

Heading Towards - National Switch Day

Kapil Goyal¹ and Mini P Singh^{2*}

¹*Department of Medical Parasitology, Postgraduate Institute of Medical Education and Research, India*

²*Department of Virology, Postgraduate Institute of Medical Education and Research, India*

***Corresponding Author:** Mini P Singh, Department of Virology, Additional Professor, Postgraduate Institute of Medical Education and Research, Chandigarh, India.

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Abstract

'Polio' will soon be a history in near future. The credit for reaching this target will not only be due to the 41st World Health Assembly resolution (WHA41.28) for global eradication of poliomyelitis, but also due to the strong commitment shown by each and every nation. All the nations not only fought but also are still fighting the battle against polio unitedly [1].

Keywords: *Polio; National Switch Day; Oral polio vaccine*

Introduction

The possibility of polio eradication has become possible due to the availability of oral polio vaccine (OPV), which can be administered orally in the form of drops during the Pulse Polio campaigns and supplementary immunization activities (SIAs). Since 2000, OPV has been successfully used to vaccinate 3 billion children that has resulted in the prevention of approximately 13 million polio cases, which contributes to a significant decrease of polio cases by more than 99% [2].

In the year 1961, Albert Sabin developed trivalent oral polio vaccine also known as Sabin vaccine that consists of three different types of poliovirus (type 1, 2 and 3) in live attenuated form, hence the vaccine required a cold chain system during transportation and storage to maintain its viability [3]. After oral administration of OPV, live attenuated virus multiplies in the intestinal tract and provides local immunity. It also provides systemic immunity by forming protective antibodies. The vaccinee excretes the virus for 6-8 weeks thereby providing herd immunity to the unimmunized individuals. In one of the published study, it has been highlighted that multiple doses of OPV are required to generate an effective immune response in developing countries where hygienic conditions are poor and other gastrointestinal infections compete with the virus to generate effective immunity. Thus, dedicated regular immunization rounds need to be conducted to provide protective immunity against wild type polio virus (WPV) [4].

In recent years, total number of poliomyelitis cases due to WPV has decreased to such a level that these were only reported among four countries namely, Pakistan, Afghanistan, India and Nigeria (PAIN). However, due to the efforts taken under Polio Eradication and Endgame Strategic Plan (PEESP) 2013-2018, at present polio is endemic only in Pakistan and Afghanistan and pain of 'PAIN countries' is reduced to half. Officially, WHO South-East Asia Region was certified polio free on 27th March 2014, where quarter of world's population resides in 11 countries [5].

During its course over past several years, the Polio eradication programme has faced many challenges. The biggest challenge was the access to remote faraway places, where difficult geographical terrain restricted the mobility of the health care teams. Another, challenge faced by health agencies was related to the misconception among Muslim community regarding the fear of sterility among their children vaccinated with OPV. The same problem was faced in the states of Bihar and Uttar Pradesh. However, with the involvement of local community leaders along with Muslim leaders, misconception was cleared and not even single case has been reported in India, since January 2011. Similarly in Nigeria also no polio case due to WPV has been reported, since 24th July 2014 [6].

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It is pertinent to discuss the reason for the endemicity of polio in Pakistan and Afghanistan. Due to Taliban's ban on polio vaccination campaigns in the federally administered tribal areas, large population was left unvaccinated and majority of the polio cases were reported from the same region. Many health care teams offering polio vaccination were killed as they were considered foreign spy agents. However, inactivated polio vaccine (IPV) has been successfully launched in FATA (Federally Administered Tribal Areas) and Khyber Pakhtunkhwa in its expanded programme on immunization. A total of 16 polio cases were recorded in 2015 from the FATA [7].

Other factors, which require attention, are the effects of recent outbreaks/ natural disasters on the Polio eradication programme. Conflicts and local wars force the general population to migrate across the borders, causing a threat to transmit the polio in non-endemic area, if the migrated population largely remains unimmunized. It has also been seen that during Ebola outbreak, polio teams were mobilized for outbreak control which resulted in decreased supplementary immunization activities in Lagos (Nigeria) [8]. This may lead to increase in unimmunized population that may cause polio cases in the same region. Similarly, during recent Nepal earthquakes, polio teams and infrastructure were utilized to provide emergency services that led to the decrease in the total time spent by polio workers on polio related activities. Thus, strong vigilance and surveillance is required during times of other emergencies so that polio eradication programme does not deviate from its aim [5].

As the total number of polio cases due to WPV has decreased to negligible numbers, a danger of vaccine associated paralytic poliomyelitis (VAPP) due to vaccine derived poliovirus (VDPV) is hovering around [2]. Whenever, live attenuated polio virus is allowed to remain in the environment for a long time such as up to one year, it may undergo genetic change due to mutations and genetic recombination with other enteroviruses present in the environment. These vaccine derived polioviruses are labeled as circulating VDPVs, which may cause infection and VAPP in areas where there is under coverage of vaccination [9].

Since 1999, WPV2 has not been detected and the only source of type 2 poliovirus is the strain present in trivalent OPV. Thus, whenever there is a rise in susceptible population then chances of getting VAPP increases due to cVDPVs. In some immune-compromised individuals, polio virus strain present in OPV is excreted for a longer duration of 6 months to 1 year allowing enough time for the strain to mutate to cause VAPP, which is termed as iVDPV. The third type is labeled as ambiguous type of VDPV (aVDPV), which is present in the environment and its source is not known. Many outbreaks due to VDPVs have been documented in the past [9].

Therefore, similar outbreaks may also be expected due to polio strain of type 3 present in the vaccine, as last case due to WPV3 was reported on April 18, 2012 in FATA. At present only WPV1 is in circulation [9].

To prevent the infection due to WPV or VDPV, optimum vaccine coverage is a prerequisite. Another strategy is to introduce the injectable polio vaccine (IPV) that contains killed polio virus, hence not associated with danger of VAPP and simultaneously, within short span of time, replacing the trivalent OPV with bivalent OPV as WPV2 is not present in circulation since 1999.

For the first time in history, such a large scale introduction of IPV in routine immunization is proposed to be implemented. To achieve this, strategic Advisory Group of Experts on immunization (SAGE) confirmed that global switching from trivalent OPV to bivalent OPV should occur in April 2016, specifically between 17 April 2016 to 1 May 2016. Every country will announce it as 'NATIONAL SWITCH DAY', which will be a major turning point in eradication of polio. Though, IPV is costlier than OPV, but to meet the target of polio eradication by 2018, one has to compromise with the cost factor and regular supplies of IPV should be made available. Also, efforts should be made to produce low cost IPV for developing countries [2,5,9].

Last but not the least, after eradication of polio, the manpower and infrastructure build over past so many years, also termed as backbone of polio eradication programme may be utilized for providing immunization/ health care at door steps in future. In India, in most of the cases, the same teams and the lab infrastructure are being utilized for measles eradication. Thus, experienced gained over the past several years and existing infrastructure will be utilized in future for eradicating other infectious diseases against which suitable vaccine candidate is available [10]. 'Legacy in action' i.e. last objective of PEESP should also be planned and executed in a well-planned manner to enrich our future generations with better and good health.

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