Poliomyelitis in Pakistan

Samuel L. Katz
Department of Pediatrics, Duke University School of Medicine, Durham, North Carolina

(See the Major Article by Alam et al on pages 190–8.)

Keywords. poliovirus; Pakistan; vaccine.

Encouraged by the 1980 success of global smallpox eradication, the World Health Assembly in 1988 passed a resolution launching the Global Polio Eradication Initiative with its goal for the year 2000. At that time, it is estimated that there were >350,000 paralytic polio cases annually in 125 countries. Although the target of eradication by the year 2000 has long since been passed, it is noteworthy that despite the challenges of enormous obstacles and the expenditure of more than 10 billion dollars, thanks to the efforts of countless thousands of personnel and millions of vaccinators, by October 2015 only 39 polio cases were identified in the entire world, 30 in Pakistan and 9 in Afghanistan, all due to wild type 1 polioviruses. Type 2 virus has not been identified since 1999, and type 3 not since November 2012. Though numbers are reduced, the troublesome problem of circulating vaccine-derived polioviruses, nearly all type 2, persists (12 in the first 8 months of 2015) but is under attack by the plan to switch from trivalent oral poliovirus vaccine (OPV) to bivalent (types 1 and 3) in April 2016 and the introduction of a single injection of trivalent inactivated poliovirus vaccine into all national schedules.

Confronted with the challenges of persistent polio in their country, Alam et al [1] undertook an exhaustive analysis of the genomics of all type 1 polioviruses isolated in the most recent years (January 2013 through May 2015) from patients with acute flaccid paralysis and from sewage water in Pakistan. Surprisingly, their results revealed that the origins of these isolates other than in 2014 were not from the impoverished migrating populations of the Federally Administered Tribal Areas, including North and South Waziristan, as had previously been assumed, but were from reservoirs of municipal sources in a number of major cities with poorly immunized poverty inhabitants. These data should enable those responsible for programs of poliovirus vaccinations to focus on areas truly at high risk and target those unfortunate children and adults. Alam et al [1] merit congratulations for their revelations, which could promote the elimination of wild poliovirus from the last country currently harboring foci of persistent poliovirus circulation leading to clinical illness.

Barring any unanticipated outbreaks elsewhere, it seems possible that Pakistan (and the cases transmitted to Afghanistan) might mark the final foci of wild poliomyelitis. However, since this publication there have been 2 cases of paralytic disease in Ukraine and 9 in Madagascar, all attributed, however, to type 1 circulating vaccine-derived poliovirus. The continuing occurrence of vaccine-derived cases emphasizes the need to introduce inactivated poliovirus vaccine and eventually discontinue OPV in all global programs. Although this is more costly and currently requires vaccine administration by needle and syringe, current research efforts promise reduced vaccine costs with fractional intradermal doses and eventually with the use of needle-free devices.

The World Health Organization (WHO) has published its strategic plan to eradicate polio by 2018 [2], which optimistically focuses on the eradication of wild polioviruses, containment of polioviruses (both wild and OPV) in laboratories and vaccine manufacturing facilities, and measures minimizing the reintroduction of polioviruses. All WHO member states endorsed the resolution, calling for full implementation of the plan. Whether this plan will suffer the long incubation period (1988–2000–?2015) of the Global Polio Eradication Initiative remains to be seen. Challenges will undoubtedly arise, not the least of which may be the current migration of millions to Western Europe from the troubled nations of Africa and Asia.

Note
Potential conflict of interest. Author certifies no potential conflicts of interest. The author has submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Conflicts that the editors consider relevant to the content of the manuscript have been disclosed.

References