Vaccine Against Eschericha coli 0157 Infection, Composed of Detoxified LPS Conjugated to Proteins

Published date: Feb. 1, 2012

Technology description

This invention is a conjugate vaccine to prevent infection by E. coli 0157:H7, particularly in young children under 5 years of age. E. coli 0157:H7 is an emerging human pathogen which causes a spectrum of illnesses with high morbidity and mortality, ranging from diarrhea to hemorrhagic colitis and hemolytic-uremic syndrome (HUS). Infection with E. coli 0157:H7 occurs as a result of consumption of water, vegetables, fruits or meat contaminated by feces from infected animals, such as cattle. The most recent large outbreak in the U.S. was from contaminated bag spinach. The conjugate is composed of the O-specific polysaccharide isolated from E. coli 0157, or other Shiga-toxin producing bacteria, conjugated to carrier proteins, such as non-toxic P. aeruginosa exotoxin A or Shiga toxin 1. A Phase I clinical trial, involving adult humans, showed the vaccine is safe and highly immunogenic. Adults, after one injection containing 25 µg of antigen, responded with high titers of bactericidal antibodies. Similarly in a phase II study, fifty 2-to-5- years old children in US were injected with the conjugate vaccines. There were only mild local adverse reactions. More than 90% children responded with greater than 10 fold rise of E. coli O157 antibodies of bactericidal ability. Thus the conjugates of the invention are promising vaccines, especially for children and the elderly, who are most likely to suffer serious consequences from infection.

Application area

Prevention of E. coli O157 infection

Institution

NIH - National Institutes of Health

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