1. Antecedents

Cholera is an acute secretory diarrhoea disease caused by intestinal infection with Vibrio cholerae. Its estimated cholera affects 3-5 million people with 100,000 dead each year, around the world. Infection is usually asymptomatic or mild, but sometimes can be severe. Approximately 5% of infected people develop severe cholera and without treatment, over 50% of people can die in a few hours. Cholera has probably existed on the Indian subcontinent for thousands of years. From 1817 cholera has caused seven important pandemics around the world, with thousands dead. The transmission happens when food and water are contaminated through the faeces of infect people. Complications of cholera are causative by the loss of fluids and electrolytes. Cholera’s treatment consists only of quickly oral fluid replacement. But as it happened in the past, cholera remains largely a disease of impoverishment, where sanitation water is inappropriate or absent, social unrest and displacement, and continues to be a disease of major public health concern.

2. Objective

The principal objective is develop a new oral cholera vaccine, which would gives more protection to prevent the disease of cholera, inducing strong immune response, than prequalification oral vaccines.

3. Methodology and work plan

A new oral recombinant vaccine was synthesized by outer membrane vesicles derived from V. Cholerae. The idea is to use a method that can present LPS-modified with CTB-modified and it gives protection against both clinically relevant serogroups. These vesicles consist of outer membrane lipids, a subset of outer membrane proteins and soluble periplasmic components (figure 4).

4. Expected results

- Vesicles, CTB-modified and LPS-modified, were produced correctly and no problems showed up.
- Results showed high levels of antibodies Anti-LPS O1 (Inaba and Ogawa), anti-LPS O139, anti-capular O139 and anti-CTB.
- All immunization groups induced a robust and long immune response with similar levels of IgG against both serogroups.
- The protective efficacy of anti-LPS antibodies is mediated either through vibriocidal activity or inhibition of adhesion to the epithelial surface.
- Only one dose was required and the protection was always 97% in mice.
- The vaccine shelf life was 5 years and storage temperature should be between 2-8°C. But the antigenicity of OMV is not significantly compromised after prolonged heating, the viability was 60 days.
- Price was unclear, but when large scale production takes place, prices will be cheaper than the other prequalified vaccines.

5. Benefits of the project

We need cholera vaccine because cholera is endemic in developing countries. Although the provision and establishment of safe water, food, and sanitation systems are the principal way to prevent cholera, these measures cannot be implemented in the near future in most areas where there is cholera. It’s known that V. cholerae shows increased resistance to antibiotics, complicating clinical management. These concerns and the improved protection of new-generation oral cholera vaccines have an important role in order to reduce cholera cases, alongside traditional cholera prevention measures.

6. Work diffusion

Regardless of whether the applicant group intends to publish the results in more impact journals in endemic areas, it’s expected that the above results could be useful for professional sectors companies or users.

7. Bibliography