In silico evaluation and prediction of intra/inter-species relationships & properties of antigenic region 4 of HA protein of swine influenza H1N1 virus in Iran in order to present a proper candidate for vaccine

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Abstract: Four antigenic regions exist on the globular domain of hemagglutinin (HA) surface antigen that amino acids substitutions caused by point mutations in these regions have been intensified [1]. The purpose of this study was in- silico evaluation and prediction of intra/inter-species relationships and properties of antigenic region 4 of HA protein of swine influenza H1N1 virus in Iran in order to present a proper candidate for protective vaccine against this virus. In this study, the software based investigations on the genomic region of antigenic segment 4 of HA protein of swine influenza H1N1 virus in Iran and the evaluation of specific intra/inter-species relationships in this hydrophilic region as well as the prediction of antigenic sites of it, were done. The genomic sequence of antigenic segment HA protein gene of swine influenza H1N1 virus is 1701 bp. By using the Bio-Edit software, we evaluated the sequence similarity between the other 25 species and the accordance as well as the entropy of them was calculated. The data obtained from the bioinformatics studies showed that there are many similarities between segment 4 of H1N1 virus isolated from Iran and segment 4 of H1N1 virus isolated from Kerala, Sydney, Qingdao, Egypt, Bangkok and England.In this research, the study of antigenic segment 4 HA protein gene of swine influenza H1N1 virus and phylogenetic analysis of it, showed that the strain isolated from Iran have many similarities as compared with the strain isolated from the countries that mentioned above and the basis of done predictions, production of a protective vaccine against each of these strains can be effective against the other one. Therefore, it can be designed, an effective and efficient vaccine against this virus, in view of obtained information.

Keywords: Influenza A Virus; H1N1 Subtype; vaccine; interspecies relationship; Bioinformatics study

References

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