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Original article

Combined concomitant boost radiotherapy and chemotherapy in stage III–IV head and neck carcinomas: A comparison of toxicity and treatment results with those observed after radiotherapy alone

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Summary

Background: Alteration of radiation therapy (RT) fractionation and the combination of chemotherapy (CT) with RT represent two predominant fields of current research in the treatment of head and neck carcinomas. To assess the potential integration of these two fields, a retrospective comparison of toxicity and treatment outcome was carried out in stage III–IV patients treated with a concomitant boost RT schedule with or without CT.

Patients and methods: Fifty-two patients were treated by RT alone and 35 by RT and CT. In the RT group, there were significantly fewer T3–4 tumors (56% vs. 88%, $P = 0.002$) and higher proportion of planned neck dissections (35% vs. 14%, $P = 0.047$). The planned total dose was 69.9 Gy delivered over 5.5 weeks. In 10 cases CT was given before RT and in 25 concomitantly with RT, either alone or with neoadjuvant and/or adjuvant CT. All patients but two had cisplatin-based (CDDP, 100 mg/m^2) CT, associated in 28 patients with 5-fluorouracil (5-FU, 1000 mg/m^2/24 h × 5). The median follow-up for the surviving patients was 21 and 31 months for the RT and RT–CT groups respectively.

Results: Grade 3–4 acute toxicity (RTOG) was observed in 73% and 86% of patients, and grade 3 dysphagia in 31% and 57% ($P = 0.02$) respectively in the RT and RT–CT groups. The rates of grade 3–4 late complications were similar in the two groups (5% vs. 12%). At three years, actuarial loco-regional control (LRC) was 57% and 66% ($P = 0.66$) and overall survival was 56% and 47% ($P = 0.99$) in the RT and RT–CT groups respectively.

Conclusions: While acute toxicity was higher compared with RT alone, this accelerated RT schedule was feasible in association with 5-FU/CDDP, even administered concomitantly. Despite the significant proportion of more advanced disease in the RT–CT group, LRC was similar to that obtained by RT alone. Combinations of concomitant boost RT and chemotherapy merit further investigation in prospective trials.

Key words: accelerated radiotherapy, chemotherapy, head and neck cancer

Introduction

The prognosis of patients with advanced head and neck carcinomas treated by standard radiation therapy (RT) is generally very unfavorable [1–3]. Both the use of unconventional fractionation schedules and the adjunction of chemotherapy to RT are undergoing investigation in the hope of improving these unsatisfactory results [4–17]. The encouraging initial results of the concomitant boost technique [9, 18] led in 1991 to the introduction at the University Hospital of Geneva of a modified concomitant boost schedule in which the boost to the clinically involved sites was delivered in a progressively accelerated fashion during the last 3.5 weeks of a 5.5 week treatment course. For stage III–IV disease, chemotherapy was initially added sequentially prior to RT and then progressively more frequently in a concomitant fashion. In order to establish whether or not a concomitant boost schedule is compatible with the simultaneous administration of chemotherapy, the therapeutic outcome and toxicity of the combined treatment have been retrospectively analyzed and compared with those obtained in a group of patients treated during the same period with the identical RT regimen but without chemotherapy.

Patients and methods

Patients

From January 1991 to October 1995, 87 patients with resectable or unresectable stage III–IV head and neck carcinomas were treated with concomitant boost RT, of whom 35 (40%) received combined chemoradiotherapy. Compared with patients treated with radiotherapy alone (RT group), those receiving chemotherapy (RT–CT group) tended to have bulkier disease. The characteristics of the two groups of patients are given in Table 1.

Radiation therapy

The treatment schedule planned to deliver a total dose of 69.9 Gy in 41 fractions over a period of 38 days. The basic course, including all involved sites and areas of potential microscopic disease (generally the primary tumor area and both sides of the neck down to the clavicles), was given in daily fractions of 1.8 Gy, five times a week to a total dose