ABSTRACT

Background. It has been reported that oral polio vaccine (OPV) prepared from Sabin vaccine strains, was irregularly immunogenic in developing countries with evidences of paralytic poliomyelitis cases in fully OPV immunized children. Rare cases of OPV vaccine-associated paralytic poliomyelitis were also reported. While enhanced potency inactivated polio vaccine (IPV) was reported to be safe and highly immunogenic. The immunogenicity of combined IPV and OPV regimens in comparison with OPV regimen in infants was, therefore, studied.

Methods. IPV-IPV-OPV, IPV-OPV-OPV, and OPV-OPV-OPV regimens given at 2, 4, and 6 months of age was assigned at random to 250 infants. Serologic results from microneutralization test were available from 243 (97.2%) and 212 children (84.8%) children after 2 doses and 3 doses poliovirus immunizations, respectively. Test results were evaluated by the criteria recommended by WHO for adequate anti-polio antibody; i.e. neutralizing antibody ≥ 8. Seroprevalence and geometric mean titers (GMTs) were compared.

Results. Prior to the first dose of vaccine, 138 (55.2%) children possed transplacentrally acquired anti-polio-antibodies (titers≥ 8), percentage did not differ between groups. The passive antibodies did not interfere with antibody production after poliovirus vaccine immunizations.

After 2 doses, seroprevalence to poliovirus type 1 was 75%, 69%, and 84% in the IPV-IPV-OPV, IPV-OPV-OPV and OPV-OPV-OPV groups; 81%, 84%, and 96% to type 2; and 78%, 67%, and 89% to type 3. Differences in seroprevalence among the groups were significant for types 1, 2, and 3 (P = 0.0439; 0.0038; and 0.0017). Proportion with adequate antibodies to poliovirus three types in the IPV-IPV-OPV

and IPV-OPV-OPV groups were more or less similar, (53.6% and 51.1%) and significantly lower than that in the OPV-OPV-OPV group (76.8%) (P = 0.0012; <0.0004).

After 3 doses, seroprevalence to type 1 was 88%, 84%, and 91% in the three groups; 92%, 94%, and 100% to type 2; and 92%, 85%, and 95% to type 3, respectively. One OPV dose following 2 IPV doses (IPV-IPV-OPV group) as well as 2 OPV doses following one IPV dose (IPV-OPV-OPV group) increased seroprevalence to all 3 types significantly (P <0.05 for all measurements), but the seroprevalence to all 3 types after 3 doses in the OOO group was not significantly increased. GMT values for types 1, 2, and 3 after 3 doses in the three groups were not significantly increased. Children immunized with IPV-IPV- OPV had proportion with adequate titers to poliovirus three types (80.3%) statistically not different from that in the OPV-OPV-OPV group (87.7%). But such the proportion in the IPV-OPV-OPV group (76.3%) was significantly lower than the OPV-OPV-OPV group ((P = 0.0429). A sequential use of the IPV-IPV-OPV regimen appears to be highly immunogenic and the antibody responses were higher than IPV-OPV-OPV regimen. Use of IPV-IPV-OPV regimen would help eliminate paralytic poliomyelitis from wild virus and reduce vaccine-associated paralytic poliomyelitis.