Enhanced immune response by amphotericin B following NS1 protein prime-oral recombinant Salmonella vaccine boost vaccination protects mice from dengue virus challenge

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摘要

Abstract

A recombinant vaccine strain SL3261/pLT105 of attenuated aroA Salmonella enterica serovar Typhimurium SL3261 strain expressing a secreted dengue virus type 2 non-structural NS1 and Yersinia pestis F1 (Caf1) fusion protein, rNS1:Caf1, was generated. Immunological evaluation was performed by prime-boost vaccine regimen. Oral immunization of mice with 1 x 10(9)cfu of SL3261/pLT105 only induced low levels of NS1-specific antibody response and protective immunity following dengue virus challenge. The parenteral NS1 protein priming-oral Salmonella boosting protocol enhanced both NS1-specific serum IgG response and protective efficacy as compared to mice immunized with each type vaccine alone. Addition of an antifungal antibiotic amphotericin B (AmB) to Salmonella vaccine further enhanced the synergic effects of prime-boost vaccine regimen on the elicited NS1-specific serum IgG response and the protective efficacy. Together, the results demonstrated that the rNS1:Caf1 producing Salmonella SL3261/pLT105 strain fails to provide effective protection as an oral vaccine alone despite co-administration of AmB as an adjuvant capable of enhancing the immune responses, and moreover, the protein priming-oral Salmonella vaccine boosting approach in combination with AmB as an immunization regimen may have the potential to be further explored as an alternative approach for dengue vaccine development.

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