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Immunogenicity of a supplemental dose of oral versus inactivated poliovirus vaccine.

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Abstract

In many developing countries, the immunogenicity of three doses of live, attenuated, oral poliovirus vaccine (OPV) is lower than that in industrialised countries. We evaluated serum neutralising antibody responses in 368 children aged 6 months and 346 children aged 9 months in Côte d'Ivoire who had previously received three doses of OPV at 2, 3, and 4 months of age, and who were then randomised to receive a supplemental dose of OPV or enhanced-potency inactivated poliovirus vaccine (IPV) at the time of measles vaccination. Although both vaccines increased seroconversion to all three poliovirus types, antibody responses were greater in the IPV group. Among children with no detectable antibody at baseline, IPV was 2 to 14 times more likely than OPV to induce seroconversion (type 1, 80% vs 40% at 6 months [$p < 0.001$] and 81% vs 14% at 9 months [$p < 0.001$]; type 3, 76% vs 22% at 6 months [$p < 0.001$], and 67% vs 5% at 9 months [$p < 0.001$]. Among children with detectable antibody at baseline, IPV was 1.4 to 7 times more likely than OPV to elicit 4-fold or more rises in antibody titre ($p < 0.01$). Geometric mean titres (GMTs) to all three poliovirus types were also consistently higher among IPV recipients than in OPV recipients when measured 4-6 weeks and 13-17 months after vaccination. Administration of a supplemental dose of IPV or OPV, which requires no additional visits or changes in the existing immunisation schedule, might improve protection against paralytic poliomyelitis in communities with suboptimum seroconversion rates after three doses of OPV.

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