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A COMPARATIVE OBSERVATIONAL STUDY OF TWO DIFFERENT ROUTES (IV & NEBULIZATION) OF DEXAMETHASONE TO DECREASE POST OPERATIVE SORE THROAT

Anaesthesiology

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ABSTRACT

Backgrounds and aims: Post operative sore throat(POST) is a common complication after general anaesthesia with ETT which results in cough, causing discomfort, dissatisfaction and surgical site pain due to straining.There are so many non-pharmacological and pharmacological methods are there to decrease post operative sore throat. Our aim is to to observe and compare the effect of dexamethasone in two different routes(intravenous & nebulization) to decrease post operative sore throat.**Materials and Methods:** This is a comparative observational study between dexamethasone in IV route (group I, N=52) and dexamethasone via nebulization (group N, N=52) to decrease post operative sore throat. Sore throat will be graded as 0,1,2,3 for no pain, mild, moderate and severe pain in post operative period. Data would be collected according to severity of pain scoring among these two groups.**Results:** In group N, 85.42% patients were found with Post operative sore throat (POST) Grade 0 and in group I,Grade 0 POST was in 54.35% patients. Distribution between two groups were statistically significant (p=0.01). In group N, coughing was present in 20.83% patients and hoarseness was present in 16.67% patients. In group I, coughing was present in 43.47% patients and hoarseness was present in 36.69% patients. Both results are statistically significant.(p=0.019 & 0.026 respectively).**Conclusion:** Nebulization Dexamethasone was more efficient for reduction of incidence of Post Operative sore throat (POST), hoarseness of voice and cough than IV Dexamethasone.

KEYWORDS

Dexamethasone, Nebulization, Postoperative Sore Throat.

Postoperative sore throat (POST) represents a common yet underestimated complication encountered in patients undergoing general anaesthesia with endotracheal intubation, affecting their immediate postoperative experience and overall satisfaction. POST occurs in most of the patients after endotracheal intubation but in different grade of severity.So to decrease such a common but preventable complication of general anaesthesia many researches are already been done.

According to Lee et al[1] it also add to patient's morbidity and making post operative period a bad memory for patient. The incidence of POST may be up to 90% [2,3,4] and that of hoarseness reported in different studies ranges from 4 to 43% [5,6].

The intravenous (IV) administration of dexamethasone has been extensively studied and demonstrated to be effective in reducing the occurrence of POST. By exerting its systemic anti-inflammatory effects, IV dexamethasone has shown efficacy in minimizing airway mucosal trauma and inflammation, thereby reducing the likelihood of postoperative throat discomfort. However, the potential benefits of administering dexamethasone via alternative routes, such as nebulization, have not been comprehensively explored in the context of POST prevention.

Intracuff lidocaine decrease POST but may increase hoarseness due to nerve paresis[7] while aspirin gargle may affect coagulation[8]. Previous studies suggest that dexamethasone is effective in decreasing the incidence of POST when given via different routes I.e. intravenous[9,10,11,12,13] nebulization [14] or topical[1].

This study aims to conduct a comprehensive comparative observational study to evaluate the effectiveness of dexamethasone administered via IV and nebulization routes in reducing POST. By systematically assessing patient outcomes, including the incidence and severity of POST, as well as associated variables such as pain scores, analgesic requirements, and patient satisfaction, this study seeks to provide valuable insights into the optimal approach for POST prevention in surgical patients. Ultimately, the findings of this research endeavor have the potential to inform evidence-based clinical practice guidelines, refine perioperative care strategies, and ultimately enhance the quality of care and patient experience in surgical settings.

Methods

On obtaining approval from institutional ethics committee and written informed consent from participants who has fulfil the criteria, our observational study was conducted on those patients undergoing surgery under general anaesthesia. Total 104 patients were selected who were undergoing the said surgery and fulfil the criteria were allotted into two groups as per Simple random sampling in group I (dexamethasone 8mg is given in intravenous route) and group N(dexamethasone 8mg given in nebulization). A detailed pre-anaesthetic checkup (PAC) was done. An informed consent was taken in written after explaining the whole procedure in their understandable language.

Fasting for 6 hours was ensured and all study population received 0.25 mg alprazolam night before the surgery. In the operation theatre(OT) monitors (electrocardiography, pulse oximeter(Spo2),non- invasive blood pressure (NIBP) and nasopharyngeal probe for core body temperature were attached and baseline vitals were recorded. An 18-gauge IV cannula was secured, preloading was done with Ringer lactate(RL) 15ml/kg (RL was infused at 2ml/kg/h intraoperatively) and was adjusted according to haemodynamics. Temperature of IVF was maintained at 22^0C-24^0C. All the patients were covered with a single level of surgical drapes over the chest, arms and abdomen intraoperatively and blanket postoperatively. Sample was collected by serial sampling technique as per observational protocol. Along with dexamethasone all the patients were received inj.glycopyrrolate, inj.midazolam and an opioid 5 minutes prior of induction.

Preoxygenation was done with 100% oxygen over 3 minutes. All the patients were induced with inj.propofol 2mg/kg.Following induction with propofol inj.atracurium (0.5mg/kg body weight) was used as muscle relaxant for intubation, then patients were intubated with appropriate size endotracheal tube. Patients who required manipulation or instrumentation of airway (like oral airway, stylet, bougie, external laryngeal manoeuvre), need 2nd attempt during ETT insertion was excluded from our study. Anaesthesia was maintained with isoflurane (1%), N2O and 33% O2 during intraoperative period.

Patients were reversed and extubated at the end of surgery with help of inj.neostigmine (0.05mg/kg) and inj.glycopyrrolate(10mcg/kg). Those who coughed during extubation were also be excluded from the study.

Then patients were observed for next 24 hours at surgery ward for assessment of POST, hoarseness and coughing.

Methods of data collection

Data was recorded in case record sheets. Sore throat will be graded as—[15]

0= no sore throat
1= mild sore throat (complains of sore throat only on asking)
2= moderate sore throat (complains on his/her own)
3= severe sore throat (change in voice associated with throat pain)

Post operative nausea & vomiting were recorded as presence or absence of the particular event upto 24 hours in post operative period.
For assessment of post operative analgesia the pain score of the patients were assessed using a 10 point visual analogue scale (VAS) for 24 hour in the postoperative period, at 1st, 2nd, 3rd, 4th, 6th, 8th, 10th, 12th, 15th, 18th and 24th h.

RESULTS

Demographic data and clinical parameters were similar in both the groups in my study as shown in. In Group N incidence of coughing (20.83%) and hoarseness (16.67%) were fewer than Group I where coughing was present in 43.47% and hoarseness was present in 36.69%. P value for coughing and hoarseness were 0.019 and 0.026 respectively. Nausea was present in fewer patients in Group N(10.42%) than Group I(23.91%). Similarly more number of patients with vomiting was found in Group I(6.52%) than Group N(2.08%).

In group N, 85.42% patients were found with Post operative sore throat (POST) Grade 0, 8.33% patients with POST Grade 1, 4.17% patients with Grade 2, 2.08% patients with Grade 3 and in group I, 54.35% patients with Grade 0, 21.74% patients with Grade 1, 10.87% patients with Grade 2, 13.04% patients with Grade 3. (Table 2, Figure 2). Distribution of POST scores in between these two groups was found statistically significant (p value =0.010). Visual Analog Scale (VAS) score was taken in 1st, 2nd, 3rd, 4th, 6th, 8th, 10th, 12th, 15th, 18th, 24th hours in post operative period. It was found that in group N, VAS scores were in lower side compared to group I upto 24th hour in post operative period. Comparison of VAS score between these 2 groups were statistically significant upto 12th post operative period.

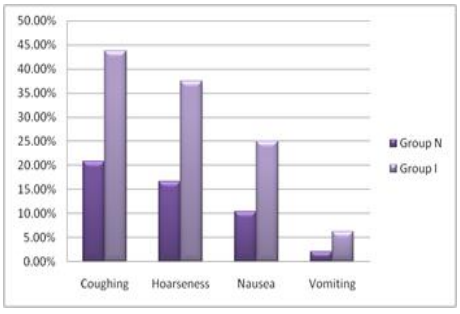

Figure no 1: Bar diagram showing distribution of coughing, Hoarseness, Nausea and Vomiting in between groups.

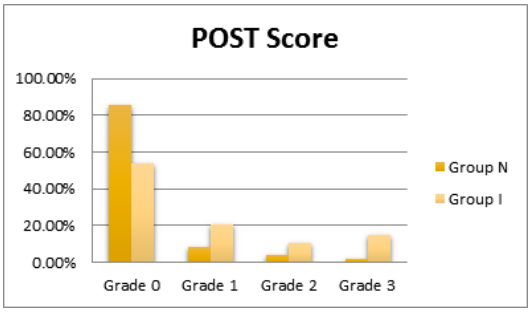

Table no 1: Distribution of coughing, Hoarseness, Nausea and vomiting in between groups

Parameters	Group	N	Distribution	P value
Coughing	N	48	Yes:10(20.83%), No:38(79.17%)	0.019*
	I	46	Yes:20(43.47%), No:26(56.53%)	
Hoarseness	N	48	Yes:8(16.67%), No:40(83.33%)	0.026*
	I	46	Yes:17(36.96%), No:29(63.04%)	
Nausea	N	48	Yes:5(10.42%), No:43(89.58%)	0.082
	I	46	Yes:11(23.91%), No:35(76.09%)	
Vomiting	N	48	Yes:1(2.08%), No:47(97.92%)	0.287
	I	46	Yes:3(6.52%), No:43(93.48%)	

Table no 2: Distribution of POST scores in between groups.

Parameters	Groups	N	Distribution	P value
POST SCORE	N	48	Grade 0:41(85.42%),Grade1:4(8.33%) Grade 2: 2(4.17%), Grade 3: 1(2.08%)	0.010*
	I	46	Grade 0: 25(54.35%), Grade 1: 10(21.74%) Grade 2: 5(10.87%), Grade 3: 6(13.04%)	

DISCUSSION:

In our study, incidence of POST was 45.65% in patients who received intravenous dexamethasone. Similar kind of results were found in various studies previously. Subedi et al.[9] administered dexamethasone 8 mg iv just before induction in one group and found the incidence of POST to be 36%, while Thomas et al.[10] administered a similar dose and found the incidence to be 20% at 24 h. Bagchi et al.[16] found the incidence of sore throat with intravenous dexamethasone (0.2 mg/kg) was 29.2% at the end of 24h. In a study by Park et al.[17] ,POST was found in 28% patients at the end of 24 h when prophylactic intravenous dexamethasone 10 mg was administered. In a meta-analysis by Jiang et al.[11] , authors concluded that prophylactic administration of dexamethasone ≥ 0.2 mg/kg intravenously within 30 min before or after induction of general anaesthesia should be recommended as grade 1A evidence with safety and efficacy for patients without pregnancy, diabetes mellitus, or contraindications for corticosteroids.
The incidence of POST decreased to 14.58% when the patients were nebulized with dexamethasone. Hence, nebulization was found to be most effective method in decreasing POST. Salama et al.[14] showed the incidence and severity of POST were significantly reduced in the dexamethasone group than in the saline group at 2, 4, 8, and 12 h after extubation; however, we got statistically significant differences even after 24h. No complication was reported with dexamethasone nebulization. In a meta-analysis by Kuriyama et al.[18] , it was found that aerosolized corticosteroids may be superior to non-analgesic methods in preventing POST.

Incidence of hoarseness was found in 36.96% of patients who received intravenous dexamethasone and 16.67% of patients who received dexamethasone nebulization. This result was statistically significant, so nebulization route is more effective in decreasing hoarseness. In the study of Bagchi et al.[16], incidence was slightly less than our study and it was 29.2% which was equal to the incidence of POST. Some studies showed incidence of hoarseness is slightly high even after giving higher dose of Dexamethasone than our study like Park et al.[17] found hoarseness in 56% patients at the end of 24 h when prophylactic intravenous dexamethasone 10 mg was administered.

Coughing was present in 20.83% of patients who received dexamethasone nebulization and in 43.47% of patients who received intravenous dexamethasone. Here also, for prevention of cough dexamethasone nebulization is more effective than intravenous dexamethasone.

Post operative analgesia was compared between these two groups; who were given dexamethasone nebulization and the same in intravenous route. It was measured through VAS scores. In 1st, 2nd, 3rd, 4th, 6th, 8th, 10th, 12th hour in post operative period VAS scores were in lower side in nebulization group compared with intravenous group ($p<0.05$). In 15th, 18th, 24th hour in post operative period we got similar trends but results were not statistically significant.

CONCLUSION

To conclude, nebulization Dexamethasone was more efficient for reduction of incidence of Post Operative sore throat (POST), hoarseness of voice and cough than IV Dexamethasone.

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