عنوان مقاله:

Immunogenicity assessment of high-risk human papillomavirus L1 capsid proteins: A bioinformatics approach

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خلاصه مقاله:

Background and aim: Cervical cancer, the second most common malignancy in women worldwide, is regularly associated with high-risk human papillomavirus (hrHPV) infections. The HPV genome is packaged within a non-enveloped, icosahedral capsid composed of 72 pentamers of the major capsid late protein (L1) and an unknown number of the minor capsid proteins L2. Each HPV type has unique specificity for infection of skin or mucosa. At present, two prophylactic vaccines have been designed to prevent HPV infections. The licensed HPV vaccines focus only the two types most frequently found in cervical cancer, HPV16 and HPV18 that cause 70% of cases. The aim of this study is to find immunodominant and conserved epitopes of L1 protein among four common HPV types in Iranian populations using bioinformatics tools.Material and methods: The full sequences of four hrHPV L1 proteins were obtained from PaVE database. The protein sequence sets were aligned using MUltiple Sequence Comparison by Log Expectation, MUSCLE. The MHCI/II binding and processing (Proteasomal cleavage and TAP transport) scores of conserved peptide regions were analyzed by IEDB, NetMHC 4.0 and Rankpep online servers. Finally, MHCI/II-Peptide flexible Molecular docking was performed in selected regions using CABS-dock server.Results: Immunogenicity, MHCI/II affinity levels, proteasomal cleavage, TAP transport and MHCI/II-Peptide flexible molecular docking of conserved domains was calculated. We found the conserved immunogenic epitope of hrHPV L1 proteins can be used in next generation prophylactic vaccines.Discussion: Immunogenicity analysis of four hrHPV L1 proteins could provide information for understanding the immunogenic domains and their roles in interactions of viruses with the immune systems. Moreover, the conserved peptide epitopes can be used for development of vaccines targeting several HPV types in future.

کلمات کلیدی:

HPV, Cervical cancer, Bioinformatic analysis, Immunodominant epitopes

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