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Gene therapy in the management of oral cancer: a review of recent developments.

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Abstract

AIMS:

This article reviews the present body of knowledge regarding the principle, transfer techniques, therapeutic strategies, clinical applications and limitations of gene therapy in the management of oral squamous cell carcinoma.

MATERIALS AND METHODS:

Scientific publications on gene therapy between 1990 and 2003 were selected for the purpose of the review. These include clinical articles, experimental studies and review articles.

RESULTS:

Viruses are the commonly used transfer system for the delivery of gene therapy. The viral vectors commonly used are: retroviruses, adenoviruses, herpesviruses, and adenoassociated viruses (AAV). Transfection of cancer cells in vivo with gene therapy is done by intralesional injection, and sometimes by topical application. Phase I and II clinical trials have established the safety and clinical efficacy of gene therapy in the treatment of oral squamous cell carcinomas in humans, especially in combination with chemotherapy or radiotherapy. Phase III clinical trials and studies of the use of gene therapy as an adjuvant following surgery are presently underway.

CONCLUSIONS:

Gene therapy represents a new and innovative approach to the treatment of oral cancer especially in recurrent disease and adjuvant treatment. Oral squamous cell carcinoma is especially an attractive tumour target due to its frequent genetic mutations and accessibility for intra-tumoural administration of gene therapy. However, gene therapy has not yet been shown to be suitable for systemic delivery in cancer patients, hence the control of regional and metastasis is presently difficult.