Eradicating polio - Building the boat while sailing

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In 2012 we are at a peculiar juncture of polio eradication. There are sufficient reasons for optimism, but there are also many unknowns ahead. Wild poliovirus (WPV) type 2 was eradicated in 1999, providing proof of principle that WPV 1 and 3 can also be eradicated. Only in parts of 3 countries, Nigeria, Pakistan and Afghanistan, WPV 1 and 3 transmissions have not yet been interrupted. The exclusive use of trivalent OPV (tOPV) had some justifications but also major problems not exactly unpredicted. OPV has wide geographic variations of efficacy and inherent genotypic/phenotypic tendency to de-attenuate. Where WPV 1 and 3 transmissions were intense in infancy, the efficacy of types 1 and 3 in tOPV was particularly low. Since 2005 monovalent OPVs (mOPV-1 and 3) with superior efficacy are in use, overcoming the inhibitory effect of type 2 vaccine virus. In 2009, a bivalent OPV (bOPV) containing type 1 and 3 was tested and found non-inferior to mOPVs. Since then bOPV is widely used. Many doubt if WPV 1 or 3 could have been eradicated with tOPV.

For 12 years type 2 vaccine virus was fed to children although WPV 2 was eradicated. Since vaccine viruses cause polio as an adverse reaction (vaccine-associated paralytic polio, VAPP), an ethical dilemma emerged: type 2 VAPP while there is no type 2 WPV polio. Moreover, de-attenuated vaccine viruses with genotypic and phenotypic properties of neuro-virulence and easy transmissibility – called ‘vaccine-derived polioviruses’ (VDPVs) have emerged in many locations where OPV is being used. Post-WPV eradication OPV must be discontinued to stop VAPP, but then silent transmissions of VDPVs will flare up, capturing the niche left by WPVs. True polio eradication must be defined as zero infection worldwide with wild and vaccine viruses.

The availability of bOPV presents the opportunity to use it instead of tOPV – thus avoiding seeding of vaccine type 2 virus any more in the community. However, VDPV-2 circulation must be anticipated; to preempt and intercept it immunity umbrella with inactivated poliovaccine (IPV) must be established before replacing tOPV with bOPV. Once that tactic is found successful, the world will be ready to stop all OPV after global eradication (and certification) of WPV 1 and 3.

http://dx.doi.org/10.1016/j.ijid.2012.05.139

Facing anti-vaccine movements: Myths and facts about adverse events

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Anti-vaccine movements are motivated variously by political, cultural, and/or personal factors. Three tactics used by anti-vaccine activists are 1) creating doubt about vaccine safety, 2) insistence on the individual’s right to decide about vaccination, and 3) requiring that research be done to address the activists’ concerns. Examples of anti-vaccine activities illustrate these points.

A paper by Wakefield, published in the UK in 1998 and subsequently retracted, claimed that autism was caused by the MMR