عنوان مقاله:

In silico Prediction of Pneumococcal truncated forms of Neuraminidase, A as Multivalent Pneumococcal Vaccine Antigens

محل انتشار:

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خلاصه مقاله:

Introduction and Objectives: Streptococcus pneumoniae is the most frequent cause of bacterial meningitis in children and is particularly associated with severe disease with a high mortality rate and brain damage leading to neurological sequela. All currently available polysaccharide-based pneumococcal vaccines have limitations and elicit only serotype-specific immunity. Alternative technology is the use of pneumococcal proteins for producing independent serotype-based vaccines. Pneumococcus has several proteins that are well-conserved among different serotypes, are surface-displayed and thus antibody accessible. One of them is neuraminidase A (NanA) that has important role in nasopharyngeal colonization of pneumococcus, acute otitis media and pneumococcal meningitis. Since after innate immune responses, humoral immune system has key defensive role in nasal and salivary mucosal sites against pneumococcal infection. Materials and Methods: thus, we used in-silico methods for predicting continuous antibody epitopes from NanA protein sequence. Using Immune Epitope Database(http://tools.iedb.org/bcell/), six prediction including bepipred linear epitope, Chou & Fasman beta-turn, Emini surface accessibility, Karplus & Schulz flexibility, Kolaskar & Tongaonkar antigenicity and Parker hydrophilicity prediction were performed. We divided the NanA amino acids sequence to four truncated forms and investigated above parameters for each truncated forms. Results: Our results were shown that according to analysis of linear epitope scores, the truncated forms of NanA (amino acids 1 to 258 and 776 to 1035) had the highest scores. Results of flexibility, surface accessibility, beta-turn and antigenicity analysis showed the truncated forms of NanA (amino acids 259 to 517 and 518 to 775) had the highest scores and analysis of hydrophilicity showed the highest score for the truncated form of NanA (amino acids 776 to 1035). Conclusion: According to results, we can use two or three truncated forms of NanA to design multivalent pneumococcal vaccines. In future we will design fusion truncated forms of NanA with other pneumococcal proteins .and will investigate in-vivo immunogenicity of these truncated forms

کلمات کلیدی:

.Neuraminidase A, Streptococcus pneumoniae, Multivalent Pneumococcal Vaccine, Iran