Newer Vaccines-Need for Informed Choice

D. K. Taneja, P. Sharma

Currently the National Immunization Programme (NIP) includes vaccines against six diseases, viz. tuberculosis, diphtheria, whooping cough, tetanus, polio and measles. In addition, Hepatitis B vaccine is proposed to be included in the NIP and its operational feasibility is being assessed in 33 districts in 15 cities.1

Besides these vaccines a number of vaccines are available in the country. While it is not possible to include all the available vaccines in NIP, it is important that complete information on the available vaccines including extent of risk due to disease and policy guidelines if any, should be made available to the patients by family practitioners, pediatricians and professional bodies so that they can prioritize the expenditure out of their family budgets.

Currently these vaccines are being promoted by the family practitioners and pediatricians. This is usually being done through advice supporting these vaccines as well as by providing immunization cards with printed schedules for these vaccines. This serves as a guide to parents for immunization of their children which is by and large an incomplete information provided in terms of requirement far independent decision making by the parents.

Many of these vaccines are being promoted directly by the vaccine companies through distribution of printed educational material through doctors or even advertisement in the media. Often such educational material is designed in such a way as an appeal to the parents’ emotions or so that they provide selective scientific information about the disease concerned that leads the parents to only think in terms of getting their child vaccinated. Such promotion is not only unethical but costlier newer vaccines.

The problem is often compounded by lack of easy access to unbiased information or national guidelines about these vaccines. This imposes a limitation on the recommendations to be made for these vaccines. Under the constraints of limited epidemiological information, justification, indications and options for commonly used vaccines are described in the following paragraphs.

Among the available vaccines typhoid, Hepatitis B and MMR are high priority for immunization of young children and have been rightly included in the state sponsored immunization programme in Delhi.

Typhoid is an important public health problem. Its incidence is high not only in school children but also in preschool age group including infants and toddlers less than 2 years of age.2,3 Because of the high incidence of adverse reactions associated with earlier heat killed and phenol preserved as well as acetone killed vaccine, it was discontinued from the NIP. Currently two types of typhoid vaccines are available-Vi antigen derived from polysaccharide capsule and the other one is in the form of enteric coated capsules for oral use. The Vi antigen vaccine is injectable, requires single dose and can be administered only after the age of two years since it is less immunogenic in infants.3 The oral vaccine is in the form of enteric coated capsules. Three doses are required to be given an alternate days. It can be given to children over 6 years of age and above because younger children cannot swallow the large capsules of the vaccine. Both vaccines are almost equally effective and require revaccination every 3-5 years. In view of high incidence of typhoid, its associated morbidity and mortality and problem of drug resistance; typhoid vaccination is strongly advocated. In our setting it should be started at 2 years of age with Vi antigen vaccine and at least one more dose be given at 5 years of age. However it is difficult to suggest up to which age revaccination should be continued; far the want of detailed epidemiological information.

The need for universal immunization of infants with Hepatitis B vaccine is quite well-established. India is moderately endemic for Hepatitis B infection with a carrier rate of 4.71%.4 Besides high mortality of acute cases, it is associated with serious sequelae in 20-40% like chronic hepatitis, cirrhosis and hepatic carcinoma in later years. Considering these facts and availability of a safe, effective and low cost vaccine, three doses of this vaccine should be administered to all infants, preferably starting the first dose within 12 hours of birth to prevent the development of carrier state in cases of perinatal transmission.

MMR is a combined vaccine for protection against measles, mumps and rubella. It is recommended to be given at 15-18 months of age. In view of occurrence of measles at a younger age in developing countries like India, measles vaccine is given at the age of 9-12 months instead of 12 months or later as in the developed countries. Even in a developed country like USA where first dose of measles vaccine is given as a part of MMR vaccine at 12-15 months, a second dose of measles vaccine is recommended at 4-6 years to overcome initial vaccine failures which though form a small fraction of vaccines, as well as to boost the falling titres of protective antibodies over a period of time.5

Rubella is a benign disease of childhood but has serious teratogenic effects in the baby if it occurs during pregnancy.
and thus vaccination against rubella is required to prevent these complications in the form of Congenital Rubella Syndrome. The rate of prenatal transmission is 40-50% overall and 90% during first twelve weeks of pregnancy. As about 40% women in reproductive age group in India are susceptible to rubella, vaccination against this is desirable.6

Mumps is a disease with negligible mortality but more complications occur if the disease occurs after puberty. Mumps being uncommon in children less than 12 months of age, all children beyond this age needs to be immunized.5

Thus a combined vaccine against measles, mumps and rubella available at a relatively low cost is a good option to be offered to all eligible children.

Haemophilus Influenza B is a common early childhood infection and has been firmly established as the leading cause of bacterial meningitis among infants and young children. It has also been recognized as the second leading cause of bacterial pneumonia deaths among children < 5 years of age. Studies show that Hib is responsible for 30-50% of confirmed bacterial meningitis cases in children. Preliminary data from 6 surveillance centers has shown that the case fatality ratio of Hib meningitis is 25%, 76% cases occur in infants and that 40-50% of isolates are resistant to first line antibiotics. Clinical trials of Hib conjugate vaccines have demonstrated that this vaccine can prevent 20-25% of radiologically confirmed pneumonia with consolidation.7

In number of hospital based studies in India, it has been seen Hib is generally the most common endemic cause of bacterial meningitis in children. The incidence of Hib meningitis in Vellore in 1996 was estimated to be 50-66 cases per 1,00,000 children<5 years of age. Similarly bacterial pneumonia is well known to be a leading killer of children in areas of India where infant mortality rates remain high.7 This data shows that Hib disease exists in India, and urgently needs addressing. Thus despite the relatively high cost of three primary and at least one booster dose, it is well justified to include the Hib vaccine in routine immunization schedule.

Hepatitis A is usually a mild disease with a case fatality ratio of 0.4%.8 Almost 90% of children in India are exposed to hepatitis A virus by the age of six years.8 Infection is mostly sub clinical if it occurs before the age of 16 years and virtually all children are infected with HAV by 15 years of age which provides them with a life long immunity. For protection against Hepatitis A two doses of vaccine are to be given six months apart each dose costing about 800 rupees each. Although the vaccine is highly effective, its high cost precludes its use by most of the families. Therefore parents must be informed about mild nature of the disease and given the option of vaccinating their children provided they can afford without compromising the other essential expenditure out of family budget.

Chicken Pox is another common disease and is mild with low mortality if occurs in childhood. Primary Varicella has a mortality rate of 2-3 per 1,00,000 cases with lowest case fatality rates among children 1-4 years and 5-9 years (approximately 1 death per 1,00,000 cases). The mortality rate of untreated primary infection in immuno compromised children is 7-14% and may approach 50% in adults. Most of the children are infected by the age of 15 years with fewer than 5% adults remaining susceptible.8 Disease is often severe if it occurs after adolescence or in adults. Natural infection provides life long immunity. A live attenuated highly effective vaccine is available and requires single dose to be administered if given before the age of 13 years. However the vaccine is costly as it costs about 1200 rupees per dose. Therefore in case of financial constraints parents may be given the option to get their child immunized if the child does not get the chicken pox infection by the age of 10 years. Others who can afford to pay and cannot afford even a minor illness to the child can exercise this option after completion of one year of age. However the vaccine must be recommended to household contacts of immuno compromised children. Adults who may frequently come in contact with cases of chickenpox e.g. health care providers at infectious disease hospitals and school staff may also get themselves immunized if they didn’t get chicken pox earlier.

Invasive meningococcal disease is most common in children with rates of more than 25/1, 00,000 populations in the first four months of life. Almost 50% cases occur in children less than 2 years of age.8 Meningococcal vaccine is a polysaccharide vaccine effective against meningococcemia as well as N. meningitides meningitis which have a high mortality rate. Major drawback with this vaccine is that it being a polysaccharide vaccine is poorly immunogenic in children less than two years of age, though its protein conjugate variant has been shown to be efficacious in infants.

Currently a quadrivalent vaccine is available which provides protection against A., C, Y and W135 strains. As one close variant has been shown to be efficacious in infants. Others who can afford to pay and cannot afford even a minor illness to the child can exercise this option after completion of one year of age. However the vaccine must be recommended to household contacts of immuno compromised children. Adults who may frequently come in contact with cases of chickenpox e.g. health care providers at infectious disease hospitals and school staff may also get themselves immunized if they didn’t get chicken pox earlier.

Therefore, it can be logically concluded that all the vaccines that are not available free of cost as under the National Immunization Programme and for which the parents have to pay for getting their child immunized should not be presented as absolutely essential. Their relative importance; cost and option in. terms of age up to which a child can wait for immunization must be clearly told to the parents, so as to help them decide keeping in view the family budget and its priorities.

Government along with concerned professional organizations should take an initiative for informing the general public as well as mobilizing practitioners for providing the required information while offering the vaccines not covered under National Immunization Schedule.
References


2. Sinha A, Sazawal S, Kumar F, Sood S, Reddiah VP et al. Typhoid fever in Children aged less than 5 years. Indian Council for Medical Research, Advanced Centre for Diarrhoeal Disease Research, Division of Pediatric Gastroenterology, New Delhi.


