

Variable Doses of Vaccines According to Age

Immunization schedule for Hib vaccine as recommended by IAP varies with age. This schedule of lessening number of doses of vaccine with increase in age is based on the premise that natural infection induces some immunity and so less number of vaccine doses are needed with increase in age.

Why do we not recommend one dose of rotavirus vaccine only (instead of 2 at present) if a child comes for vaccination at 4 to 6 months of age on the premise that the child may have developed partial immunity by rotavirus infection by this time?

For varicella vaccine, why do we need two doses of vaccine after 12 years of age?

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REPLY

As far as Hib and other conjugate polysaccharide vaccines are concerned, the dose schedule depends on the maturity of the immune system with increasing age and not sub-clinical infection leading to some immunity, as is thought of. That is why one needs lesser number of doses as age advances. This is also proved by the fact that children with baseline antibodies are not protected against disease unless the levels are more than protective levels (which we typically achieved very early in life with conjugate vaccines).

For rotavirus infection, first natural infection is the most severe and often leads to hospitalization. However, it also then protects against severe disease with subsequent exposure to any other rotavirus. Whereas the rotavirus vaccine mimicks this natural process, but without the vaccinee suffering from any rotavirus vaccine virus. Hence to say that only one dose should be enough at 4-6 months is not correct as (i) that particular child may not have been exposed to any rotavirus by that age as is evident by the epidemiology in India; (ii) there is no mild first disease leading to sub-clinical immunity; and (iii) waiting for 4-6 months may lead to first natural infection in that child before the vaccine is given and may lead to severe disease. The second dose is given to ensure seroconversion/protection in those who may not have seroconverted/protected with the first dose.

As far as varicella is concerned, sub-clinical infection is extremely rare and most of the first exposures lead to clinical varicella (severity of which increases with the age). Varicella behaves differently in tropical climate, like ours where up to 39% of children do not get exposure to varicella even till adolescence (hence not getting any “chance” to develop any “sub-clinical” case). From studies done on vaccinees, we very well know that for children >12 years seroconversion with one dose of vaccine is only 79% and that it reached 98% only with 2 doses. Now we also know that even for children <12 year we need 2 doses of varicella vaccine to ensure maximum protection against clinical varicella, especially break-through varicella. Hence we do need 2 doses of varicella vaccine at any given age.

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