

Does the experience of diarrhoea among travellers vaccinated with whole cell/recombinant B-subunit oral cholera vaccine influence their willingness of being vaccinated again.

Eigil Gulliksen
Bryggeklippen, Oslo, Norway.

Gunnar Hasle
Reiseklinikken, Oslo Travel Clinic, Oslo, Norway.

Mone Tshahi Kildal
Oslo kommune, Oslo, Norway.

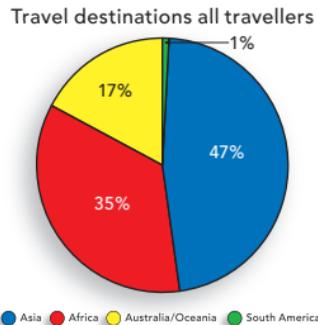
Lisa Olsson
SBL Vaccin AB, Stockholm, Sweden

Per Arne Parment
SBL Vaccin AB, Stockholm, Sweden

Diarrhoea is a common problem among travelers.^{1,2,3,4,5} The aetiology remains unknown in many cases, but the majority of the identified causal organisms are bacterial. Enterotoxigenic Escherichia coli (ETEC) is the most common pathogen responsible for 30 – 60 % of all travelers' diarrhoea, but with a great variation by seasons and geographic areas.^{6,7,8}

Presently, the only commercially available vaccine against travelers' diarrhoea caused by ETEC and cholera is the oral whole-cell/r-BS cholera vaccine (Dukoral®, in Norway Echoral®). As the cholera toxin and the heat-labile toxin (LT) of ETEC show an 80 % amino acid homology, the toxins cross-react immunologically^{9,10,11}. The oral whole-cell/r-BS cholera vaccine has been shown to have approx. a 60 % protective efficacy against LT-ETEC.^{12,13,14}

Dukoral®, has been marketed in Norway since 1997 for protection against cholera and LT-ETEC diarrhoea. In 2005 approximately 144 000 dose were sold. (Norway: 4.6 million population). As the vaccine has efficacy against cholera and ETEC, the vaccine will only protect the travelers exposed to these bacteria.



Take Dukoral again?

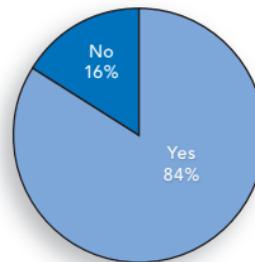
The ability of the travelers to value the vaccine, if they experience diarrhoea has been questioned, as the vaccine is reducing the risk for diarrhoea, but is not giving a total protection. This study was performed to establish if an experienced episode of diarrhoea did influence the traveler's decision to take the vaccine prior to a future journey.

The study was performed at 3 vaccination centers in metropolitan Oslo. Travelers, who had been recommended the oral whole-cell/r-BS cholera vaccine as a travel vaccine, were asked if they were willing to fill in a questionnaire after their return from their travel. Only travelers who had not used the vaccine previously were included in the study. In total 297 travellers answered the questionnaire. Among the travellers 32 % experience diarrhoea.

No definition of diarrhoea was given, as it is the participants' own concept of diarrhoea that is relevant for this study.

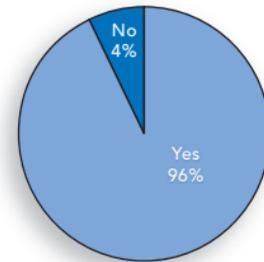
Of the diarrhoea cases only 12% stated that they were dissatisfied with the vaccine compared to 5 % among those who did not have diarrhoea.

Take Dukoral again.



The willingness to take Dukoral again among travellers who had experienced diarrhoea.

This study established that most customers are fully capable to value the information of diarrhoea risk reduction due to a vaccine, and that the experience of diarrhoea does not interfere with the trust of the vaccine, and consequently not with the trust in the vaccinator.



The willingness to take Dukoral again among travellers who did not experience diarrhoea

References:

- Evans MR, Shickle D, Morgan MZ. Travel illness in British package holiday tourists: prospective cohort study. *J Infect* 2001; 43:140-147.
- Saffari R, Tamaseparth N, Clemens SA, et al. Epidemiology of travellers' diarrhoea: details of a global survey. *J Travel Med* 2004; 11:212-237.
- Lima AAM. Tropical diarrhoea: new developments in travellers' diarrhoea. *Curr Opin Infect Dis* 2001; 14:547-552.
- Looke DF, Robson JM. Infections in the returned traveller. *Med J Aust* 2002; 177:212-219.
- Redman CA, MacLennan A, Wilson E, Walker E. Diarrhoea and respiratory symptoms among travellers to Asia, Africa, and South and Central America from Scotland. *J Travel Med* 2006; 13:203-11.
- Ostrosky-Zeichner L, Ericsson CD. Travellers' diarrhoea. In: *Principals and practice of travel medicine*. Ed JN Zuckerman. John Wiley & Sons Ltd Chichester 2001, p.153-163.
- Gascon J, Vargas M, Quito L et al. Enterotoxigenic Escherichia coli strains as a cause of traveler's diarrhea: a case-control study. *J Infect Dis* 1998; 177:1409-1412.
- Jiang Z, Lowe B, Venenkar M et al. Prevalence of enteric pathogens among international travelers with diarrhea acquired in Kenya (Mombasa), India (Goa), or Jamaica (Montego Bay). *J Infect Dis* 2002; 185:497-502.
- Clemens JD, Pinkalstein RA. Demonstration of shared and unique immunological determinants in enterotoxins from *Vibrio cholerae* and *Escherichia coli*. *Infect Immun* 1978; 22:709-713.
- Mosley SL, Falkow S. Nucleotide sequence homology between the heat labile enterotoxin gene of *Escherichia coli* and *Vibrio cholerae* deoxyribonucleic acid. *J Bacteriol* 1980; 144:444-446.
- Pierce NE. Protection against challenge with *Escherichia coli* heat labile enterotoxin by immunization of rats with cholera toxin toxoid. *Infect Immun* 1977; 18:338-341.
- Clemens JD, Sack DA, Harris JR et al. Crossprotection by B subunit whole cell cholera vaccine against diarrhea associated with heatlabile toxin-producing enterotoxigenic *Escherichia coli*. Results of a large-scale field trial. *J Infect Dis* 1988; 158:372-377.
- Paltola H, Sintonen A, Kyronseppä H et al. Prevention of travellers' diarrhea by oral-B-subunit/whole-cell cholera vaccine. *Lancet* 1991; 338:1285-1289.
- Scarpella EG, Sanchez JL, Mathewson JJ et al. Safety, immunogenicity, and protective efficacy of the whole-cell/recombinant B subunit (WC/RS) oral cholera vaccine against travellers' diarrhea. *J Travel Med* 1995; 2:22-27.