IAP Recommendations on Polio Eradication and Improvement of Routine Immunization

In this issue of Indian Pediatrics, the recommendations of the 2nd National Consultative Meeting of the Indian Academy of Pediatrics (IAP) on Polio Eradication and Routine Immunization are presented(1). The recommendations address a range of issues, the most important of which are the proposed modifications to the strategies to achieve polio eradication, a call for a re-commitment to routine immunization in India, and a rationale for using IPV for eliminating the last chains of poliovirus transmission in the most difficult-to-eradicate areas of Northern India. The IAP reaffirms its commitment to polio eradication but raises concerns that time is about to run out and that urgent action is needed to complete the job.

These recommendations were drafted almost 6 months ago and must be considered in the context of a rapidly evolving polio situation in India. What is the current status of polio eradication in India? The situation is mixed but encouraging. The progress reported from Western Uttar Pradesh is especially compelling–no type 1 poliovirus case during 2007 in the 10 most-difficult to eradicate districts. This dispels once and for all any myths about the biological feasibility of polio eradication. Thus far for 2008 (data as of 2 May 2008), only four cases due to poliovirus type 1 have been reported in India. The last case of polio worldwide due to type 2 poliovirus was reported from Aligarh, Uttar Pradesh in October 1999. Thus, almost a decade later, the opportunity presents itself to finally interrupt the remaining chains of poliovirus type 1 transmission in India.

The status of polio eradication efforts in Bihar are cause for concern, type 1 and 3 poliovirus continued to co-circulate in 2007. After a period of more than 3 years of no cases, type 3 poliovirus has caused a large epidemic that began in last quarter of 2007 following importation of the virus from Uttar Pradesh. The epidemic is now being brought under control. The reasons for the relatively large extent of this type 3 outbreak are multi-factorial, but include low routine immunization coverage, difficult access in some areas, and a sub-optimal extent of monovalent oral poliovirus vaccine (mOPV) use. Earlier and more massive use of mOPV3 might have averted or at least shortened or reduced the size of the outbreak. The circulation of poliovirus type 1 in 2007 appears to be primarily associated with the Kosi River embankment and other high-risk blocks where access to all children is difficult. Encouragingly, however, field monitors report a "sea change" in these blocks since January 2008, with State and district authorities now leading the charge to ensure that every child is vaccinated.

Do we need a change in the polio eradication strategies? The strategies have eliminated polio from all but two States in India (and more than 120 countries globally). The lynchpins for polio eradication in India are Uttar Pradesh and Bihar, both of which are the only remaining polio-endemic states in India and have been the source of poliovirus imported to the rest of India and abroad. Uttar Pradesh may have already interrupted poliovirus type 1 transmission and also appears to be on track to possibly interrupt type 3 transmission in 2008. Bihar needs to further intensify and target activities, especially in the well-defined difficult to reach areas. The government has prepared updated plans for these areas that call for the intensification of activities in these difficult-to-reach areas and have already resulted in a massive shift of human resources to the high-risk areas in Bihar. An equal emphasis should be placed on improving routine immunization, building on initiatives that have already begun. Successful implementation of these activities together should make it feasible to eliminate the circulation of poliovirus in Bihar.

In terms of tools for eradication, there is also good news. More effective tools are available to the program; monovalent type 1 oral poliovirus vaccine

(mOPV1) and monovalent type 3 oral poliovirus vaccine (mOPV3) complement the trivalent OPV. Based on experience from Western Uttar Pradesh, massive use of mOPVs should do the job, given that the per-dose efficacy of mOPV1 (estimated about 3-fold higher than tOPV)(2) and mOPV3 (~50% per dose) (N Grassly, Personal communication, 2008) is so much higher than that of tOPV. It appears that the strategies and tools are available to achieve eradication.

Is there a role for inactivated poliovirus vaccine (IPV) to interrupt poliovirus transmission or is IPV detracting attention from the real problems? Maybe, IPV could have helped accelerate the program at one point, as had been recommended by a special meeting of the Indian Council of Medical Research (ICMR) convened in August 2007 that concluded that there might be a role for IPV in interrupting poliovirus transmission(3). Maybe that moment has passed, however, because the current strategies appear to finally be delivering the expected results, and the progress is re-assuring, particularly for poliovirus type 1. Nevertheless, because India is such a huge country, with massive population, and a great variety of local circumstances, a prudent approach would be to acknowledge the progress but continue at the same time to evaluate potential contingencies, of which IPV would be one. At a minimum, it would be prudent to include IPV in a field evaluation of effectiveness in Northern India.

What about the status of routine immunization in India? It is clear that everybody acknowledges the dire state of routine immunization, especially in Uttar Pradesh and Bihar, which has made it very difficult to eradicate polio in these states. But even some of the previously stellar-performing states in Southern India have lapsed recently. A major obstacle to improving routine immunization is poor data quality and management, but there are initiatives built upon the polio eradication infra-structure and experience that have already begun and are showing promise in Uttar Pradesh and Bihar. These include routine immunization microplanning based on polio SIA microplans, using the principles of the Reaching Every District Strategy(4), newborn registration and tracking data from polio SIAs to establish computerized block level beneficiary lists and immunization session monitoring. Based on experience elsewhere, the key for improving routine immunization appears to be societal and political will. Is raising routine immunization a national and state priority? If it is, then we should match the commitment with concrete action plans, expected outcomes, and milestones. The IAP calls for the members to devote one day every week for free routine immunization in their clinics(1). This is a commendable effort, but could leverage the polio infrastructure and the state immunization system to do more. Strengthening routine immunization is a long-term proposition and we should demand steady progress but not expect giant leaps.

The report also addresses post-eradication strategies. The IAP report acknowledges the need to discontinue OPV and advocates for a strategy that includes IPV. A consultative process to review the advantages and disadvantages would be useful. However, a possible paradox, paying more for inducing polio immunity once polio has been eradicated than before. Therefore, local production of "safe" IPV, relying on Sabin strains, and adhering to containment guidelines might offer a potential solution. With selecting an appropriate schedule (fewer doses, fractional doses), antigen reduction through use of adjuvant, and production process optimization, immunity against polioviruses induced by an affordable IPV doesn't have to be more expensive than that induced by OPV. The one strategy that would massively increase the costs is the use of higher combination vaccines with IPV. An affordable IPV, produced locally from Sabin strains, could be the solution to the apparent paradox. The time has come for Indian ingenuity and industry vaccine research and development to re-engineer both IPV and the tactics used to deliver this vaccine.

The need for research to guide post-eradication risk management is also emphasized in the report. It is clear that technological advances could offer solutions to some of the important issues, including how to treat chronic excreters of poliovirus, making IPV safe for production in developing countries and affordable for public health use, and how to optimize control and eliminate any resurgent circulating

vaccine-derived poliovirus in the post-OPV era. Innovations and new scientific data are needed to inform policy-making. A recent seroprevalence survey in Moradabad, Uttar Pradesh, is an example of research that helps to evaluate program performance. The clinical trials of mOPVs in Indore and Hyderabad quantify the immunogenicity of these new tools. More research is needed to assess the status of the program and to guide programmatic action.

The IAP report offers recommendations for the benefit of current and future generations of infants in India. This report should be taken as a starting point that will lead to discussions with all stakeholders, and eventually result in a comprehensive plan to address some of the most pressing issues in immunization in India, especially to strengthening routine immunization. Using routine vaccination coverage as a tool to measure progress in health system development in general would go a long way towards focussing attention on this issue. Polio eradication appears to be within reach in India and IAP reaffirms its commitment to polio eradication. However, to be able to cross the finishing line all stakeholders must be unified in purpose and committed to administer the final blows to polio, to relegate this disease to one that future generations will only know by history.

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Roland W. Sutter, *Hamid Jafari and Bruce Aylward,

*From Polio Eradication Department, World Health Organization, Geneva, Switzerland; and *National Polio Surveillance Project, World Health Organization, New Delhi, India.*

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