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[Intervention Review]

Amifostine for salivary glands in high-dose radioactive iodine treated differentiated thyroid cancer

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ABSTRACT

Background

Radioactive iodine treatment for differentiated thyroid cancer possibly results in xerostomia. Amifostine has been used to prevent the effects of irradiation to salivary glands. To date, the effects of amifostine on salivary glands in radioactive iodine treated differentiated thyroid cancer remain uncertain.

Objectives

To assess the effects of amifostine on salivary glands in high-dose radioactive iodine treated differentiated thyroid cancer.

Search methods

Studies were obtained from computerized searches of MEDLINE, EMBASE, *The Cochrane Library* and paper collections of conferences held in Chinese.

Selection criteria

Randomised controlled clinical trials and quasi-randomised controlled clinical trials comparing the effects of amifostine on salivary glands after radioactive iodine treatment for differentiated thyroid cancer with placebo and a duration of follow up of at least three months.

Data collection and analysis

Two authors independently assessed risk of bias and extracted data.

Main results

Two trials with 130 patients (67 and 63 patients randomised to intervention versus control) were included. Both studies had a low risk of bias. Amifostine versus placebo showed no statistically significant differences in the incidence of xerostomia (130 patients, two studies), the decrease of scintigraphically measured uptake of technetium-99m by salivary or submandibular glands at twelve months (80 patients, one study), and the reduction of blood pressure (130 patients, two studies). Two patients in one study collapsed after initiation of amifostine therapy and had to be treated by withdrawing the infusion and volume substitution. Both patients recovered without sequelae. Meta-analysis was not performed on the function of salivary glands measured by technetium-99m scintigraphy at three months after high dose radioactive iodine treatment due to the highly inconsistent findings across studies (I^2 statistic 99%). None of the included trials investigated death from any cause, morbidity, health-related quality of life or costs.

Authors' conclusions

Results from two randomised controlled clinical trials suggest that the amifostine has no significant radioprotective effects on salivary glands in high-dose radioactive iodine treated differentiated thyroid cancer patients. Moreover, no health-related quality of life and other patient-oriented outcomes were evaluated in the two included trials. Randomised controlled clinical trials with low risk of bias investigating patient-oriented outcomes are needed to guide treatment choice.

PLAIN LANGUAGE SUMMARY

Amifostine for salivary glands in high-dose radioactive iodine treated differentiated thyroid cancer

Thyroid cancer is the most common malignancy of the endocrine system consisting of several subtypes like papillary carcinoma (accounting for 80% of cases) and follicular carcinoma (accounting for 11% of cases). These are collectively referred to as 'differentiated thyroid cancer'. Treatment with radioactive iodine after surgery (ablation of the thyroid gland or 'thyroidectomy') is important for the detection of metastatic disease and for the destruction of the remaining thyroid tissue with microscopic cancer. After radioactive iodine treatment, adverse effects may happen in the salivary glands and cause salivary gland swelling and pain, usually involving the parotid. The symptoms may develop immediately after a therapeutic dose of radioactive iodine or months later and progress in intensity with time. Secondary complications reported include dry mouth ('xerostomia') and taste alterations.

Amifostine is thought to be a radioprotector of salivary glands used in conjunction with radioiodine therapy. This medication is administered intravenously and was reported to ameliorate the damage of salivary glands caused by radioactive iodine therapy.

We found only two randomised controlled trials in which the effects of amifostine were compared with placebo. The two randomised clinical trials investigated 130 patients treated with high dose radioactive iodine for thyroid cancer. Altogether data from the two trials suggest that amifostine has no obvious protective effects on the salivary glands in these patients. Two patients in one study collapsed after initiation of amifostine therapy and had to be treated by withdrawing the infusion and volume substitution. Both patients recovered without sequelae.

Until better data become available, the use of sour candy or lemon juice to increase salivation might be more appropriate during radioactive iodine treatment for patients with differentiated thyroid cancer. Patients should be well informed of the importance of hydration, acid stimulation and glandular massage after radioactive iodine treatment. In addition, early recognition and treatment of xerostomia may improve outcomes.