Typhoid vaccination – Update

TWO 'NEW' TYPHOID VACCINES ARE NOW AVAILABLE FOR USE in Canada: an oral live attenuated vaccine (Vivotif Berna vaccine), manufactured from the Ty21a strain of *Salmonella typhi* by the Swiss Serum and Vaccine Institute; and a capsular polysaccharide vaccine (VICPS) for parenteral use (Typhim Vi) manufactured by Pasteur Mérieux (1). Several field trials conducted among indigenous children and adults in disease endemic areas have shown both vaccines to have an efficacy of approximately 70%, no better than that of the parenteral whole cell inactivated vaccine that is no longer available (2-5). However, the efficacy of these new vaccines has not been studied among persons from areas without endemic typhoid fever who travel to disease endemic regions. Both vaccines provide protective immunity within one week after completion of the recommended dose(s).

Adverse reactions are relatively low for both vaccines. Side effects with Ty21a are uncommon and consist mainly of gastrointestinal upset and rash or urticaria (6). In several trials VICPS produced fever in fewer than 1% of vaccinees, headache in 1.5 to 3% and erythema or induration of 1 cm or more at the injection site in 7% of vaccinees (5,7).

The choice of vaccine will depend on the age of the vaccinee, duration of protection, the underlying health status (ie, immunocompromised), the preferred route of administration and compliance issues. The oral vaccine is recommended for those six years of age and older, whereas VICPS may be given to children as young as two years. Booster doses for Ty21a are recommended every seven years compared with three years (two years in the United States) for VICPS. Since Ty21a is a live attenuated vaccine it is not recommended for pregnant women or immunocompromised persons. The only contraindication for VICPS is a history of severe local or systemic reactions following a previous dose.

Compliance and storage issues are a consideration for the oral vaccine since it is self-administered over eight days and must be refrigerated at all times. The vaccine should not be used if it has been exposed to temperatures above 26.8°C and/or sunlight. However, recent information from the manufacturer suggests that vaccine exposure to temperatures below 26.8°C for up to 48 h or freezing the vaccine by mistake will not reduce its potency. Ty21a should be administered 24 h or more after an antimicrobial agent and 8 h after mefloquine. Chloroquine does not appear to affect vaccine potency.

The development of two new vaccines for typhoid fever

has been a significant improvement over previous preparations because of longer duration of protection, the availability of an oral vaccine and the lower incidence of adverse reactions. These vaccines are indicated for travellers to endemic areas (particularly Asia, Africa and Latin America) who plan to live with family, stay for long periods (longer than one month) or who travel off the usual tourist routes, especially when access to safe food and water cannot be guaranteed (8,9). However, since neither vaccine is 100% protective, travellers must be cautioned about the need to take hygienic precautions with respect to food and drink. As a corollary, those who care for ill returning travellers must remember to consider typhoid fever in the differential diagnosis of febrile returned travellers even if they have been immunized against the infection.

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REFERENCES

1. Ivanoff B, Levine MM, Lambert PH. Vaccination against typhoid fever: present status. *Bull World Health Organ* 1994;72:957-71.
2. Levine MM, Ferreccio C, Black RE, Germanier R, Chilean Typhoid Committee. Large-scale field trial of Ty21a live oral typhoid vaccine in enteric-coated capsule formulation. *Lancet* 1987;329:1049-52.
3. Levine MM, Ferreccio C, Cryz S, Ortiz E. Comparison of enteric-coated capsules and liquid formulation of Ty21a typhoid vaccine in randomised controlled field trial. *Lancet* 1990;336:891-4.
4. Acharya IL, Lowe CU, Thapa R, et al. Prevention of typhoid fever in Nepal with the Vi capsular polysaccharide of *Salmonella typhi*. *N Engl J Med* 1987;317:1101-4.
5. Klugman KP, Gilbertson IT, Koornhof HJ, et al. Protective activity of Vi capsular polysaccharide vaccine against typhoid fever. *Lancet* 1987;330:1165-9.
6. Simanjuntak CH, Paleologo FP, Punjabi NH, et al. Oral immunisation against typhoid fever in Indonesia with Ty21a vaccine. *Lancet* 1991;338:1055-9.
7. Cumberland NS, Roberts JS, Arnold WSG, Patel RK, Bowker CH. Typhoid Vi: a less reactogenic vaccine. *J Int Med Res* 1992;20:247-53.
8. Ryan CA, Hargrett-Bean NT, Blake PA. *Salmonella typhi* infections in the United States, 1975-1984: increasing role of foreign travel. *Rev Infect Dis* 1989;11:1-8.
9. Typhoid immunization. Recommendations of the advisory committee on immunization practices (ACIP). *MMWR* 1994;43:1-7.