

A Study of Effect of Steroids on Post-tonsillectomy Pain in Adults

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Abstract

Introduction: Dexamethasone has been used to reduce the pain in post-operative tonsillectomy. Evidence is there that how much dose to be used to bring this effect.

Objective: To compare the efficacy of two different doses of intravenous dexamethasone intraoperatively on pain after tonsillectomy.

Materials and Methods: A total of 40 adult patients of age between 18 and 45 years posted for tonsillectomy which was divided into two groups, and different doses of dexamethasone were given and were measured for 7 days at an interval of 6, 12, and 24 h using visual analog scale score.

Results: There was significantly no difference between the groups, but the second group of patients required less analgesic agent as compared to the first group.

Conclusion: This study shows a slight reduce in pain after use of 20 mg intravenous dexamethasone given intraoperatively while performing electrocautery tonsillectomy. The use of dexamethasone results in small amount of reduction of pain postoperatively, and hence, the use of it benefit and outweighs the risk of this practice.

Key words: Dexamethasone, Post-tonsillectomy, Visual analog scale score

INTRODUCTION

Dexamethasone has been used to reduce the pain in post-operative tonsillectomy. Evidence is there that how much dose to be used to bring this effect. Various studies have been compared using intra- and post-operative use of dexamethasone in children for tonsillectomy.¹⁻⁶ The limitations of this study were having a lack of control group, small study group, and invalid pain rating method.

Short-term doses of intraoperative steroids are used routinely by many surgeons especially when operating in the head and neck region, to reduce swelling and protect function. This type of protocol is believed to be safe in otherwise healthy patients.⁷⁻⁹

Dexamethasone

It is a type of steroid medication used in the treatment of many conditions such as rheumatic problems, skin problems, severe allergies, asthma, chronic obstructive lung diseases, croup, and brain swelling.

In preterm labor, it may be used to improve outcomes in the baby. It can be given orally or intravenously or intramuscularly. The effect is seen within a day and lasts for about 3 days.

Long-term use of the drug can cause oral thrush, bone loss, cataracts, muscle weakness, or easy bruising. It also has anti-inflammatory and immunosuppressant effects.

Post-tonsillectomy

Tonsillectomy is a procedure or surgery to remove tonsils. Nearly, everyone experiences pain after a tonsillectomy. The pain is most often in the throat and frequently in the ears. It gradually decreased with medication and time. Use of dexamethasone can decrease the uses of pain killers and also decreases the swelling of operated part due to its anti-inflammatory effects. Certain complications such

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as bleeding, fever, and dehydration can be seen in post-tonsillectomy patients.

Visual Analog Scale (VAS) Score

The VAS is a psychometric response scale, which can be used in questionnaires. It is a measurement instrument for subjective characteristics or attitudes that cannot be directly measured.

MATERIALS AND METHODS

Patients posted for tonsillectomy aged between 18 and 45 years were included in the study. Exclusion criteria were contraindicated for steroid use such as pregnancy, diabetic patients, and psychosis. Exclusion criteria includes contraindications for steroid use such as pregnancy, diabetic patients, psychosis & drug allergies for steroids and lack of cooperation for the study.

Patients were admitted to hospital on the day of operation and remain admitted to hospital for 2 days postoperatively. Pre-operative preparation: Anesthetic induction maintenance 7 recovery was standardized as per the hospital protocol.

Patients were randomized to receive either 8 mg of dexamethasone or 20 mg of dexamethasone intravenously. Both patient and surgeon were blinded as to which was received.

Tonsillectomy was performed as per standard protocol; 2% lignocaine with 1:200000 adrenalin was injected into tonsillar bed, and then, electrocautery was used to remove the tonsils. Hemostasis was achieved using pressure gauze and cautery.

Each patient was given tramadol nonsteroidal anti-inflammatory drug (NSAID) and paracetamol (PCT), intra and postoperatively. Patients scored their throat pain on VAS. They drew a vertical line of 10 cm where 0 was no pain and 10 was worst pain. As this is a well-accepted, validated method of pain measurement in knowing post-tonsillectomy pain.¹⁰⁻¹⁴

Analysis was done using Microsoft Excel and SPSS repeated measures were compared using analysis of variance, and non-repeated data were compared using *t*-test.

RESULTS

About 40 patients were enrolled and 35 of whom returned their data collection forms. 17 were randomized to the placebo group and 18 were randomized to the dexamethasone group.

No statistically significant differences between the group of sex, age, smoking status, and reason for tonsillectomy. Pain score is shown in Figure 1. Analysis of variance revealed no significant differences.

The dose of PCT and NSAID is shown in Figure 2, and there were no significant differences between the groups.

Around 11 patients (32%) in dexamethasone group and 10 patients (29%) in placebo group required no analgesic

Table 1: Characteristics of study groups

| Characteristics | Placebo group (n=14) | Dexamethasone group (n=15) |
|----------------------------------|----------------------|----------------------------|
| Sex | | |
| Male | 7 | 6 |
| Female | 7 | 9 |
| Age, mean, year (range) | 27.6 (17.2-52.8) | 26.9 (15.5-40.0) |
| Smokers (n) | 7 | 3 |
| Indication for tonsillectomy (n) | | |
| Recurrent tonsillitis | 13 | 15 |
| Tonsil lesion | 1 | 0 |

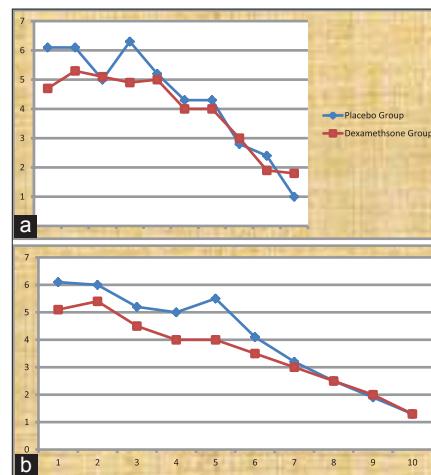


Figure 1: Comparison of pain score

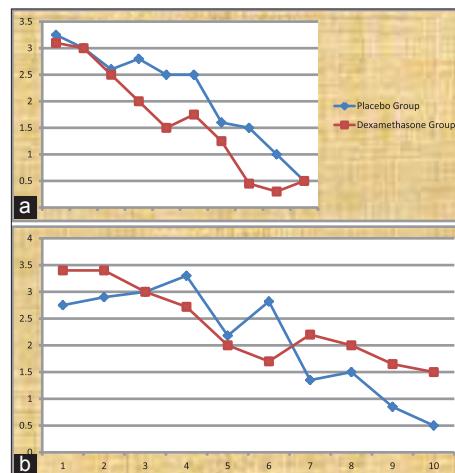


Figure 2: Comparison of analgesic used (PCT & NSAID) in post-operatively

Table 2: Summary of studies of dexamethasone use in pediatric tonsillectomy

| Study, year | Tonsillectomy method | N | Pain measurement | Steroid dose | Hemorrhagic events, (n) | Significant outcomes |
|---|----------------------|---------------|------------------------------------|--------------|-------------------------|--|
| Caflin and Grimes, ¹ 1991 | SD | S=10 NS=15 | Parental questionnaire | 8 mg | S=2 NS=1 | S=Normal diet sooner |
| Volk <i>et al.</i> , ² 1993 | SD | S=25 NS=24 | Parental questionnaire (scale 0-3) | 10 mg | S=2 NS=1 | No difference between groups |
| Ohlms <i>et al.</i> , ⁵ 1995 | SD | S=34 NS=35 | Faces scale (7 d) | 0.5 mg/kg | S=3 NS=0 | No difference between groups |
| April <i>et al.</i> , ⁴ 1996 | EC | S=41 NS=39 | Faces and Oucher scales (24 h) | 1 mg/kg | S=1 NS=1 | No difference in pain between groups; S=Less vomiting, normal diet sooner |
| Tom <i>et al.</i> , ³ 1996 | EC | S=26 NS=32 | Parental diary (10 d) | 1 mg/kg | S=1 NS=2 | S=Less pain, less vomiting, more tolerated normal diet on first day |

*SD: Sharp dissection, EC: Electrocautery, S: Steroid (dexamethasone) group, NS: No steroid (control) group

postoperatively. No significant difference between the groups for time to be able to tolerate normal diet or resume work.

No significant difference between smokers or non-smokers and between male and female found (Tables 1,2).

DISCUSSION

ENT surgeons use steroids because of anti-inflammatory actions. These are mediated by inhibition of production of inflammatory cell factors resulting in decreased lysosomal enzyme release extravasation of leukocytes and vascular permeability,⁹⁻¹⁵ ultimately reducing edema and decreasing fibrosis during healing.

Steroids have many physiological actions, and they exert an effect by binding to specific intracellular receptors that alter gene expression, blocking formation of some substances, and accelerating productions of others.

Well-known side effects include cataracts, avascular necrosis of bone, osteoporosis, hypertension, hyperglycemia, growth disturbances, mood and personality changes, and post-treatment adrenal insufficiency due to suppression.⁹

Dexamethasone is among the most potent glucocorticoids with 36 to 72 h of biological half-life, and it is 25 times as potent as endogenous cortisol.⁹ 10 mg of cortisol is secreted by an adult daily which is 0.4 mg of dexamethasone; thus, the dose chosen for study (20 mg) is very supraphysiological. Use of dexamethasone in correct dose for reduction of edema and inflammation in head and neck.⁶ Ideally, 1-1.5 mg/kg should be used intravenously.¹⁵

Steroids reduce the antiemetic effect in oncology patients.¹⁶ In this study, dexamethasone improved pain very slightly, but the use of analgesic decreased after the third day in dexamethasone group.

A significant difference of 2 cm on VAS in initial sample size calculation that was reasonable for biomedical research. Our study suggests that further study of steroid effect in first 12 h after post-tonsillectomy would be challenged. Splinter and Roberts⁶ said that vomiting episodes reduced in post-operative cases

CONCLUSION

This study shows a slight reduce in pain after use of 20 mg intravenous dexamethasone given intraoperatively while performing electrocautery tonsillectomy. The use of dexamethasone results in small amount of reduction of pain postoperatively, and hence, the use of it benefit and outweighs the risk of this practice.

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