Seroresponses of infants and children to one, two, three, and five doses of trivalent OPV

No of doses of OVP	Seroconversion rate (%)			Reference No
	Type 1	Type 2	Type 3	
One	19	61	30	(2)
Two	35	78	48	(2)
Three	69	90	76	(4)
Five	83	96	82	

majority, by repeated doses. Thus five doses are proportionately better than three doses. Some infants remained seronegative to one or more serotypes of poliovirus in spite of receiving five doses of OPV, including two who remained seronegative to all three types of poliovirus. These two had no evidence of immunodeficiency and were clinically normal. They illustrate that the refractoriness to infection and seroresponse may at times be profound and persistent.

On the basis of these results we recommend that the primary course of immunisation for infants in developing countries, especially in the tropics, should consist of at least five doses of OPV given at intervals of four weeks or more.

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Antibody response of infants in tropics to five doses of oral polio vaccine

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Three doses of oral polio vaccine (OPV), as currently recommended, are not sufficient for effective immunisation of infants in tropical countries owing to poor seroconversion rates.[1 2] Consequently paralytic poliomyelitis does occur in vaccinated populations.[3] The seroconversion rates of infants to five doses of OPV are reported here.

Subjects, methods, and results

All infants were aged between 6 and 51 weeks when the first dose of OPV was given, by methods described elsewhere.[4] During the course of investigations the titre of OPV was repeatedly checked and found unchanged from the recommended levels.[4] The interval between doses was four weeks except in a few children in whom it was five or six weeks. Blood was collected from vaccinees immediately before giving the first dose of OPV, and again four weeks after the third dose, when a fourth dose was given. A third sample of blood was collected four weeks after the fifth dose. All sera were tested for the presence and titre of neutralising antibodies at a starting dilution of 1/8, against 100-300 $TCID_{50}$ of poliovirus types 1, 2, and 3.[4]

A total of 78 infants were studied. Sera taken from 55 infants after the third dose of OPV were promptly tested along with their prevaccination sera. Thirty-three infants (60%) who had already seroconverted to the three types of poliovirus, and had received a fourth dose, were not given a fifth dose as no further seroconversions were to be gained in them. The remaining 45 infants were given a fifth dose, and four weeks later 21 were found to have seroconverted to all three types. Sixteen had seroconverted to two types only, and six to one type; two infants remained seronegative to three types.

Since the assessment of seroresponse to five doses of OPV would be biased if only the 45 infants were included and the 33 excluded from analysis, all infants are considered together. Among the total of 78 infants studied, 76 (97%) responded to one or more serotypes and 54 (69%) responded to all three serotypes. The type-specific seroconversion rates are shown in the table.

Discussion

Seroresponses of infants and children to one and two doses of OPV, and of infants to three doses, have been described from this laboratory,[2 4] using similar methods (see table). Obviously there is progressive increase in the seroresponse of vaccinees after each additional dose of OPV after the first. Such a poor seroresponse in the population is due to resistance to vaccine virus "take."[5] These results indicate that this resistance is not absolute, but could be overcome, in the