

Commentary on “LIVE, ORALLY GIVEN POLIOVIRUS VACCINE - EFFECTS OF RAPID MASS IMMUNIZATION IN POPULATION UNDER CONDITIONS OF MASSIVE ENTERIC INFECTION WITH OTHER VIRUSES”

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The following is a commentary on the article “Sabin AB, Ramos-Alvarez M, Alvarez-Amezquita J, Pelon W, Michaels RH, Spigland I, et al. Live, orally given poliovirus vaccine: effects of rapid mass immunization on population under conditions of massive enteric infection with other viruses. *Jama*. 1960;173(14):1521-6.”

Abstract (of the original article):

The phenomenon of viral interference must be taken into account in planning the use of live poliovirus vaccine in areas where conditions favor the extensive dissemination of naturally occurring polioviruses. Experience with feeding a trivalent vaccine to 26,033 children in a tropical city of 100,000 population led to the conclusion that interference was overcome by mass feeding of vaccine to 86% of all children under 11 years within a period of about four days, and that, because dissemination of the poliovirus was self-limited, a second feeding of trivalent vaccine was necessary to achieve immunization of almost all children. Recommendations are here formulated for the eradication of poliomyelitis, but they apply only to subtropical and tropical regions with extensive dissemination of various enteric viruses and not to temperate zones with good sanitation and hygiene during certain periods of the year and under conditions of low or absent dissemination of enteric viruses.

As the world prepares to turn a new leaf in its fight against poliomyelitis, it is imperative to review the beginning of this ambitious public health task. In this issue of “*Annals of Community Health*”, we shall take a fresh look at an article originally published in *The Journal Of The American Medical Association*, (AUGUST 6, 1960) and reprinted in *Bulletin of the World Health Organization* 1999,71(2). The article under review discusses the utility of live oral polio vaccine in mass immunization programmes under conditions of massive enteric infection.

The article highlights the importance of the use of live poliovirus vaccine in areas with climatic and hygienic conditions which permit extensive dissemination of naturally occurring polioviruses and other enteric viruses

throughout the year has been complicated by the problem of viral interference.

Among the various candidate strains, the strains developed by Sabin were selected for widespread application because they provided good antibody levels and were less neurotropic for monkeys. Since 1973 WHO has been directly responsible for the custody and distribution of the Sabin strains of OPV and has exercised strict supervision over production laboratories in cooperation with national control authorities.¹

Most early trivalent preparations of OPV contained the three poliovirus types in equal proportions. The “balanced” formulation was adopted in Canada in 1962 and a similar formulation was adopted in the USA in 1963. Since

studies of monovalent preparations in developing countries (most of these studies were with non-Sabin strains) had shown serological responses in children similar to those seen in industrialized countries, the “balanced” trivalent formulation was adopted for use in developing countries without further testing.¹

During the 1970s less-than-optimal responses to trivalent OPV in developing countries became apparent when reports of low rates of seroconversion to poliovirus types 1 and 3 began to appear in the medical literature. The precise cause of lower seroconversion rates to types 1 and 3 in some parts of the developing world is not clear. It has been thought to be due to interference of type 2 vaccine virus and enteric pathogens with the response to types 1 and 3,

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but this interference maybe partially overcome by modifying the absolute and relative dosage of the three Sabin vaccine virus types. The interval between doses may also be important, in view of prolonged excretion of vaccine virus and the potential for interference.¹

But it has been observed that Worldwide, sustained use of poliovaccines since 1988 has led to a precipitous drop in the global incidence of poliomyelitis by >99% and the number of countries with endemic polio from 125 to just 3. In 2012 and 2013, respectively 223 and 403 poliomyelitis cases were reported.

The WHO position paper published in January 2014 outlines the context of the global switch from trivalent to bivalent OPV. It also suggests An IPV---only schedule may be considered in countries with both sustained high Immunization coverage and the lowest risk of both WPV importation and transmission. To mitigate the risk of undetected transmission, WHO recommends that endemic countries and countries with a high risk of WPV importation should not switch to an IPV---only or a sequential IPV- OPV schedule at this time.²

The new global standard should reflect new developments in areas related to OPV including advanced scientific knowledge, the availability of novel laboratory techniques and the use of new vaccine formulations such as monovalent/bivalent OPV or inactivated polio vaccines (IPVs) based on Sabin seeds.³

So, in spite of questions raised over the effectiveness of OPV due to viral interference, one cannot ignore its contribution towards eradication of poliomyelitis. Oral polio vaccine developed by Sabin will remain an important medical discovery of this century.

REFERENCES

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