



## Original Article

# Comparison of Dexamethasone and Gabapentin alone or in Combination for Controlling Pain in Patients of Adenotonsillectomy

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## Abstract

**Background:** Tonsillectomy is surgical removal of tonsils. It is usually combined with an adenoidectomy, which is the removal of the adenoid. The present study was conducted to assess the role of gabapentin and dexamethasone alone or in combination in the management of postoperative pain following adenotonsillectomy.

**Materials & Methods:** The present study was conducted on 84 patients underwent adenotonsillectomy. All were divided into 2 groups of 42 each. Group I (42) received Gabapentin 10mg/kg 2 hour before induction of anesthesia. Group II received combination of both Gabapentin 10mg/kg 2 h before induction of anesthesia and 0.15 mg/kg dexamethasone after induction of anesthesia. In all groups, pain score was recorded.

**Results:** Mean age in group I was  $24.6 \pm 4.5$  and in group II was  $25.1 \pm 5.2$  years. Weight in group I was  $66.8 \pm 8.2$  Kg and in group II was  $64.0 \pm 6.4$  Kg in group II. Duration of anesthesia in group I was  $34.6 \pm 1.2$  minutes and in group II was  $35.2 \pm 1.6$  minutes. Pethidine consumption in group I was  $8.6 \pm 4.8$  mg and in group II was  $5.4 \pm 4.2$  mg. The difference was significant ( $P = 0.02$ ). Post-operative nausea and vomiting (PONV) was 25% in group I and 22% in group II. The difference was non-significant ( $P = 0.1$ ). The pain score in group I was  $0.94 \pm 1.24$  and in group II was  $0.67 \pm 0.78$  after 2 hours,  $1.42 \pm 1.62$  and  $0.95 \pm 0.22$  after 4 hours in group I and group II respectively after 4 hours,  $2.80 \pm 0.92$  in group I and  $1.22 \pm 0.94$  in group II after 6 hours and  $5.52 \pm 0.22$  in group I and  $4.62 \pm 1.25$  in group II respectively. The difference was significant ( $P < 0.05$ ).

**Conclusion:** Gabapentin along with Dexamethasone proved to be effective in controlling post operative pain in patients undergoing adenotonsillectomy.

**Keywords:** Adenotonsillectomy, Dexamethasone, Gabapentin.

## Introduction

Tonsillectomy is surgical removal of tonsils. It is usually combined with an adenoidectomy, which is

the removal of the adenoid. The combination of these two procedures is called an adenotonsillectomy. Adenoidectomy is uncommon

in adults in whom the adenoid is much smaller than it is in children and rarely causes problems. Although tonsillectomy is nowadays performed much less frequently than in the 1950s, it remains a common surgical procedure in children in the United States and many other western countries.<sup>1</sup>

The more important complications of this operation are intra- operative blood loss, post-operative hemorrhage and post-operative pain. Poorly controlled pain can result in increased catabolism, increased heart rate, blood pressure, respiratory rate, immune-suppression and coagulation disturbances. Pain and post-operative nausea and vomiting (PONV) prolong recovery, discharge time and contribute to unexpected readmission after outpatient surgery, also lead to poor patient satisfaction, impair quality of recovery and increase health care costs.<sup>2</sup>

Gabapentin is a first-line treatment for diabetic neuropathy and postherpetic neuralgia and for central pain. Gabapentin has been shown to bind to the  $\alpha 2\delta$ -1 subunit of voltage gated calcium ion channels, which contributes to its pain attenuation effects in diabetic neuropathy and post-herpetic neuralgia. Other neurophysiological findings indicate that gabapentin also interacts with NMDA receptors, and inflammatory cytokines. Its role in post- operative analgesia and control of post surgical pain is well established. Studies have evaluated its

role in management of pain following tonsillectomy.<sup>3</sup>

Dexamethasone is an anti inflammatory agent widely used in various conditions. It acts by inhibiting the production of arachnoid acid thus eliminating post operative pain.<sup>4</sup> The present study was conducted to assess the role of gabapentin and dexamethasone alone or in combination in the management of postoperative pain following adenotonsillectomy.

### Materials & Methods

The present study was conducted in the department of Anesthesia. It included 84 patients underwent adenotonsillectomy. All were informed regarding the study and written consent was obtained. Ethical clearance was taken from institutional ethical committee.

General information such as name, age, gender etc. was recorded. All were divided into 2 group of 42 each. Group I (42) received Gabapentin 10mg/kg 2 hour before induction of anesthesia. Group II received combination of both Gabapentin 10mg/kg 2 h before induction of anesthesia and 0.15 mg/kg dexamethasone after induction of anesthesia. In all groups, pain score was recorded. Results were tabulated and subjected to statistical analysis using chi- square test. P value less than 0.05 was considered significant.

## Results

**Table I** Parameters in both groups

Parameters	Group I	Group II	P value
Age (yrs)	24.6± 4.5	25.1± 5.2	0.21
Weight (Kg)	66.8± 8.2	64.0± 6.4	0.14
Duration of anesthesia (min)	34.6± 1.2	35.2± 1.6	0.5
Pethidine consumption (mg)	8.6± 4.8	5.4± 4.2	0.02
PONV (%)	25%	22%	0.1

Table I shows that mean age in group I was 24.6± 4.5 and in group II was 25.1± 5.2 years. Weight in group I was 66.8± 8.2 Kg and in group II was 64.0± 6.4 Kg in group II. Duration of anesthesia in group I was 34.6± 1.2 minutes and in group II was 35.2± 1.6 minutes. Pethidine consumption in group I was 8.6± 4.8 mg and in group II was 5.4± 4.2 mg. The difference was significant (P- 0.02).

Post- operative nausea and vomiting (PONV) was 25% in group I and 22% in group II. The difference was non- significant (P- 0.1).

**Table II** Pain score in both groups

Time	Group I	Group II	P value
2 hour	0.94±1.24	0.67±0.78	0.01
4 hour	1.42±1.62	0.95±0.22	0.02
6 hour	2.80±0.92	1.22±0.94	0.001
12 hour	5.52±0.22	4.62±1.25	0.05

Table II shows that pain score in group I was 0.94±1.24 and in group II was 0.67±0.78 after 2 hours, 1.42±1.62 and 0.95±0.22 after 4 hours in group I and group II respectively after 4 hours, 2.80±0.92 in group I and 1.22±0.94 in group II after 6 hours and 5.52±0.22 in group I and 4.62±1.25 in group II respectively. The difference was significant ( $P < 0.05$ ).

### Discussion

Tonsillectomy is still a controversial surgery as its benefits seem to be only modest and temporary in most cases, whereas there are some indications that tonsillectomy may compromise the immune system in the long run, especially when performed at a young age.

Gabapentin is thought to involve voltage-gated N-type calcium ion channels. It is thought to bind to the alpha 2\_ delta subunit of the voltage-dependent calcium channel in the central nervous system. This reduces calcium influx into the nerve terminals and decreases the release of neurotransmitters like glutamate.<sup>5</sup> The glucocorticoids block both the cyclooxygenase and the lipooxygenase pathway in the inflammatory chain reaction. Thus, these compounds may be effective in reducing pain. In present study we assessed the role of gabapentin and dexamethasone alone or in combination in the management of postoperative pain following adenotonsillectomy.<sup>6</sup>

In present study, group I received Gabapentin 10mg/kg 2 hour before induction of anesthesia. Group II received combination of both Gabapentin 10mg/kg 2 h before induction of anesthesia and 0.15 mg/kg dexamethasone after induction of anesthesia. We found that duration of anesthesia in group I was 34.6± 1.2 minutes and in group II was 35.2± 1.6 minutes.

Pethidine consumption in group I was 8.6± 4.8 mg and in group II was 5.4± 4.2 mg. Post-operative

nausea and vomiting (PONV) was 25% in group I and 22% in group II. This is in agreement with Jeon et al.<sup>7</sup>

A study by Sabry Mohammad Amin et al<sup>8</sup> in a double-blind randomized study, classified 120 children into three equal groups. Group G received Gabapentin, group D received placebo pre-operatively and received dexamethasone after induction of anesthesia, but before surgery and group C received combination of oral gabapentin and dexamethasone intravenously. Pain score was assisted post-operatively 2 h, 4 h, 6 h, 8 h, 12 h and 18 h after recovery using face, legs, activity, cry, consol ability scale. At 12 h, the pain score in Group C was significantly less than Group G and Group D ( $P < 0.05$ ). And no significant changes were observed in pain score at 18 h post-operatively between all groups ( $P > 0.05$ ).

Dirks et al<sup>9</sup> in their study of a randomized study of the effects of single-dose gabapentin versus placebo on post-operative pain and morphine consumption after mastectomy showed that oral premedication with oral 300 mg of gabapentin reduces post-operative pain and morphine consumption after abdominal surgery.

We found that pain score in group II was significantly lower than group I at 2 hours, 4 hours, 6 hours and 12 hours. This is in agreement with Fassoulaki et al.<sup>10</sup> Another potential benefit of steroid use is the apparent post-operative antiemetic effect by inhibiting the phospholipase enzyme.

### Conclusion

Author concluded that gabapentin along with Dexamethasone proved to be effective in controlling post operative pain in patients undergoing adenotonsillectomy.

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