

Enhancement of HPV Therapeutic Peptide-based Vaccine Efficacy through Combination Therapies and Improved Delivery Strategies: A Review

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Statement of the Problem: The development of therapeutic vaccines against HPV-positive tumors is crucial for protecting individuals already infected with HPV, preventing tumor progression, and effectively treating the disease. However, HPV therapeutic peptide-based vaccines typically lack immunogenicity and frequently fail to induce effective immune responses. Therefore, there is a need for more effective approaches to improve the immunogenicity of HPV peptide-based vaccines. The purpose of this study is to describe relevant research and possible uses for increasing the immunogenicity and therapeutic efficacy of HPV peptide-based vaccines through combined therapy and improved delivery strategies. Methodology & Theoretical Orientation: To locate all publications published prior to June 2024 and ongoing clinical trials registered before June 2024, we performed searches in PubMed, Cochrane, Embase, and U.S. ClinicalTrials.gov. The search parameters included all terms associated with “HPV peptide vaccines”, “therapeutic HPV vaccines”, and “HPV-related tumors”. Findings: It has been observed that addressing HLA-type restrictions enables the selection of safe and effective CTL epitope peptides tailored to diverse populations, thereby mitigating their low immunogenicity. In addition, appropriate adjuvants can augment the immune effects. The combination of ICI with HPV therapeutic peptide-based vaccines has shown promising results in clinical trials. Furthermore, altering delivery strategies using techniques such as PCI technology, nanoparticle delivery systems, and bacterial secretion vesicle delivery may enhance the efficacy of HPV therapeutic peptide vaccines. The co-administration of traditional Chinese medicine extracts and TLR receptor agonists as adjuvants, or the combination of CarboTaxol chemotherapy or imiquimod, has been shown to enhance the immune response generated by therapeutic peptide vaccines targeting HPV. Conclusion & Significance: Compared with traditional therapies, the combination of therapy and alterations in delivery strategies confer significant advantages and feasibility to HPV therapeutic peptide vaccines, with broad prospects for development..

Biography

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