Commentary: Poliomyelitis and unnecessary injections

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Although vaccines to prevent poliomyelitis have been available for 48 years, paralytic disease continues to occur in some areas, as reported by Kohler et al.¹ elsewhere in this issue of the International Journal of Epidemiology. Let us hope that by the 50th anniversary of the development of the first successful poliomyelitis vaccine all transmission of wild-type polioviruses will have ceased. The World Health Organization (WHO)-sponsored polio eradication programme has encountered and overcome many problems as we approach the final months of this enormously successful effort which has helped to revitalize immunization programmes throughout the world.² Transmission of naturally occurring wild-type 2 polioviruses has been interrupted; there have been no wild-type 2 isolates anywhere for more than 2 years in spite of intensive surveillance.³ Elimination of wild types 1 and 3 viruses will take longer, in part because three doses of oral poliovirus vaccine (OPV) induces protection against type 3 polioviruses in only 75% of children in developing countries.⁴ Therefore, it is not surprising that 89% of the children with paralysis in the report by Kohler et al. had received three doses of OPV. The administration of supplemental OPV doses in national immunization day campaigns overcomes the incomplete protection, reaches children who do not receive recommended vaccines in routine programmes, and is an effective method of control. Administering one or more doses of inactivated polio vaccine (IPV) significantly improves the protection from three doses of OPV.⁵

New problems have emerged in recent years that will make the global eradication effort more difficult than initially anticipated, including identification of immunodeficient persistent carriers of OPV-derived viruses⁶ and outbreaks of vaccine-derived paralytic polio in several countries that had been certified as polio-free.⁷,⁸ Also, new challenges will impact on the post eradication polio vaccination strategies in all countries, including the theoretical risk of using polio viruses as a bioterrorism agent and the successful synthesis of a wild-type poliovirus.⁹ The industrialized countries that currently use IPV and other countries that are changing from OPV to IPV will continue to use IPV for many years after wild-type viruses have been eradicated. The difficult question facing WHO and developing country leaders is: Can routine OPV immunization stop in developing countries after eradication is certified?¹⁰ If not, will some countries continue to use OPV and accept the risk of one case of vaccine-associated paralytic poliomyelitis (VAPP) for every 760 000 to 2.8 million children vaccinated,¹¹,¹² or can they afford to change to the more expensive IPV? Continuing to accept the scores of children paralyzed by OPV every year seems untenable after convincing evidence becomes available that wild-type viruses are no longer circulating and the risk of reintroduction from laboratory accidents is remote.

Unnecessary injections were associated with paralysis in the outbreak reported by Kohler et al.¹ The WHO estimates that over 12 billion injections are given every year, over 90% are for therapeutic purposes, and most are unnecessary (www.injectionsafety.org). Multiple injections can increase the risk of paralysis from OPV as well as wild-type viruses.¹³ Administering IPV before OPV in a sequential schedule can prevent provocation of polio.¹⁴ If all countries could use IPV only or a sequential IPV-OPV schedule, the problem of VAPP would be largely eliminated and decisions about stopping all polio vaccination could be reconsidered every few years. Unfortunately, the current high cost of IPV is prohibitive for most developing countries and there is an inadequate supply to meet potential global needs. Increased efforts are needed to make IPV available at reduced costs for developing countries without the need for extra injections through the use of combination DTP-IPV products.

Another cause of preventable paralysis is injection into the buttocks, a practice that is discouraged because of potential damage to the sciatic nerve.¹⁵ Unfortunately, photographs of children receiving immunizations in the buttocks are still being published, a tacit endorsement of this unsafe practice. Other problems associated with unsafe injections include transmission of hepatitis B, hepatitis C, human immunodeficiency virus, and other blood-borne pathogens.¹⁶,¹⁷ As noted by Kohler et al.,¹ the majority of inappropriate injections are given by traditional healers and other unsanctioned individuals administering products of dubious value for treatment of fever and other ailments. The Integrated Management of Childhood Illnesses (IMCI) programme that is being implemented in many countries reduces unnecessary therapeutic injections by providing appropriate low-cost oral treatment for most illnesses.¹⁸ The recently established Safe Injection Global Network (SIGN) (www.injectionsafety.org) initiative combats unsafe injections and targeted intervention programmes have already reduced hepatitis B and C transmission in some areas.¹⁷ Intensive efforts and increased resources are needed to combat the problems associated with unnecessary and unsafe injections.

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