

Rapid Communication

Assessment of Gaps or Treatment Interruptions of Head and Neck Squamous Cell Carcinoma Patients Undergoing Radical Chemo Radiotherapy

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Abstract

Treatment interruption or break plays an important factor in the treatment outcome of patients undergoing radical chemoradiotherapy for Locally Advanced Head and Neck Squamous Cell Carcinoma (LA-HNSCC). It is postulated that the increase in Overall Treatment Time (OTT) leads to fast repopulation of resistant cells which results in poorer outcome. In this study we assessed the occurrence of treatment breaks and its impact on outcome amongst our patients of LA-HNSCC.

Introduction

The treatment of Locally Advanced Head and Neck Squamous Cell Carcinoma (LA-HNSCC) of sites like oropharynx, larynx and hypopharynx is radical concurrent chemotherapy and radiotherapy [1]. The radiotherapy treatment requires 35 days of treatment over 7 weeks. Due to certain reasons like bone marrow suppression, severe mucositis, nutritional requirements and generalized weakness, some patients undergo breaks or interruptions during their radiotherapy treatment leading to an increase in Overall Treatment Time (OTT). Interruptions during radiotherapy of HNSCC have been shown to be correlated with poorer outcome as compared to patients with no interruptions [2,3]. The aim of this study is to find out the prevalence and impact of gaps/ interruptions during radiotherapy treatment of LA-HNSCC patients. The secondary endpoint would be to analyze the clinical factors which are associated with treatment interruptions.

Material and Methods

This retrospective study was done on 150 diagnosed patients of biopsy proven LA-HNSCC (Stage III and IVA) who were treated with concurrent chemotherapy and radiotherapy (after multidisciplinary tumor board approval).

Radiotherapy was delivered to a dose of 70Gy in 35 fractions over 7 weeks using Intensity Modulated Radiotherapy (IMRT) or Image Guided Radiotherapy (IGRT) on Medical Linear Accelerator.

The treatment data was reviewed to analyze the interruptions during treatment. This was then correlated to assess the impact on treatment outcome. Various clinical parameters were analyzed in patients with treatment interruptions like age, tumor stage and subsite.

Results

Among 150 patients, the average interruption during treatment was 3.8 days. Among patients with treatment interruptions, it was observed that males, elderly patients (aged more than 70 years) and patients with oropharyngeal primary had higher occurrence of treatment breaks. There was a large difference in the mean interruptions in terms of staging. Patients with Stage III disease had a mean gap of 2.7 days as compared to 4.2 days in patients with stage IVA disease (p value<0.05).

For the sake of interpretation, we divided 150 patients based on the duration of treatment interruption. Group A: interrup-

tion of less than 3 days while Group B: interruption of more than 3 days.

We found an impact on complete response achieved due to treatment interruption. Patients in Group A had complete response in 53/90 patients (58.8%) whereas in Group B it was 21/60 patients (35%) which was statistically significant (p value < 0.05).

Patients who had multiple interruptions had a worse toxicity profile in terms of mucositis, skin reactions or bone marrow suppression. At the same time, such patients had a higher rate of nasogastric tube insertion in order to maintain the nutritional requirements of the patient.

Discussion

The importance of delays during a course of radiotherapy has been emphasized in recent decades and different recommendations on the delay-compensation options have been published [4]. Fast tumor cell repopulation has been suggested as the main reason why prolonging Overall Treatment Time (OTT) negatively affects Local Control (LC) and Overall Survival (OS) in many human tumors [5].

Treatment interruption can be due to many reasons. It may be due medical (physician decision) or non-medical reasons (patient related factors). Some treatment interruptions are necessary in view of general condition of the patient, tolerability to treatment and nutritional needs. However certain interruptions can be avoided which may have been initiated by the patient or the patient defaulted. The reason for treatment interruptions were not analyzed in this study.

There have been multiple studies in head and neck cancer that show the impact of treatment interruption on outcome [6-8]. Delays in RT may result in an average loss of Local Regional Control (LRC) ranging from as low as 1.2% per day to as high as 12–14% per week. At the same time a daily dose increase of about 0.6–0.8 Gy/day would be required to compensate for the extra time occurring during the prolonged OTT [8].

Conclusion

Radiotherapy interruption can have varying degrees of impact on patient outcomes, and the possibility of such interruptions should be minimized in actual clinical practice. Necessary steps are needed to be taken in order to prevent it. When radiotherapy interruptions cannot be prevented, necessary dosimetric corrections should be done in order to not over exceed the overall treatment time.

References

1. Anderson G, Ebadi M, Vo K, Novak J, Govindarajan A, et al. An Updated Review on Head and Neck Cancer Treatment with Radiation Therapy. *Cancers (Basel)*. 2021; 13: 4912.
2. Alden ME, O'Reilly RC, Topham A, Lowry LD, Brodovsky H, et al. Elapsed radiation therapy treatment time as a predictor of survival in patients with advanced head and neck cancer who receive chemotherapy and radiation therapy. *Radiology*. 1996; 201: 675-680.
3. Barton MB, Keane TJ, Gadalla T, Maki E. The effect of treatment time and treatment interruption on tumour control following radical radiotherapy of laryngeal cancer. *Radiother Oncol*. 1992; 23: 137-143.
4. Dale RG, Hendry JH, Jones B, Robertson AG, Deehan C, et al. Practical methods for compensating for missed treatment days in radiotherapy, with particular reference to head and neck schedules. *Clin Oncol (R Coll Radiol)*. 2002; 14: 382-393.
5. Tubiana M. Repopulation in human tumors. A biological background for fractionation in radiotherapy. *Acta Oncol*. 1988; 27: 83-88.
6. Thomas K, Martin T, Gao A, Ahn C, Wilhelm H, et al. Interruptions of Head and Neck Radiotherapy Across Insured and Indigent Patient Populations. *J Oncol Pract*. 2017; 13: e319-e328.
7. Dey T, Gupta A, Ballari NR, Ghoshal S, Datta A. Unscheduled treatment breaks during radical radiotherapy for head and neck cancers: An audit from a tertiary care center. *Bengal J Cancer*. 2021; 1: 66-71.
8. González Ferreira JA, Jaén Olasolo J, Azinovic I, Jeremic B. Effect of radiotherapy delay in overall treatment time on local control and survival in head and neck cancer: Review of the literature. *Rep Pract Oncol Radiother*. 2015; 20: 328-339.