

Measles immunization in Sri Lanka; should it be changed for the prevention of neurological complications?

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Measles is a highly contagious infection caused by a paramyxovirus. Acute measles infection may be followed by potentially devastating central nervous system complications. These include acute encephalitis, acute disseminated encephalomyelitis and subacute sclerosing panencephalitis (SSPE). SSPE is a fatal neuro-degenerative disorder and develops several years after the acute measles infection.

Neurological complications are the major cause for measles related morbidity and mortality. Even though, introduction of measles vaccination resulted in substantial reduction in incidence of measles and related complications, still considerable amounts of cases are reported from developing countries. And Sri Lanka experienced two major measles outbreaks in the recent past. Furthermore, increasing number of SSPE are also reported in our country.

Traditionally, measles vaccine was given as combined MMR vaccine (Measles, Mumps & Rubella) at the age of one year and three years in Sri Lanka. However, the measles outbreak in 2013 made health care authorities to reconsider the traditional practice and currently MMR vaccine is given at 9 month and three years. Supplementary immunization with measles vaccine was given during major outbreaks.

One can learn many lessons from the latest measles outbreak. Majority of the cases were infants below one year of age. Of those infants, around 40% were between 9 to 11 months of age and almost 30% were aged between 6 to 9 months¹. Even though, surveillance data on CNS complications of measles is lacking in our country, anecdotal evidence suggest those complications are on the rise.

It's plausible that substantial proportion of high risk infant less than 9 months are not protected by routine national immunization programme in Sri Lanka. It was thought that infants less than 9 months are protected by maternal immunity and vaccination before 9 months associated with increased numbers of vaccine failures. To the contrary, many studies suggested that at six months more than 90% of infants had lost the naturally acquired passive immunity from their mothers^{2,3}. In addition, malnourished children in developing countries like Sri Lanka tend to lose maternally acquired antibodies sooner than their economically advantaged counterparts and are prone to acquire many infections at an early age.

At the same time, several studies assessed the impact of measles vaccination before 9 months of age. Notably, a clinical trial in Guinea-Bissau revealed that measles vaccination in infants aged 4.5 months was safe and effective in producing adequate protective efficacy⁴. At 4.5 months merely 28% of enrolled infants had adequate level of maternal antibodies against measles. However, after early vaccination almost 92% had protective level of measles antibodies at 9 month of age. The number needed to treat to prevent single measles infection during 4.5 months to 9 months was 7.2. Furthermore, many developing countries recommend administering MMR vaccine to infants 6 months through 11 months of age before international travel. It's also advised that infants who are vaccinated with MMR vaccine before their first birthday should be revaccinated with two more doses at least 28 days later.

In conclusion, the current MMR vaccination schedule in Sri Lanka, leaves infants less than nine months vulnerable to develop measles infection. I strongly suggest health care authorities to revisit the recommended age of first MMR vaccination and consider vaccinating at earlier age in order to reduce the gap in window of susceptibility. Whether first dose of MMR vaccine should be followed with one more dose or two more doses require a multicenter randomized controlled trial. Vaccination before 9 months of age will have a definite impact on CNS complications, since infants who develop measles at an earlier age are more susceptible for post infectious complications such as SSPE.

References

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