Research Article

Comparison of cisplatin-based combination chemotherapy with carboplatin-based combination chemotherapy in oral and pharyngeal cancers: an observatory pilot study

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Abstract

Background: Oral and pharyngeal cancers are one of the most prevalent category of cancers worldwide. These kinds of cancers are associated with poor outcomes in terms of quality of life and mortality. The main modality of treatment is chemotherapy, and combination therapy based on cisplatin is commonly used. Cisplatin is associated with severe side effects, and there are some studies that revealed that carboplatin can be a good alternative to cisplatin.

Objective: To compare cisplatin-based chemotherapy with carboplatin-based combination therapy in grades III and IV oral cancers.

Materials and Methods: This is an observational study based on the patients of a tertiary-care center. The subjects were categorized into two groups based on the treatment regimen prescribed to them. Group I was administered intravenous (IV) paclitaxel (175 mg/m^2) and IV cisplatin (70 mg/m^2) on day 1 and IV 5-fluorouracil (FU; 1,200 mg/m^2) from days 2 to 4. This regimen was repeated after 21 days. A total of six cycles were completed. Group 2 was administered IV paclitaxel (175 mg/m^2) on day 1, IV carboplatin (dose calculated on AUC), and IV 5-FU (1,200 mg/m^2) from days 2 to 4. This regimen was repeated after 21 days, and such six such cycles were completed. Both the groups were compared for recovery and adverse effects after the completion of the study period.

Result: There was no significant difference in recovery between both the groups ($p = 0.56$, $\chi^2 = 1.12$, $df = 2$). Adverse effects were more in the cisplatin group when compared with those in the carboplatin group. The most common adverse effects were nausea and vomiting, mucositis, and renal complications.

Conclusion: There is no significant difference in efficacy between cisplatin and carboplatin, but carboplatin is safe when compared with cisplatin. Small sample size and observatory nature of the study are the serious limitations for interpretation of these results.

KEY WORDS: Cisplatin, carboplatin, oral cancer, pharyngeal cancer

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Introduction

Oral and pharyngeal cancers are one of the most common cancers as per the global burden of disease.[1] In the United States, 2.3% of all cancers are oral cancers, and such type of cancers are associated with less than 5-year survival rate.[2] The prevalence of oral cancer in India is between 1% and 2%, and the occurrence of such cancers in the Indian population is

a decade early when compared with the western population.[3,4] Oral cancers are treated by chemotherapy depending on the stage of the cancer. Chemotherapy in oral cancer is utilized in different clinical settings, that is, in recurrent or metastatic disease, neoadjuvant or adjuvant with standard therapy of surgery, and/or radiotherapy or combined chemoradiotherapy with an intention to cure. In case of local recurrence, distant metastasis, and residual disease, palliation is given either as a single agent or as a combination of chemotherapy.

Chemotherapy has been added to the standard therapy in recent years in order to improve the curability of advanced lesions. Combination chemotherapy regimens prove to be superior in terms of overall response.[5] Cisplatin and 5-fluorouracil (FU) with or without other drugs in oral cancer remain to be the most preferred regimen.[5] Carboplatin can be used in the place of cisplatin in the combined regimen, and as per some studies, it has favorable toxicity profile when compared with cisplatin.[6] In some other studies, cisplatin was found to exhibit superior efficacy and safety when compared with carboplatin.[7]

There is scarcity of literature on head-to-head comparison of cisplatin vs. carboplatin in oral cancer, and such study is not available for the Indian patients with oral cancer; hence, this study was designed with the aim of comparing combination regimen including cisplatin vs. carboplatin for the treatment of oral cancers.

Materials and Methods

This is an observational study carried out at the government teaching hospital at CIMS, Bilaspur, Chhattisgarh, from August 2014 to May 2015 in the newly started cancer unit. Permission from Institutional Ethics Committee was taken before starting the study. Patients who came to the institute for the treatment of oral cancer of stages III and IV were included in this study. A total of 35 consecutive patients were observed (19 in group 1 and 16 in group 2). On the basis of the regimen started by the treating clinician, all the subjects were categorized into two groups. Group I was administered intravenous (IV) paclitaxel (175 mg/m^2) and IV cisplatin (70 mg/m^2) on day 1 and IV 5-FU (1,200 mg/m^2) from day 2 to 4. This regimen was repeated after 21 days. A total of six cycles were completed. Group 2 was administered IV paclitaxel (175 mg/m^2) on day 1, IV carboplatin (dose calculated on AUC), and IV 5-FU (1,200 mg/m^2) from days 2 to 4. This regimen was repeated after 21 days, and six such cycles were completed.

Before starting chemotherapy, all the patients underwent clinical, routine laboratory, histopathological, and radiological examinations. These tests were done periodically till the completion of the study. Information of the study subjects and the relevant parameters were recorded on semistructured pro forma. At the end of the study, all the study subjects were characterized showing complete response, partial response, or no response based on AJCC (American Joint Committee for Cancer) response criteria.[8] All the adverse effects of grades III and IV observed in the patients were evaluated for causality.

Statistical Analysis

Descriptive statistics were reported in the form of frequency and percentages. The response rate was compared between both the groups (regimens 1 and 2) by χ^2-test. The p value < 0.05 was considered significant. Open source statistical analysis software, Open Epi (http://www.openepi.com/Menu/OE_Menu.htm) was used for analysis.

Result

In regimen 1, complete response was observed in six (31.76%) subjects, partial response in 12 (63.15%) subjects, and no response in one (5.26%) subject, while in regimen 2, it was three (18.75%), 11 (68.75%), and two (12.5%) subjects, respectively ($p = 0.56$, $\chi^2 = 1.12$, $df = 2$) [Table 1]. Side effects such as renal complications, nausea/vomiting, and mucositis were more frequent in regimen 1 when compared with regimen 2 [Figure 1].

Discussion

This observation study was designed with the primary aim of comparing the efficacy and safety of cisplatin and carboplatin in patients with oral cancers, and it was observed that there was no significant difference in the efficacy between both the drugs, but there was an increase in the adverse effects in the cisplatin group when compared with the carboplatin group.

The results obtained in this study are not congruent to the results of some other studies done by different study designs but with the same objectives. In a retrospective study done by Rades et al.,[7]it was observed that the 3-year locoregional control and overall survival were better in cisplatin when compared with carboplatin. There was no significant difference in toxicity. When compared with this study, our study showed less sample size and less rigorous design, which may be the reason for no significant difference. In the study by Rades et al.,[7] multivariate method was used for analysis, which negate any other factors that may contribute to the difference; but it was not done in our study because of less sample size. The side effect profile of carboplatin is favorable when compared with the cisplatin, and the findings observed in our study was also supported by some other observations.[9]

This is the first study based on the combination regimen comparing cisplatin and carboplatin in Indian patients, and this is a prospective observational study based on the routine treatment of patients in tertiary-care center. As this is not a clinical trial, and sample size is less, the results obtained in the study need to be evaluated and appraised in the background of these limitations.

Conclusion

On the basis of this study, it can be concluded that in the combination regimen, cisplatin-based regimen and carboplatin-

Table 1: Response rate in the subjects of both the groups (regimens I and II) based on the site of lesion

Site of lesion	Number of patients	Regimen I			Number of patients	Regimen II		
		CR[a]	PR[b]	NR[c]		CR[a]	PR[b]	NR[c]
Lip	2	1	1	0	4	0	3	1
Anterior 2/3 of tongue	2	0	2	0	2	0	2	0
Alveolus	5	2	3	0	6	1	4	1
Buccal mucosa	9	3	5	1	4	2	2	0
Floor of the mouth	1	0	1	0	0	0	–	–
Total	19	6	12	1	16	3	11	2

CR[a], Complete response; PR[b]-Partial response; NR[c], No response

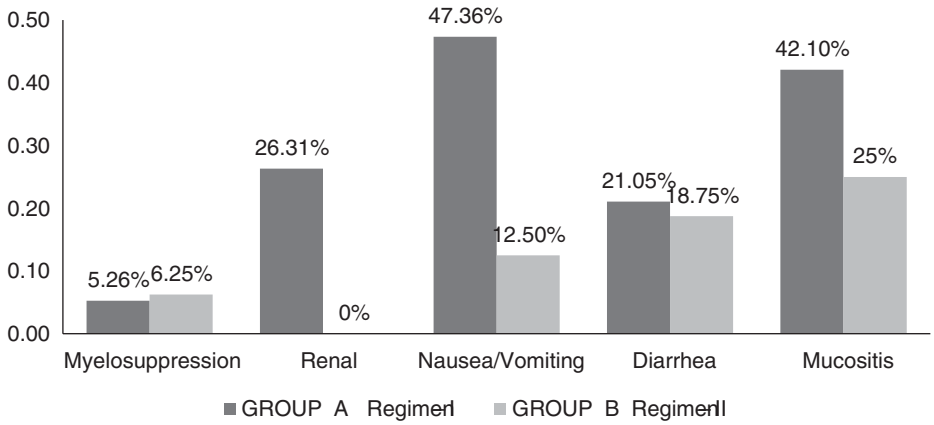

Figure 1: Severe adverse effects observed in both the groups.

based regimen are not significantly different from each other, but carboplatin-based regimen can be considered safe when compared with cisplatin-based regimen. Looking at the pilot nature of this study, there is a need of studies, particularly, clinical trials with large sample size to explore this area furthermore.

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