

## **DPT and Local Massage**

*[Hsu C, Huang L, Lee, et al. Local massage after vaccination enhances the immunogenicity of diphtheria-tetanus-pertussis vaccine. Pediatr Infect Dis J 1995,14:567-571].*

The effects of local massage on adverse reactions and immunogenicity of diphtheria-tetanus-pertussis vaccine (DPT) was investigated. After DPT vaccination, 327 infants were either massaged or not, and adverse reactions were evaluated. Local pain and fever were more frequent in the massage groups. The extra febrile episodes from massage were mild (38-39°C). For evaluation of the antibody responses, 124 infants were recruited into massage or non-massage cohorts and antibody production was measured at 2, 6, 7, 18 and 19 months of age, respectively. Subjects in the massage group developed significantly higher antibodies against filamentous hemmagglutinin at 6 and 7 months of age, pertussis toxin at 6, 7, 18 and 19 months of age, pertussis agglutinin at 18 and 19 months of age and diphtheria toxoid at 6 and 7 months of age than those in the non-massage group ( $p=0.01$ ). Local massage after DPT vaccination was associated with better immunogenicity and more adverse reactions, including low grade fever and local pain, which were mild and not particularly disturbing.

### **Comments**

This study makes some interesting observations which are quite important and relevant to our routine immunization

practices because there are different views regarding local massage at the injection site following DPT vaccination. The primary aim of immunization is to protect a child from a disease and the immunization inputs are objectively measurable in terms of antibody levels. This aspect has been thoroughly evaluated by the study group and they have shown better immunogenicity in the group given local massage at injection site as far as diphtheria and pertussis are concerned. However, no difference was observed with regard to tetanus antitoxin values. It is also important to note that the kinetics of antibody response after DPT immunization in the massage group paralleled those in the non-massage group. The mean antibody titers increased steadily after primary immunization, fell thereafter (only diphtheria and pertussis) and was significantly boosted by the vaccine given at 18 months of age. Although both groups qualitatively shared the kinetics of antibody response to DPT in a similar way, quantitatively there was a significant difference. However, the authors have clearly mentioned that local massage may not be effective for every antigen. In this study also there was no augmentation of tetanus antitoxin by local massage.

The effect of local massage on the enhanced immunogenicity of DPT vaccine is related to presence of adjuvant in the vaccine which normally, holds the antigen at the injection site, delaying its adsorption and the subsequently released antigen behaves as a 'secondary immune stimulus'(1)-Local massage is likely to disperse the anti-genic mass rendering it more accessible to the immune system,

and thus lead to enhanced immunogenicity which amounts to giving a large dose of vaccine.

The safety of a vaccine is as important as its efficacy. Several studies in the past have attempted to unravel the severity of adverse reactions associated with DPT. Available evidence suggests that adverse reactions and immunogenicity could be affected by factors such as age, injection site and manufacturer. Apart from local induration, there may be other adverse effects like pseudotumor cerebri, convulsions and rarely even fatal consequences have been reported. This study has confirmed the belief that any manipulation which results in better immunogenicity will be associated with more adverse reactions. Therefore, before we visualize a definite advantage in achieving higher antibody levels with local massage we need to identify protective levels against all these infections and even the increased risk of adverse effects with a 'higher dose' of each component of the vaccine. Most of the adverse reactions are

related to pertussis component of the vaccine but even the protective levels of pertussis antibody are under debate(2). Thus the practical implication of an advantage of antibody titer higher than the protective titre needs to be evaluated particularly when we know that adverse reactions are as much related to giving a larger dose as the increase in immunogenicity(3). There is a definite need to carefully consider the immunological advantage, if any, versus risk of more adverse reactions.

#### REFERENCES

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