



# Response of Weekly or Three weekly Taxane & Platinum (TP) schedule as induction therapy before concurrent chemoradiotherapy in Locally Advanced Head & Neck cancers

Kadiyala T <sup>(1)</sup>, Jain V <sup>(2)</sup>, Gaikwad R <sup>(3)</sup>, Pawar A <sup>(1)</sup>, Sharma M <sup>(1)</sup>, Patel D <sup>(1)</sup>

1) Junior Resident, Department of Radiation Oncology, DBVP Rural Medical college, PIMS, Loni, Maharashtra, India.

2) Professor & Head of Department of Radiation Oncology, DBVP Rural Medical college, PIMS, Loni, Maharashtra, India.

3) Senior Resident, Department of Radiation Oncology, DBVP Rural Medical college, PIMS, Loni, Maharashtra, India.

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## Abstract:

**Background:** Induction chemotherapy using Taxane–Platinum (TP) regimens is commonly employed in locally advanced head and neck cancers (LAHNC) to improve tumor response prior to concurrent chemoradiotherapy (CCRT). The optimal scheduling of TP—weekly versus three-weekly—remains uncertain in terms of efficacy and tolerability.

**Aim:** To compare the response and toxicity profile of weekly versus three-weekly TP induction chemotherapy in patients with LAHNC.

**Materials and Methods:** This prospective comparative study was conducted over one year in a tertiary care center and included 20 patients with Stage III and IV head and neck cancers. Patients were divided into two groups: Group A (n=10) received weekly TP regimen, and Group B (n=10) received three-weekly TP regimen. Treatment response was assessed using RECIST criteria, and toxicity was graded as per CTCAE guidelines. All patients subsequently received CCRT.

**Results:** The overall response rate was 80% in both groups. Complete response was slightly higher in the three-weekly group (30% vs 20%), though not statistically significant. Grade III–IV toxicities were more frequent in the three-weekly group (40% vs 20%). Treatment compliance was better in the weekly group, with fewer dose reductions and delays.

**Conclusion:** Weekly TP regimen demonstrated comparable efficacy with better tolerability and compliance compared to the three-weekly schedule, suggesting it may be a preferable induction strategy in LAHNC.

**Keywords:** Head and neck cancer, Induction chemotherapy, Taxane-Platinum regimen

Locally advanced head and neck cancers (LAHNC), predominantly comprising squamous cell carcinomas of the oral cavity, oropharynx, hypopharynx, and larynx, represent a significant oncological burden, especially in developing countries like India. (1) Despite advances in surgical techniques and radiotherapy, the prognosis of LAHNC remains guarded due to high rates of locoregional recurrence and distant metastasis. Concurrent chemoradiotherapy (CCRT) with platinum-based agents has emerged as the standard of care; however, outcomes are often limited by tumor bulk, poor performance status, and treatment-related toxicities.(2,3)

Induction chemotherapy has been explored as a strategy to reduce tumour volume, eradicate micro metastases, and improve subsequent compliance to CCRT. Among various regimens, the combination of taxanes (such as docetaxel or paclitaxel) with platinum compounds (cisplatin or carboplatin), commonly referred to as the TP regimen, has demonstrated promising response rates with a favourable toxicity profile. Additionally, variations in scheduling—weekly versus three-weekly administration—may influence therapeutic efficacy, tolerability, and patient compliance. (4,5,6)

Weekly regimens are often associated with better tolerability and reduced acute toxicities, whereas three-weekly schedules may provide higher dose intensity and potentially improved tumour response. (7) However, the optimal scheduling of TP as induction therapy remains a subject of ongoing investigation. This study aims to evaluate and compare the response rates and tolerability of weekly versus three-weekly TP regimens administered prior to concurrent chemoradiotherapy in patients with locally advanced head and neck cancers.

## I. Introduction:

## II. Study Methodology



The present study was conducted as a prospective, comparative observational study in the Department of Oncology at a tertiary care center over a period of one year. A total of 20 patients diagnosed with locally advanced head and neck cancers (Stage III and IV) were included in the study. Patients were divided into two groups of 10 each based on the induction chemotherapy schedule received: Group A received weekly Taxane and Platinum (TP) regimen, while Group B received three-weekly TP regimen. Ethical clearance was obtained from the Institutional Ethics Committee prior to the commencement of the study, and written informed consent was obtained from all participants.

Patients aged between 18 and 70 years with histopathologically confirmed squamous cell carcinoma of the head and neck region, who were deemed suitable for induction chemotherapy followed by concurrent chemoradiotherapy, were included in the study. Patients with distant metastasis, prior chemotherapy or radiotherapy, severe comorbid conditions, or poor performance status (ECOG >2) were excluded. Baseline evaluation included detailed clinical examination, imaging studies such as contrast-enhanced CT or MRI of the head and neck region, and routine haematological and biochemical investigations.

In Group A, patients received weekly administration of taxane (paclitaxel/docetaxel) along with a platinum agent (cisplatin/carboplatin) for three consecutive weeks, while in Group B, patients received the same combination on a three-weekly schedule for a total of three cycles. Dose modifications were carried out as per toxicity profile and patient tolerance. Following completion of induction chemotherapy, all patients underwent concurrent chemoradiotherapy with standard fractionation and platinum-based chemotherapy.

Treatment response was assessed clinically and radiologically using RECIST criteria after completion of induction chemotherapy and again after CCRT. Toxicity was evaluated using the Common Terminology Criteria for Adverse Events (CTCAE). Data collected were entered into Microsoft Excel and analysed using appropriate statistical methods. Descriptive statistics were used to summarize the data, and comparative analysis between the two groups was performed using Chi-square test or Fisher's exact test, with a p-value of <0.05 considered statistically significant.

The study included 20 patients equally distributed between Group A (Weekly TP) and Group B (3-Weekly TP). The baseline demographic and clinical characteristics were comparable between the two groups, with mean age of 54.2 +/- 8.1 Years in Group A and 56.5 +/- 7.6 Years in

Group B, and a male predominance (75%). The most common primary site was oral cavity (45%), followed by oropharynx (25%), hypopharynx (20%), and Larynx (10%), with the majority presenting in stage IV disease (65%). Treatment compliance was similar in both arms, with induction completion rates of 90% Vs 80% ( $p = 0.53$ ) and CCRT completion rates of 90% Vs 80% ( $p = 0.53$ ) in weekly and 3-weekly groups respectively; dose reductions and treatment delays were slightly higher in the 3-weekly arm but not statistically significant.

During the induction chemotherapy Toxicity profiles were comparable between the weekly TP (Group A) and 3-weekly TP (Group B) regimens. In Group A, Grade I-II toxicities were observed in 70% of patients, including hematological toxicity (30%), mucositis (30%) and nausea / vomiting (10%), while Grade III-IV toxicities occurred in 30% (10% each for hematological, mucositis, and gastrointestinal toxicities). While in Group B, Grade I-II toxicities were seen in 60% of patients, comprising hematological toxicity (30%), mucositis (10%) and gastrointestinal (20%), whereas Grade III-IV toxicities were noted in 40% (hematological 20%, mucositis 10%, and gastrointestinal 10%) showing no significant differences between the two groups and no significant difference in haematological, mucositis, or gastrointestinal toxicities. Response evaluation showed similar efficacy, with complete response rates of 20% vs 30%, partial response 60% vs 50%, and overall response rate of 80% in both groups ( $p = 1.00$ ). Overall, weekly and 3-weekly TP regimens demonstrated comparable compliance, toxicity and treatment response without any statistically significant differences.



### III. Results

**Table 1: Demographic and Clinical Profile of Patients (n = 20)**

Variable	Group A (Weekly TP) (n=10)	Group B (3-weekly TP) (n=10)	Total (n=20)
Mean Age (years)	54.2 ± 8.1	56.5 ± 7.6	55.3 ± 7.8
Gender (Male)	8 (80%)	7 (70%)	15 (75%)
Gender (Female)	2 (20%)	3 (30%)	5 (25%)
Primary Site – Oral cavity	4 (40%)	5 (50%)	9 (45%)
Oropharynx	3 (30%)	2 (20%)	5 (25%)
Hypopharynx	2 (20%)	2 (20%)	4 (20%)
Larynx	1 (10%)	1 (10%)	2 (10%)
Stage III	4 (40%)	3 (30%)	7 (35%)
Stage IV	6 (60%)	7 (70%)	13 (65%)

**Table 2: Compliance and Completion of Treatment**

Parameter	Group A (Weekly TP) (n=10)	Group B (3-weekly TP) (n=10)	p-value
Completed Induction Therapy	9 (90%)	8 (80%)	0.53
Dose Reduction Required	2 (20%)	4 (40%)	0.36
Delay in Treatment (>1 week)	1 (10%)	3 (30%)	0.27
Completed CCRT	9 (90%)	8 (80%)	0.53

**Table 3: Toxicity Profile During Induction Chemotherapy (CTCAE)**

Toxicity -	Group A (Weekly TP) (n= 10)			p-value
Grade I-II Toxicity)	Haematological Toxicities	Mucositis	Nausea /Vomiting	0.34
Grade I–II Toxicity - 7(70%)	3(30%)	3(30%)	1(10%)	1.00
Grade III-IV Toxicity 3(30%)	1(10%)	1(10%)	1(10%)	1.00
<b>Toxicity</b>	<b>Group B (3-Weekly TP) (n=10)</b>			0.75
Grade I-II Toxicity)	Haematological Toxicities	Mucositis	Nausea /vomiting	
Grade I-II Toxicity) 6(60%)	3(30%)	1(10%)	2(20%)	1.00
Grade III-IV Toxicity 4(40%)	2(20%)	1(10%)	1(10%)	1.00
P- value of other toxicities	Haematological toxicities P-Value in both arms TP weekly and Three weekly TP P = 1.00	P-Value of mucositis in both arms P = 0.58	Nausea /vomiting P-Value of GI toxicities in both arms weekly TP and Three weekly TP P = 1.00	

**Table 4: Response to Induction Chemotherapy (RECIST Criteria)**

Response Category	Group A (Weekly TP) (n=10)	Group B (3-weekly TP) (n=10)	p-value
Complete Response (CR)	2 (20%)	3 (30%)	0.62
Partial Response (PR)	6 (60%)	5 (50%)	
Stable Disease (SD)	1 (10%)	1 (10%)	
Progressive Disease (PD)	1 (10%)	1 (10%)	
Overall Response (CR+PR)	8 (80%)	8 (80%)	1.00

#### IV.

#### V. Discussion:

The present study evaluated and compared the efficacy and tolerability of weekly versus three-weekly Taxane-Platinum (TP) induction chemotherapy regimens in patients with locally advanced head and neck cancers (LAHNC) prior to concurrent chemoradiotherapy (CCRT). The findings of this study demonstrated that both regimens achieved comparable overall response rates, with no statistically significant difference between the two groups, while differences were observed in toxicity profiles and treatment compliance. (8)

In the current study, the overall response rate (complete response + partial response) following induction chemotherapy was 80% in both groups, indicating that weekly and three-weekly TP regimens were equally effective in tumor cytoreduction. Although the three-weekly regimen showed a slightly higher complete response rate (30% vs 20%), this difference was not statistically significant. These findings are consistent with previous studies that have demonstrated the efficacy of taxane-platinum combinations as induction therapy in LAHNC, where response rates typically range between 70–85%. The comparable response observed in both schedules suggests that dose fractionation in the weekly regimen does not compromise antitumor activity. (9,10,11)

The toxicity profile differed between the two groups, with the three-weekly TP regimen demonstrating a higher incidence of Grade III–IV toxicities (40% vs 20%) as compared to the weekly schedule. Hematological toxicity, mucositis, and gastrointestinal side effects were more frequent in the three-weekly group, although the differences were not statistically significant, possibly due to the small sample size. The weekly regimen, with its lower peak drug concentration and better tolerability, appeared to be associated with predominantly Grade I–II toxicities. This observation aligns with the pharmacological rationale that dividing the total dose into smaller, more frequent administrations reduces acute toxicity while maintaining efficacy.

Treatment compliance was better in the weekly TP group, where 90% of patients completed induction therapy and subsequent CCRT, compared to 80% in the three-weekly group. Additionally, dose reductions and treatment delays were more common in the three-weekly regimen, reflecting its relatively higher toxicity burden. Improved compliance in the weekly schedule is clinically significant, as uninterrupted treatment is crucial for achieving optimal outcomes in head and neck cancers. These findings are in agreement with other clinical observations where weekly chemotherapy regimens have been preferred in patients with borderline performance status or comorbidities. (12)

The demographic and clinical characteristics of patients in both groups were comparable, with a predominance of male patients and Stage IV disease, which is typical of LAHNC presentations in the Indian population. The distribution of primary tumor sites was also similar between groups, minimizing selection bias and allowing for a more reliable comparison of treatment outcomes.

Despite these findings, the study has certain limitations. The small sample size (n=20) limits the statistical power and generalizability of the results. Additionally, the short duration of follow-up precluded assessment of long-term outcomes such as progression-free survival and overall survival. Larger randomized controlled trials with extended follow-up are required to validate these findings and determine the optimal scheduling strategy.

#### VI. Conclusion:

In conclusion, both weekly and three-weekly TP induction chemotherapy regimens demonstrated comparable efficacy in terms of tumor response in LAHNC. However, the weekly regimen showed a trend toward better tolerability and improved treatment compliance, suggesting that it may be a more suitable option, particularly in patients where toxicity is a concern.

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