

## Abstract

**Background/Objectives:** Induction chemotherapy (IC) is frequently used as part of treatment in head and neck mucosal squamous cell carcinoma (SCC). We sought to evaluate the most common regimens of IC and response rates to evaluate potential predictors of IC response.

**Study Design:** Literature Review

**Methods:** A PubMed search of the terms “induction chemotherapy” OR “neoadjuvant chemotherapy”, AND “head and neck”. This resulted in 2,587 studies. Studies were included if induction regimen included a platinum-containing agent, and measured response rate to IC prior to subsequent treatment. Studies were excluded if response rates were not recorded. Only cases of mucosal SCC were included; nasopharynx was excluded.

**Results:** Final analysis included 21 studies. Among 3110 subjects who received IC, 2,333 had a recorded response (75%). Among subjects in studies specifying complete vs. partial response (n=1,486), 35% had complete response while 65% had partial response. Along with a platinum-containing agent, most studies included at least one of either 5-fluorouracil or docetaxel; some included cetuximab. Response to induction chemotherapy was evaluated using combinations of RECIST criteria (20%), physical exam (endoscopic and direct laryngoscopic evaluation) (37%), and non-RECIST radiological evaluation (43%). Response to IC was primarily a secondary outcome. Primary outcomes included overall survival, progression free survival, laryngectomy-free survival, response rate to chemoradiation at the end of treatment.

**Conclusions:** Use of IC in head and neck cancers is broadly reported in the literature. However the measurement of response is varied. Further analysis is needed to determine predictors of IC response.

## Objectives/Background

Non-surgical treatment of head and neck cancers often involves concomitant chemoradiation; however other regimens can include induction chemotherapy followed by definitive radiation, definitive chemotherapy, or surgery<sup>1,2</sup>. There are numerous induction chemotherapy regimens that have been trialed, and response rates are encouraging although still being evaluated<sup>3,4</sup>. Regimens may include platinum-based compounds, taxane-compounds, and even biologics<sup>5</sup>. **The goal of our study was to target studies that evaluated the use of induction chemotherapy with platinum-based regimens and assess group response to therapy, with our ultimate goal to evaluate potential predictors of IC response.**

## Study Design and Methods

A PubMed search of the terms "induction chemotherapy" OR "neoadjuvant chemotherapy", AND "head and neck". This resulted in 2,587 studies. Studies were included if induction regimen included a platinum containing agent, and measured response rate to IC prior to subsequent treatment. Only cases of mucosal SCC were included; nasopharynx was excluded. Studies were eliminated if information relating to the induction chemotherapy administration was not available, including agent used, time course of treatment, and method of measuring response to induction chemotherapy. Studies were also excluded if there was no note made of patient demographics, including but not limited to gender, race, and ethnicity.

	Studies	Patients receiving IC	Patients with IC response reported in study	Patients with any recorded response to IC	Among studies differentiating between partial vs. complete response to IC	
					Partial response	Complete Response
Multi-subsite	16	2796	2,066	1,549 (75%)	930 (69%)	419 (31%)
Oral Cavity	1	19	19	10 (53%)	0	0
Oropharynx	3	151	151	137 (91%)	41 (30%)	96 (70%)
Larynx	1	97	97	73 (75%)	0	0

Table 1: IC studies by sub-type and response rates

	Studies	Patients receiving IC	Patients with IC response reported in study	Patients with any recorded response to IC	Among studies differentiating between partial vs. complete response to IC	
					Partial response	Complete Response
PF	3	313	98	69 (70%)	44 (64%)	25 (36%)
TPF	6	692	486	367 (76%)	103 (43%)	138 (57%)
TPF vs. PF	4	1244	935	702 (75%)	522 (74%)	180 (26%)
TP vs. Other	2	199	199	147 (74%)	-	-
PF vs. Other	2	401	401	293 (73%)	194 (69%)	89 (31%)
Platin + Other	3	146	146	129 (90%)	69 (53%)	60 (47%)
Other	1	68	68	62 (91%)	39 (63%)	23 (37%)

Table 2: IC studies by IC-regimen used and response rates

PF – cisplatin and 5-fluorouracil  
TPF- docetaxel, cisplatin, and 5-fluorouracil  
TP – docetaxel and cisplatin

## Results

- Final analysis included 23 studies.
- Majority of studies included application of induction therapy throughout multiple subsites within head and neck (**table 1**).
- Most common IC regimen was TPF (docetaxel, cisplatin, and 5-fluorouracil); other regimens are listed in **table 2**.
- Among 3,110 subjects who received IC, 2,333 had a recorded response (75%).
- Among subjects in studies specifying complete vs. partial response (n=1,486), 35% had complete response while 65% had partial response.
- Response to induction chemotherapy was evaluated using combinations of RECIST criteria (20%), physical exam (endoscopic and direct laryngoscopic evaluation) (37%), and non-RECIST radiological evaluation (43%).
- Response to IC was primarily a secondary outcome. Primary outcomes included overall survival, progression free survival, laryngectomy free survival, response rate to chemoradiation at the end of treatment.

## Conclusions and Future Directions

- 90% of patients receiving IC had a response, with 65% PR and 35% CR.
- Induction regimens are varied, but the most common regimen is TPF.
- A variety of response assessment criteria are employed and area inconsistent, with some physical examination and some radiological. RECIST criteria was employed in only 20% of studies
- Future Directions: Request primary study data from authors to perform a pooled analysis for response to therapy. Such a study would evaluate patient demographics and cancer variables for response to IC.

## Citations

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