

Immunogenicity and Safety of DTPw-Hepatitis B Combined Vaccines

OM SINGH

*Senior Scientist and Head, Immuno-endocrinology Laboratory,
National Institute of Immunology, New Delhi 110 067, India.
E-mail: om@nii.res.in*

Hepatitis B virus infection is one of the major global health problems despite the availability of prophylactic vaccines. The WHO-Expanded Program on Immunization (WHO-EPI) recommends immunization of all infants against hepatitis B. The best way to achieve this goal of universal vaccination is by employing vaccine formulations combining the hepatitis B vaccine with the diphtheria, tetanus and whole-cell pertussis (DTPw) vaccine. The immunization schedule and adjuvant (aluminium salt) used in individual vaccine formulations are compatible. Studies have shown that hepatitis B component in the combined vaccine does not impair the immune responses to the other three components of the tetravalent vaccine, and the safety profile of the combined vaccine has been reported to be similar to that of the classical DTPw vaccine(1).

Integration of the combined vaccine into the routine immunization program should be a positive step towards protecting infants against hepatitis B virus. In this issue of the journal, Shah and colleagues(2) have compared the immunogenicity and safety of an indigenous DTPw-Hepatitis B combined vaccine (Shantetra™) with the Tritanrix HB™ vaccine in healthy Indian infants. They conclude that the present study has effectively demonstrated the safety and immunogenicity of Shantetra vaccine. Many clinical studies have shown the excellent immunogenicity of each component(1,3,4). However, the GMT antibody titers reported by Shah, *et al.*(2) are well below the previously published limits (see **Table I** for comparison), raising some concern. While upper confidence intervals compare well with the reported values, lower confidence interval for HBs

TABLE I COMPARATIVE IMMUNOGENICITY OF DTPW-HEPATITIS B COMBINED VACCINES

Study	Anti-HBs GMT (mIU/mL)	Anti-diphtheria GMT (IU/mL)	Anti-tetanus GMT (IU/mL)	Anti-pertussis GMT (EIU/mL)
Diez-Delgado, <i>et al.</i> (1)	2318 (1588-3384)*	3.59 (2.76-4.69)	5.76 (4.64-7.14)	189.3 (159.3-225.1)
Aristegui, <i>et al.</i> (3)	1526 (1273-1830)	2.10 (1.85-2.39)	4.98 (4.40-5.64)	134 (122-147)
Papaevangelou, <i>et al.</i> (4)	1175 (634-2178)	3.69 (2.62-5.19)	8.26 (5.99-11.38)	61 (47-79)
Shah, <i>et al.</i> (2) Shantetra™	473 (10-7036)	1.6 (0.1-3.8)	2.1 (0.4-9.2)	33.3 (21-417)
Shah, <i>et al.</i> (2) Tritanrix HB™	266 (10-1925)	1.5 (0.1-4.0)	1.9 (0.4-5.1)	39 (22-476)

*GMT= Geometric mean titers; * 95% confidence intervals*

and DT titers is the minimum threshold for protection against these diseases, and is at least 50-fold lower than the values reported by others. Even for TT, it is 10-fold lower. The result of this study should encourage further trials to answer this important question: Are some Indian infants poor responders to the combined vaccines?

Funding: None.

Competing interests: None stated.

REFERENCES

1. Diez-Delgado J, Dal-Ré R, Llorente M, González A, López J. Hepatitis B component does not interfere with the immune response to diphtheria, tetanus and whole-cell Bordetella pertussis components of a quadrivalent (DTPw-HB) vaccine: a controlled trial in healthy infants. *Vaccine* 1997; 15: 1418-1422.
2. Shah R, Raghu MB, Shivanada A, Mangayarkarasi S, Rao I, Rao R, *et al.* Immunogenicity and safety of an indigenously developed DTPw-Hepatitis B combination vaccine in Indian infants. *Indian Pediatr* 2008; 45: 819-823.
3. Aristegui J, Garrote E, Gonzalez A, Arrate JP, Perez A, Vandepapeliere P. Immune response to a combined hepatitis B, diphtheria, tetanus and whole-cell pertussis vaccine administered to infants at 2, 4 and 6 months of age. *Vaccine* 1997; 15: 7-9.
4. Papaevangelou G, Karvelis E, Alexiou D, Kiosoglou K, Roumeliotou A, Safary A, *et al.* Evaluation of a combined tetravalent diphtheria, tetanus, whole-cell pertussis and hepatitis B candidate vaccine administered to healthy infants according to a three-dose vaccination schedule. *Vaccine*. 1995; 13: 175-178.

Breakfast Eating Habit and School Performance: Compelling Associations in Need of a More Refined Analysis

GRAHAM F MOORE

*Researcher, Cardiff Institute of Society, Health and Ethics, School of Social Sciences,
Cardiff University, 53 Park Place, Cardiff CF10 3AT, UK.
E-mail: mooreg@cardiff.ac.uk*

The role of breakfast in improving school performance has recently received substantial attention in UK policy circles, as reflected by our work on the evaluation of the Primary School Free Breakfast Initiative in Wales (PSFBI)(1). Such efforts draw on a growing, yet inconsistent evidence base for associations between breakfast consumption and cognition(2). Many studies have drawn upon laboratory based work, examining acute impacts upon relatively abstract aspects of cognitive function(3, 4). Fewer studies have examined associations with tangible educational benefits such as performance in academic tasks, in real world settings. It is useful therefore to see a study by Gajre, *et al.*(5) in this issue of *Indian Pediatrics* paying attention not only to the role of breakfast in promoting acute cognitive improvements, but also

focusing upon outcomes such as school performance.

Gajre and colleagues' study(5) offers tentative evidence that breakfast eating habits are directly associated with acute cognitive functioning, as well as achievement in school subjects such as Maths and Science. Whilst these are interesting and important findings, and the authors should be commended for their efforts to investigate these relationships, a number of methodological and analytical limitations ought to be carefully considered when evaluating the article's conclusions.

Firstly, it is a touch unclear why the authors have chosen to examine Maths, Science and English marks separately without an *a priori* statement regarding the likelihood of breakfast differentially