

**Management of secretions in head & neck cancer patients with and without use of glycopyrrolate – A prospective randomized comparative study**

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**Abstract**

**Introduction:** There has been little emphasis in past on management of excessive secretions, sialorrhea, salivary fistula and sialocele in patients who have been operated for head and neck cancer surgeries. These are well known complications and can represent a challenging clinical scenario.

**Aims and objectives:** Aim of this study was to compare management of secretions in head and neck cancer patients with & without use of glycopyrrolate as a prospective randomized comparative to study.

**Materials and Methods:** The study was conducted on patients of head and neck cancer undergoing resection of oral cavity tumours; between November 2019 and September 2021. They were divided into two groups. Group A comprised of 30 patients for whom injection glycopyrrolate was given & Group B comprised of 30 patients in which injection glycopyrrolate was not given.

**Results:** Within the follow-up period of 2 years Group A patients had less no. of complications with decreased secretions and better post-operative response as compared to Group B. However ‘Group A patient had mild transient tachycardia which was self-corrected.

**Conclusion:** Glycopyrrolate may be a useful adjuvant in the management of secretions related complications and help in healing.

**Keywords:** H & N cancer, glycopyrrolate, tachycardia, secretions, post-operative complications, SCC.

**Introduction**

Anticholinergic drugs like atropine, scopolamine and glycopyrrolate are usually given as a substitute to decrease the secretions in general and also to prevent complications occurring post-surgery.<sup>1</sup> Atropine and scopolamine have strong parasympathetic responses with good blood brain barrier crossing along with that they have the capacity to stimulate medullary centres causing vagal responses like respiratory and vasomotor responses, More over they can also cause tachycardia, mydriatics of eyes, reduction of tone and amplitude of stomach and intestine contraction, incomplete peristalsis of intestine and stomach, urine retention along with excessive dryness, dysphonia, dysphagia, and mild rise in body temperature.<sup>2</sup> Glycopyrrolate is also a quaternary ammonium compound with incomplete oral absorption and poor penetration in brain and eyes with generally slower elimination with higher nicotinic blocking property and can cause as a side effect hypotension and impotence along with reduction of secretions in general, but lesser as compared to atropine and scopolamine.<sup>2</sup>

**Material and Methods**

The study was conducted on patients of head and neck cancer undergoing resection of oral cavity tumours, in our department between November 2019 and November 2021.

**Collection of data**

60 patients who fulfilled the inclusion criteria were selected and were randomly divided into two groups of 30 patients each. Group A– patients received 0.2mg/iv

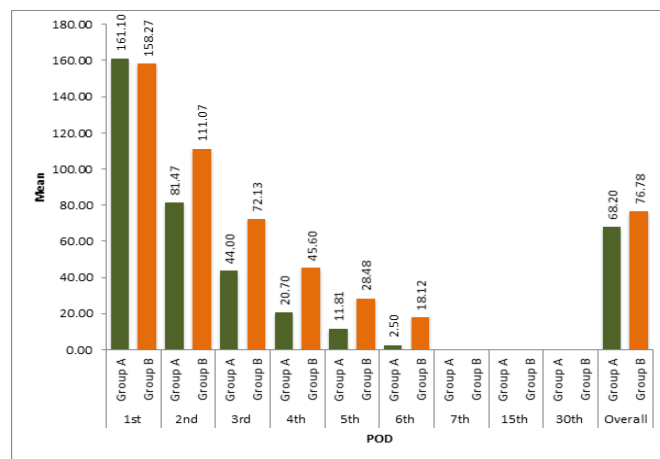
glycopyrrolate for 5 days post operatively and Group B– patients did not receive glycopyrrolate as a post-operative medication.

**Parameters for comparison included**

1. To compare the average time post-surgery to discharge in both the groups.
2. To measure the collection in drains in both the groups.
3. Time taken from post-surgery to removal of drains in both the groups
4. Comparison of patient complains in both the groups.
5. To record and compare post-operative complication in both the groups

**Results**

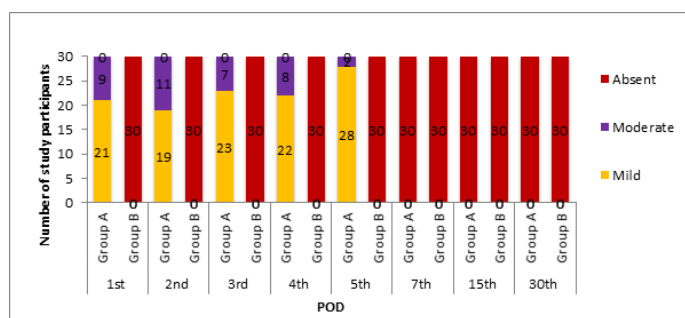
The time of discharge was recorded in both the groups. In group A, 14 patients (46.7%) were discharged prior to 5<sup>th</sup> day and 16 patients were (53.3%) discharged between 5-10 days and in group B, 1 patient (3.3%) in < 5 days and 29 patients (96.7%) between 5-10 days, which was statically significant. The outcome was that group A patients were discharged earlier then group B. Overall mean drain collection group A was 68.20 ml and for group B it was 76.78 ml, which was statically significant. Hence there was reduction in drain collection in group A. (Graph 1).



Graph 1: drains/ secretions collection.

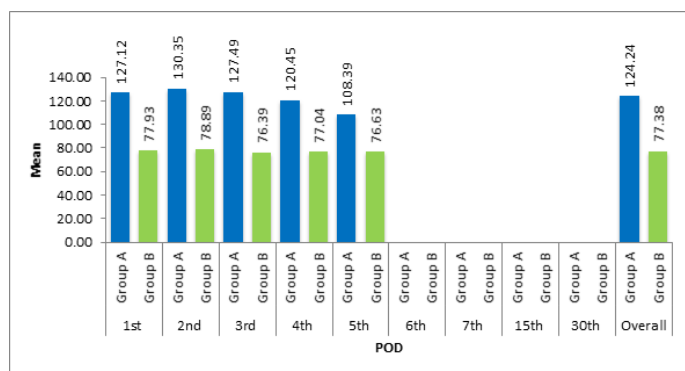
We also compared for day of drain removal, in this we observed that in group drain removal was earlier (i.e. mean 4.60 days) as compared to group B (mean 5.53 days), with a significant p value <0.001.

Dryness was categorised into mild, moderate, severe & absent. It was found that all the patients who received glycopyrrolate i.e. group A had dryness, which ranged between mild to moderate. Whereas in group B it was absent in almost all patients, which was statically significant. However, in some patients of group B there was excessive or drooling of saliva during the post operative days, which was not seen in group A. (graph 2)



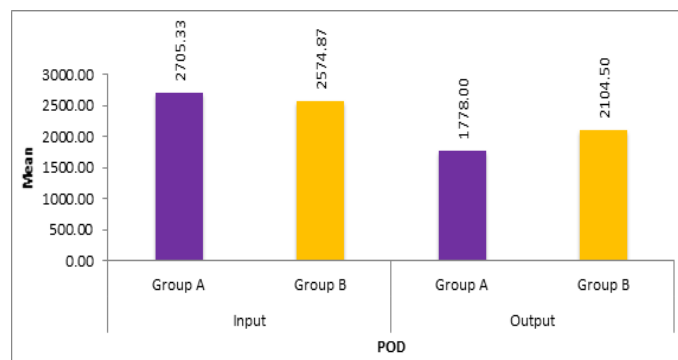
Graph 2: patient's complaints drug associated-dryness

The main disadvantage of glycopyrrolate was Sinus Tachycardia which was observed in our study in maximum number of patients in group A. The mean value of tachycardia in group A was 124.24 mmHg and in group B it was 77.38 mmHg, which was statically significant. (Graph 3)



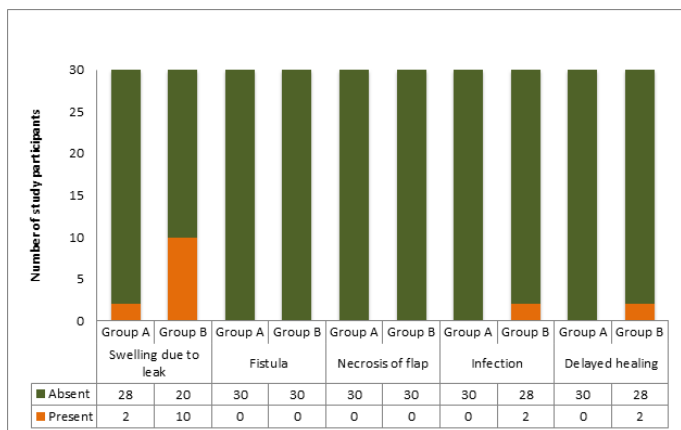
Graph 3: patient's complaints drug associated-tachycardia

Urination was also affected by glycopyrrolate in our study. It was observed that the mean input of group A was 2705.33 ml and mean output was 1778.00 ml. whereas, the mean input of group B was 2574.87 ml and mean output was 2104.50 ml, which was statically significant. (Graph 4)



Graph 4: patient's complaints drug associated - urination  
On observation we found that in group A there were 2 patients who had swelling due to sialosele whereas in group B same was seen in 10 patients & this was statically significant. Hence, we can say that glycopyrrolate is beneficial in reduction of secretions and concomitant sialo cele and other complications. (Graph 5)

The blood pressure of the patients was also noted periodically during post-operative days from within 15 min of drug being administered and we observed that there was transient change in blood pressure which came to normal limits within 3 hours and was statically not significant. Hence, we conclude that there was no marked difference in BP in both the groups.



Graph 5: patient’s complaints drug associated - other complications

### Discussion

Although the most common clinical symptoms of head & neck cancer patients are progressive dysphagia, one of the most distressing symptom is increased secretions. This leads to increase in the collection of secretion in surgical site, fistula formation and delay in healing process. Controlling these complications becomes a major quality of life issue.<sup>2</sup>

According to Rashid. H. at al; enteral GP was given to patients with esophageal cancer to control excessive secretions due to dysphagia. In 6 patients, GP 0.2 mg QID was given through a gastric tube. Within 24–48 hours all the patients showed a reduction in secretion. None of their patients experienced CNS side effects; one had worsening of constipation and was treated with laxatives.<sup>2</sup>

In our study, our patients who received glycopyrrolate had reduced secretion & as compared to other group, 14 patients were discharged in less than 5 days and remaining 16 patients were discharged between 5-10 days in group A. In group B, 1 patient was discharged in less than 5 days and 29 patients between 5-10 days in group B. Hence, we can conclude that the patients who

received glycopyrrolate got discharged earlier than other group.

In our study we observed that the group A patients with glycopyrrolate had reduced drain collection with a mean value of 68.20 ml whereas in group B patient without glycopyrrolate their mean was 76.78 ml which was significant statically. Enabled us to remove the drain earlier in group A with GP as compared to group B without GP.

According to Kerrison J at al; that Anticholinergic drugs reduce salivary, bronchial and sweat secretions. However, larger doses of these drugs can cause tachycardia, urinary retention and can also reduce gastrointestinal motility along with reduction of GI secretion. However, they found that in salivary flow technique and sweat gland test using glycopyrrolate as an injectable form and significantly suppressive effects was and seen moreover symptoms of dry mouth was relatively low.<sup>3</sup>

In a single centred prospective study of two groups by Prasert Sawasdiwipachai et al one group was treated with glycopyrrolate and other group did not receive glycopyrrolate. The group which received glycopyrrolate demonstrated good reduction in salivary secretion and the heart rate was within normal limit<sup>4</sup>.

In our study, majority of patients in group A (with GP) experienced mild xerostomia and few patients had moderate xerostomia whereas, the group without GP did not complain of dryness. Hence we can say that GP induces xerostomia in majority of patients.

In our study, the blood pressure of the patients was also noted periodically during post-operative days from within 15 min of drug being administered under the guidance of a cardiologist. We observed that the mean HR of group A (with GP) was 124.28/min, within 5 to 10

minutes after the administration of the drugs and gradually came to within normal limit in about 1-3 hours. Whereas, the mean HR of group B (without GP) was 77.38/per min. Hence, we conclude that GP caused transient tachycardia in majority of patients.

According to Kaltiala E et al<sup>5</sup>; stated that it reduces the tone of smooth muscles in the urinary tract leading to decreased motility. It should be used cautiously in patients with prostatic hypertrophy because it can precipitate urinary retention.

Similarly, in our study we found that GP caused urine retention. It was observed that the mean input of group A was 2705.33 ml and mean output was 1778.00 ml. whereas, the mean input of group B was 2574.87 ml and mean output was 2104.50 ml. This was statically significant.

There were some other complications which was also observed in our study; i.e. swelling due to leak / sialocele, fistula, necrosis of flap / suturing site, infection and delayed healing.

Shawn Mathur et al; presented a case of an infant girl with VACTERL syndrome who underwent repair of a type C esophageal atresia and tracheoesophageal fistula repair, which was complicated by an anastomotic leak. Glycopyrrolate (Robinul), was successfully used to decrease copious salivary secretion and promote spontaneous closure of the leak. They concluded that Glycopyrrolate was a useful adjunct in the management of anastomotic leak after tracheoesophageal repair.<sup>6</sup>

In our study, sialocele or swelling due to leak was observed in 2 out of 30 patients in group A whereas 10 out of 30 patients complained of swelling in group B.

Other complications like fistula and necrosis of flap and suturing site was also in our criteria but we did not noticed such complications because we treated sialocele

in early phase and did not give any chance to it to convert into fistula.

Hence, according to literature and our statistical data and observation we can say that glycopyrrolate helped in reduction in complication associated with cancer surgery and helped in healing.

### Conclusion

Overall, this study highlight's role of GP in management of H & N cancer patient and has found that gp has more beneficial effects then side effect on H&N cancer patients. Glycopyrrolate drugs (i.e. rubinol or pyrolate) are usually given as a substitute to decrease the secretions in general and also as an aid to prevent complications occurring post-surgery.

In this study we found that;

1. The time of discharge of patient on GP was earlier.
2. There was significant reduction of drain collection in patients with GP.
3. The day of drain removal was early in patients with GP.
4. There was mild transient tachycardia that resolved within 2-4 hours & this was statically significant.
5. Swelling due to leak or sialocele was found in patients without GP & this was treated by GP and pressure dressing.
6. Infection was observed in 2 patients without GP after the discharge, which was treated with antibiotics.
7. Delayed healing was observed in 2 patients of group B without GP that was treated in follow up days.

Our result indicates that GP is a good substitute for reduction of secretions and to reduce post-operative complication in H & N cancer patients. However, more multicentric studies have to be conducted with more sample size for a better conclusive result.

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