 cases of polio were reported and polio was endemic in Nigeria, India, Pakistan, Niger, Afghanistan and Egypt
- ◆ Australia's last case of poliomyelitis due to indigenous wild poliovirus was in the 1970's

Poliovirus

- ◆ Poliomyelitis (polio) is a highly infectious disease caused by the poliovirus
- ◆ Poliovirus is:
 - a member of the Picornaviridae family and enterovirus genus
 - a single stranded, positive-sense RNA virus, with three distinct serotypes: PV1, PV2 and PV3
 - spread mainly by faecal-oral transmission
- ◆ The virus replicates in the pharynx and in the intestine
- ◆ Excretion of the virus lasts between two to six weeks but may persist for up to 19 weeks
- ◆ Most infections (>90%) are asymptomatic
- ◆ In less than 1% of infections, poliovirus enters the central nervous system via the bloodstream
- ◆ Poliovirus replicates within the anterior horn cells of the CNS leading to motor neuron degeneration and paralysis of one or more limbs and sometimes involves bulbar paralysis

Vaccination

- ◆ Humans are the only reservoir for poliovirus and high level vaccine coverage can interrupt person-to-person transmission
- ◆ Four vaccinations are recommended to ensure full immunity against all three serotypes
- ◆ The Sabin oral polio vaccine (OPV) is a live attenuated vaccine
- ◆ In rare instances - approximately 1 in 2.5 million first-time vaccinations - the OPV virus strains may mutate and cause paralysis, known as vaccine associated paralytic poliomyelitis (VAPP)
- ◆ Vaccine derived poliovirus (VDPV), arises from long-term replication of an OPV strain in one or more persons, resulting in an accumulation of mutations which can lead to the loss of attenuation
- ◆ VDPVs vary by more than 1% in the VP1 gene from the prototype Sabin strain
- ◆ Sustained person-to-person transmission of a VDPV may give rise to a circulating VDPV (cVDPV), which may cause paralysis due to loss of attenuation
- ◆ Numerous cVDPV outbreaks were reported including Philippines (2001), Indonesia and USA (2005)
- ◆ An immunocompromised person vaccinated with OPV, may become chronically infected and establish long-term excretion of an immunodeficient VDPV (iVDPV)
- ◆ The Salk inactivated poliomyelitis vaccine (IPV) is administered by needle and consists of the three poliovirus serotypes inactivated by formalin
- ◆ IPV is available in Australia as an individual preparation and as a combination vaccine
- ◆ Since November 2005, IPV is the only polio vaccine available in Australia through the National Immunisation Program

AFP surveillance and the global polio laboratory network

- ◆ Acute flaccid paralysis (AFP) is the major clinical presentation of poliovirus infection
- ◆ The WHO indicator target for countries no longer endemic for polio, such as Australia, is 1 case of AFP per 100,000 children less than 15 years of age
- ◆ Australia would be expected to report 40 cases of AFP in children each year
- ◆ Guillain Barre syndrome, transverse myelitis and infant botulism also present as AFP
- ◆ Other enteroviruses, including enterovirus 71 and echovirus 11, have been associated with AFP
- ◆ WHO requires laboratory testing of two faecal specimens collected 24 hours apart and within 14 days of onset from all cases of AFP, whether or not the clinical diagnosis is poliomyelitis
- ◆ WHO established a global laboratory network for isolation and testing of poliovirus
- ◆ The Australian National Polio Reference Laboratory is located at VIDRL and is accredited annually by WHO as part of the certification procedure for the global eradication of poliomyelitis

Future newsletters will be a brief one page to keep collaborators in touch with the progress of the eradication program.

From <http://www.polioeradication.org>