

Cholera vaccines. A brief summary of the March 2010 position paper

The WHO Position Paper on cholera vaccines that is published in the Weekly Epidemiological Record 26 March 2010 replaces the corresponding document published in April 2001. The new position paper updates information on cholera epidemiology, presents currently available cholera vaccines and the outcome of recent clinical trials. In addition, it describes the current WHO position on the use of cholera vaccines in endemic as well as in epidemic settings. The updated position paper also provides links to literature lists and to grading tables that assess the scientific strength of some key conclusions.

Cholera is a rapidly dehydrating diarrhoeal disease caused by ingestion of toxin-producing strains of serogroup O1, or less commonly, serogroup O139, of the bacterium *Vibrio cholerae*. The disease is spread mainly by faecal contamination of water and food and is closely linked to poor sanitation and lack of clean drinking water. All age groups may be affected. The actual global disease burden is estimated to be 3–5 million cases and 100 000–130 000 deaths per year. The emergence of more virulent strains of *V. cholerae* O1 in large parts of Africa and Asia and the spread of antibiotic-resistant mutants are causing concern.

Currently, only the oral cholera vaccines Dukoral^M and Shanchol^M/mORCVAX^M are available*. Dukoral is based on killed bacteria of serogroup O1 plus the cholera toxin B-subunit. (Toxin B induces short-term protection against enterotoxigenic *Escherichia coli* (ETEC), an important cause of travellers diarrhoea). Shanchol and mORCVAX are almost identical vaccines based on *V. cholera* O1 and O139, but without toxin B. Dukoral is widely available internationally, Shanchol is intended for both the Indian and international markets, whereas mORCVAX is currently intended for use in Viet Nam. These vaccines are all safe and induce adequate short-term protection (see below). The manufacturers recommend a primary series of two doses and, for those at continued risk of infection, a booster dose at intervals of about 2 years.

Earlier studies in Bangladesh showed that 4–6 months after vaccination, Dukoral provided 85% protection against cholera among individuals aged ≥ 2 years; in Mozambique, the field effectiveness was found to be 84% among people who had received 2 doses of Dukoral 1–6 months before the 2003–2004 cholera outbreak. ORCVAX was evaluated in Vietnam during an epidemic that occurred in Hue 8–10 months after the implementation of wide-spread cholera vaccination. In a controlled trial involving 334 000 individuals aged >1 year the vaccine efficacy after 2 doses was 66%. Since 2006, a Shanchol trial including 66 900 participants aged >1 year is ongoing in the slums of Kolkata, India. An interim analysis after 2 years showed that 2 vaccine doses induced an overall protective efficacy of 67% against confirmed cholera.

Shanchol and mORCVAX are licensed for use in individuals aged ≥ 1 year, Dukoral for individuals aged ≥ 2 years. Both vaccines require a cold chain. However, when compared with Dukoral, Shanchol and mORCVAX need less storage space and do not require a buffer or water for administration. Also, omission of the B-subunit makes Shanchol and mORCVAX less expensive to produce.

In cholera-endemic countries, vaccination should be used as an additional tool to control cholera and should be targeted at high-risk populations such as preschool- and school-aged children. Other groups that are especially vulnerable to severe disease such as pregnant women and HIV-infected individuals may also be targeted. Pre-emptive vaccination should be considered to help prevent potential outbreaks or the spread of current outbreaks. However, organizing appropriate treatment, improving water and sanitation, and mobilizing communities remain the mainstay of control measures during cholera epidemics.

*CVD 103-HgR, an oral, live, attenuated, single-dose vaccine, is no longer being produced. An injectable vaccine prepared from phenol-inactivated strains of *V. cholera* is still manufactured in a few countries, but its use has never been recommended by WHO.