Immunization Dialogue

Should We Revise the Primary Immunization Schedule

On page 17 of the "IAP Guide Book on Immunization" (Dec. 1996) courtesy Smith-Kline Beecham, it is stated that "Between 2 doses of the same vaccine (DPT and OPV), a minimum interval of 4 weeks should be observed. Increasing the interval between doses to 2 or 3 months actually improves antibody levels. The maximum allowed interval between the first and second dose of a non-live (DPT) vaccine is arbitrarily one year. Between 2nd and 3rd dose also, the minimum interval is 4 weeks, the optimum 3 to 6 months, and the maximum again arbitrarily five years."

One would like to know that in the light of the above statement, why the Time Table for DPT along with OPV during the first year has been changed from 2 months, 4 months and 6 months to 6 weeks, 10 weeks and 14 weeks (page 28)? Although this may lead to early completion of the primary immunization for OPV and DPT, but may result in partially immunized children who may get the disease(s) against which they have been sub-optimally immunised.

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Reply

I am very pleased to know that the IAP Guidebook on Immunization, written carefully, is also being read carefully.

The intervals between doses of vaccines have two competing demands. Increasing the intervals between the first and second and second and third doses to two months (or 8 weeks) instead of one month (or 4 weeks) would certainly improve antibody levels in the case of most non-replicating antigens such as pertussis vaccine, toxoids and injectable polio vaccine. For hepatitis B vaccine, the manufacturers recommend intervals of 1 month between the first and second doses and 5 months between the second and third doses, for obtaining high antibody titers.

On the other hand, 2 or 3 doses of vaccines given in quicker succession provides protective immunity much sooner. When interval between doses is reduced, the seroconversion (development of detectable antibody level) would be faster, but the level (titer) achieved would be lower. Hence, the number of doses has to be increased for improving antibody levels. This principle is used in rapid immunization with cell culture rabies vaccine after exposure, when doses are given on days 0, 3, 7, 14 and 30. Japanese encephalitis (JE) vaccine is often needed at short notice, either due to impending epidemic or for travel to a JE endemic area. Here, the mouse-brain grown inactivated vaccine may be given on days 0, 7 and 30, or even on days 0, 7 and 14, for rapid response. Subsequent booster one year or more later provides longer term protection.

It is true that in the USA the recommended schedule of primary immunization with DPT is 3 doses at 2, 4 and 6 months of age. The WHO EPI schedule, after which the India EPI schedule is fashion*ed,* calls for earlier immunization at 6, 10

and 14 weeks. Although the antibody levels may be somewhat lower, with the booster dose during the second year of life excellent levels would be reached under both schedules. IAP has adopted this schedule for several pragmatic reasons. In general, early start and shorter intervals are better complied with by mothers. In addition, DPT given under the umbrella of maternal poliovirus antibody cover reduces the risk of provocation poliomyelitis. Indeed, IAP was the first agency calling for the revision of the earlier EPI schedule (2-3-4 months) to the 6-10-14 week schedule, way back in 1980, following an IAP Workshop at Vellore.

There is no evidence to suggest that the 6-10-14 week schedule leaves infants only 'partially' or 'sub-optimally' immunized against Diphtheria, Pertussis and Tetanus, as feared by Dr. Yash Paul. Regarding OPV, some 60-70% of infants would be fully protected with 3 doses given at 4 or 8 weeks intervals. To cover the gap in immunity additional doses are essential; increasing the interval would not achieve this. In summary, there is no need to revise the primary immunization schedule at the present time.

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