

POLIO / VDPV2

Incidence of disease in communities (Case Study A)

MODULE: Introduction to Public Health
(LCHS4004)

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Introduction

According to NHS, poliomyelitis, further known as polio or infantile paralysis, is an illness brought on by a virus called poliovirus. The poliovirus invades our system of nerves and, in the most severe cases, can cause paralysis. Poliomyelitis is a very contagious disease; it can be transmitted from person to person very quickly. Young children under the age of five are the most affected, but it can also affect adults.

Two types of vaccine are available today, an inactivated poliovirus vaccine (IPV) and a live attenuated OPV.

Vaccine-Derived Poliovirus type 2

A VDPV2 (vaccine-derived poliovirus type 2) is a rare strain of poliovirus, frequently discovered in groups who have incomplete vaccinations. They are known as “vaccine derivatives” as a result of the modified form of a strain originally contained in oral polio vaccine (OPV). OPV contains a live but weakened form of poliovirus. On uncommon occasions, when they replicate in the human gut, strains of OPV undergo genetic mutations and can spread into communities that are not fully vaccinated against polio, particularly in places where good hygiene is lacking, sanitation is poor or where there is overpopulation. As these viruses move from person to person, more alterations take place, and if one manages to continue to spread in an under-vaccinated population, it may, with time, genetically change to the point that it regains the power to cause paralysis, resulting in the emergence of a VDPV2.

Symptoms

About one in four people infected can have symptoms like flu. Symptoms can also resemble those of gastrointestinal infections, with feeling sick, vomiting, constipation and abdominal pain (stomach-ache). There is a very small chance of paralysis, but when it happens is frequently permanent. Polio cannot be cured but can be prevented by vaccination.

Transmission

Transmission happens directly from one person to another through very small drops that come out of our mouth and nose when we talk, cough or sneeze. Transmission can also happen when a person has direct contact with contaminated faeces or drinks contaminated water or food. The polio virus develops in the throat or intestine and spreads through the bloodstream. Upon reaching the central nervous system (medulla and brain), the virus attacks the neurons and can cause paralysis. Places without basic sanitation and good housing and hygiene conditions are most affected by the disease.

Strategies used in UK to measure Polio/VDPV2

Morbidity Data

Incidence

According to UK Health Security Agency, in 1984, UK had confirmed the latest case of polio. In 2003, the UK was deemed polio-free. But recently The UK Health Security Agency proclaimed a "rare national incidence" on June 22, 2022, after poliovirus was discovered in London's sewage for the first time in almost 40 years.

Prevalence

According to Uwishema, even if there haven't been any paralytic instances for five years, the likelihood of silent transmission may still be between 0.1% and 1.0%.

Mortality data

There are currently no recorded polio death cases in the UK, but for paralytic polio, the case fatality ratio typically ranges from 2% to 5% in children to up to 15% to 30% in adults, according to Estivariz C., 2021.

Strategies used in UK to monitor Polio/VDPV

According to Polio Global Eradication Initiative, one important tactic for keeping track of the destruction of poliomyelitis is through the use of the surveillance of acute flaccid paralysis (AFP). The four steps of surveillance are:

- finding and reporting children with acute flaccid paralysis (AFP)
- transporting stool samples for analysis
- isolating and identifying poliovirus in the laboratory
- mapping the virus to determine the origin of the virus strain.

Environmental surveillance is another successful response to quickly monitoring and detect any poliovirus. Testing for the poliovirus entails looking for it in sewage or other environmental samples. According to WHO, environmental surveillance has the advantage of allowing us to identify the presence of polio in an area before any instances of paralysis show, because the majority of poliomyelitis patients are asymptomatic, yet all infected individuals shed virus in their faeces.

Strategies used in UK to control Polio/VDPV

To control a polio outbreaking, rapid response campaigns must be performed with enough quality to achieve high levels of vaccine coverage ($\geq 95\%$) and strong vital immunisation services, according to Polio Global Eradication Initiative.

According to the WHO, the strategies implemented to control a outbreaking by the United Kingdom Health Security Agency were:

- Enhancing polio surveillance in the medical, laboratory, and environmental spheres.
- In London, a catch-up initiative aimed at kids under 5 years old was launched in June 2022, and in the beginning of August 2022, a supplemental booster inactivated polio vaccine (IPV) programme aimed at kids between the ages of 1 and 9 years old in London was initiated.
- Health experts, public health personnel, and laboratory workers were informed about the discovery of VDPV2 in London.
- Health professionals are reminded of the significance of ensuring that routine adult immunisations are up to date and that newly registered children's immunisations are as well, with a focus on under-immunized populations.
- All enterovirus-positive stool samples should be sent to the UKHSA, according to a request made to local and regional labs.
- Improving environmental samples to determine how widely the virus has spread throughout London. Additionally, numerous additional sewage sample locations are being established around the nation.

Conclusion

The success of VDPV2 prevention, detection, and control is keeping the routine children immunisation program's excellent vaccine coverage rate. In order to limit the risk of importations of VDPVs resulting in transmission in under-vaccinated communities and paralytic presentations, it is crucial to maintain high uptake at the national, regional, and local levels. Another important strategy is maintaining active surveillance systems working by documenting and testing each instance of acute flaccid paralysis in children younger than fifteen.

Even if polio hasn't been found in years, is essential to make sure that if the virus crosses border it will be found and stopped. Every link in the surveillance chain needs to be fixed together, because it is the information that results from a well-functioning surveillance system that lets experts know when and where vaccination campaigns are urgently needed.

References

Anon., n.d. *Polio Global Eradication Initiative*. [Online]
Available at: <https://polioeradication.org/polio-today/polio-now/surveillance-indicators/>
[Accessed 20 12 2022].

Estivariz, C. F., Link-Gelles, R. & Shimabukuro, T., 2018. Poliomyelitis. *National Center for Immunization and Respiratory Diseases*, Issue 14.

NHS, 2022. *NHS*. [Online]
Available at: <https://www.nhs.uk/conditions/polio/>
[Accessed 20 12 2022].

UK Health Security Agency, 2022. *GOV.UK*. [Online]
Available at: <https://www.gov.uk/government/news/poliovirus-detected-in-sewage-from-north-and-east-london>
[Accessed 20 12 2022].

Uwishema, O. et al., 2022. Poliovirus returns to the UK after nearly 40 years: current efforts and future recommendations. *Postgraduate Medical Journal*, 98(816-819).

World Health Organization, 2021. *Polio Eradication Strategy 2022–2026: Delivering on a promise*.

World Health Organization, 2022. *Disease Outbreak News; Detection of circulating vaccine derived polio virus 2 (cVDPV2) in environmental samples– the United Kingdom of Great Britain and Northern Ireland and the United States of America*. [Online]
Available at: <https://www.who.int/emergencies/disease-outbreak-news/item/2022-DON408>
[Accessed 20 12 2022].