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Poliomyelitis

Introduction

Poliomyelitis (polio) is a vaccine-preventable disease caused by the polio virus, a small RNA virus, of the genus *Enterovirus* within the picornavirus family. There are three serotypes of the human poliovirus (poliovirus 1, 2 & 3) [1]. Although great strides have been made in the global eradication of polio, four countries remain endemic for the disease (Afghanistan, India, Nigeria, Pakistan) with several others in Africa, Asia, and the Middle East reporting cases related to importation [2].

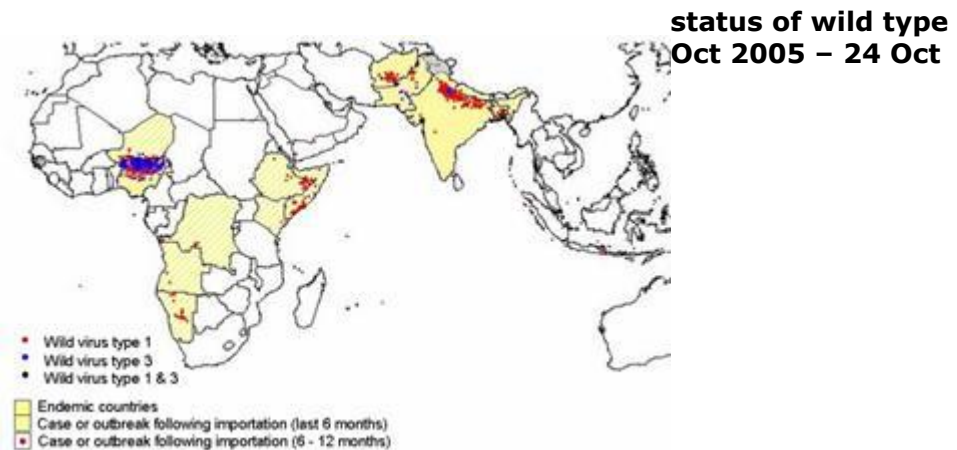
Epidemiology

Global Epidemiology [2]

In 1988, more than 125 countries in five continents were endemic for polio, with more than 1000 children paralysed every day. In that same year, the World Health Assembly voted to launch a global initiative to eradicate polio by 2000. The Global Polio Eradication Initiative was set up by national governments, the World Health Organization (WHO), Rotary International, the US Centers for Disease Control and Prevention (CDC) and UNICEF, and is the largest public health initiative ever known. The Initiative involved collaborative efforts

to improve surveillance of polio and to organise immunisation campaigns. These activities have interrupted transmission of polio in over 100 countries.

Figure 1. Global polio virus, 25 2006



Map reproduced from the Global Polio Eradication Initiative website, <http://www.polioeradication.org/content/general/casemap.shtml>

The number of cases reported worldwide has declined from 350,000 in 1988 to 1486 in 2005. However, importation of polio from endemic countries continues to be a problem. As of October 2006 four countries remain endemic for polio: Afghanistan, India, Nigeria and Pakistan. Nigeria accounted for 61% (921 cases) of the 1,500 cases reported globally in 2006 (as of 24 October 2006) and India accounted for 28% (416 cases) of the total. In addition to endemic countries, Angola, the Democratic Republic of the Congo, Ethiopia, Kenya, Namibia, Niger, and Somalia in Africa, and Bangladesh and Nepal in



Asia are considered to have active transmission of an imported polio virus [2]. Other countries outside of the regions that have eradicated polio (WHO regions of the Americas, Western Pacific and European) may also be a risk for travellers.

Polio in Travellers from England and Wales

Control of polio in the UK is excellent and there have been no confirmed cases of wild type polio in more than a decade. The last imported case reported was in a child who had travelled to India in 1993 [3].

Risk for travellers

Three regions of the world (the Americas, Western Pacific and European regions) have eradicated wild type poliovirus so travel to these regions presents a negligible risk. The risk of acquiring polio for those visiting countries outside of these regions will depend upon several factors including living conditions, length of stay and standards of food and water hygiene. The risk is highest for those intending to visit areas where there may be poor sanitation [4, 5].

Transmission

Polio is transmitted via the faecal-oral route either by exposure to faecally contaminated food or water, or by person to person contact. Pharyngeal secretions may contain virus and could play a limited role in transmission [6, 7].

Signs and symptoms

These can be categorised according to the severity of symptoms [1]:

- **Asymptomatic**

Accounts for up to 95% of all polio infections. Estimates of the ratio of asymptomatic to paralytic illness vary from 50:1 to 1000:1 (usually 200:1).

- **Minor, non-specific**

Accounts for 4%-8% of infections. Three syndromes are seen and may be indistinguishable from other viral illnesses:

- upper respiratory tract infection (sore throat and fever)
- gastrointestinal disturbances (nausea, vomiting, abdominal pain, constipation, or rarely diarrhoea)
- influenza-like illness

There is no central nervous system invasion and recovery is less than a week.

- **Non-paralytic aseptic meningitis**

Occurs in 1%-2% of infections and is characterised by a non-specific prodrome followed by stiffness of the neck, back, and/or legs. Lasts from two to ten days with complete recovery.

- **Flaccid paralysis**

Occurs in less than 1% of all polio infections. Prodromal symptoms last for one to ten days followed by paralytic symptoms which progress over two to three days and stabilise as the temperature returns to normal.

There may be two phases, especially in children. Minor symptoms may be followed by a one to seven day interval before the onset of flaccid paralysis with diminished deep tendon reflexes.

Death rates are generally 2%-5% of cases in children and up to 15%-30% of cases in adults (depending on age), increasing to 25%-75% of cases with bulbar involvement.



About 50% of people with paralytic polio recover without paralysis. Another 25% have mild permanent disability, and 25% have permanent severe paralysis. Rarely persons, who have made a complete recovery from polio, will develop a return or worsening of muscle weakness 15 or more years after this attack of polio. This is called Post Polio Syndrome.

Treatment

There are no antiviral drugs available, so treatment is supportive. This includes bed rest and respiratory support if there is respiratory muscle paralysis. Occupational therapy, physiotherapy, and occasionally surgery have important roles in patient rehabilitation [1,6].

Prevention

- Effective vaccination is available.

Travellers should also be advised to:

- Observe a high level of personal hygiene i.e. hand washing, especially after using the toilet and before eating.
- Only swim in chlorinated water or that which is unlikely to be contaminated with sewage.
- Eat food that has been thoroughly cooked and is served piping hot.
- Avoid salads and fresh fruit [5-8].
- See link to [food & water hygiene](#) advice

Vaccine Information

Indications for use of vaccine

Polio vaccine is recommended for:

- All infants from two months of age
- Travellers to areas or countries where poliomyelitis is epidemic or endemic and their last dose of polio vaccine has been 10 or more years ago [5, 9].
- Individuals not previously immunised

Availability of vaccine

In September, 2004, inactivated polio vaccines replaced oral polio vaccine in UK vaccine schedules. The change to an inactivated vaccine simplified paediatric vaccine schedules and eliminated the small risk of vaccine associated paralytic poliomyelitis from OPV. This change was also made recognising the decreased risk of imported wild type polio following the global efforts at polio eradication [10].

Vaccine schedules [11-13]

Vaccine	Manufacturer/ distributor	Schedule	Length of protection	Age range
Pediacel® (diphtheria, tetanus, 5 component acellular pertussis, inactivated polio vaccine and Haemophilus	Sanofi Pasteur MSD	Primary immunisation at 2, 3 and 4 months	Three years DTaP/IPV and life for Hib	2 months – 10 years

influenzae type b vaccine – DTaP/IPV/Hib)				
Repevax® (low dose diphtheria, tetanus 5 component acellular pertussis and inactivated polio vaccine – dTaP/IPV)	Sanofi Pasteur MSD	Pre-school booster; single dose	Seven years for the dT/IPV. No data on aP.	3 years, 4 months – 5 years
Revaxis® (low dose diphtheria, tetanus and inactivated polio vaccine Td/IPV)	Sanofi Pasteur MSD	Single dose booster.	10 years	10 years and over

A course started with OPV can be completed or reinforced with IPV and vice versa [14].

Interrupted courses

Pediacel®: [11]

There is no data regarding the administration of Pediacel® for one or two doses and use of different vaccines for other doses. Therefore it is recommended that infants who receive Pediacel® for the first dose should also receive this vaccine for the second and third doses of the primary immunisation series.

Repevax® [12] & Revaxis® [13]

Not applicable, single dose.

Contraindications

- History of hypersensitivity to the vaccine or its components
 - Acute febrile illness / intercurrent infection
- Contraindication to Pediacel® [11] & Repevax® [12]
- Neurological complications of unknown origin within 7 days of previous vaccination.

Adverse events

Pediacel® [11]

- Clinical trials have shown that adverse reactions following polio vaccine tend to be mild and transient. They can include soreness, erythema and induration at the injection site.
- More serious reactions e.g. febrile convulsions, gastrointestinal problems and irritability have been rarely reported.

Repevax® [12]

- Clinical trials have shown that adverse reactions following polio vaccine tend to be mild and transient. They can include soreness, erythema and induration at the injection site.
- More serious reactions e.g. gastrointestinal problems, dermatitis and arthralgia have been rarely reported.

Revaxis® [13]



- Clinical trials have shown that adverse reactions following polio vaccine tend to be mild and transient. They can include soreness, erythema and induration at the injection site.
- More serious reactions e.g. gastrointestinal problems, vertigo and malaise have been rarely reported.

References

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www.cdc.gov/mmwr/preview/mmwrhtml/rr4905a1.htm

Reading list

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- Cook G, Zumla A, editors. *Manson's Tropical Diseases* 21st ed. London: WB Saunders Co Ltd; 2003.
- Plotkin S, Orenstein W editors *Vaccines* 4th ed. Philadelphia: WB Saunders Co Ltd; 2004

Links



Centers for Disease Control (CDC) www.cdc.gov/travel/diseases/polio.htm

Committee to Advise on Tropical Medicine and Travel (CATMAT)
www.hc-sc.gc.ca/pphb-dgspsp/tmp-pmv/info/polio_e.html

WHO Global Polio Eradication Initiative <http://www.polioeradication.org/>