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ORIGINAL ARTICLE

Preoperative administration of dexamethasone reduces post-tonsillectomy morbidities in adults

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Postoperative morbidity

Abstract *Aim:* To investigate the efficacy of dexamethasone on the quality of life in adult tonsillectomy patients in terms of postoperative nausea, vomiting, and pain.

Materials and methods: In this study, 106 adult patients of control and study groups were injected with 2 ml intravenous normal saline and dexamethasone in a dose of 0.3 mg/kg (maximal dose 8 mg), respectively, during the induction of anesthesia, prior to cold dissection tonsillectomy. Post-operative pain scores, incidences of nausea and vomiting, and the duration of oral intake were compared in both groups.

Results: The overall post-operative incidences of nausea and vomiting and pain scores of 74 patients were significantly less in the study group ($n = 43$) as compared to the control group ($n = 31$). The study group could intake liquid and solid foods earlier than patients of the control group.

Conclusion: Pre-operative administration of dexamethasone significantly reduces post-tonsillectomy morbidities such as nausea, vomiting, and pain with early resumption of oral intake.

1. Introduction

Tonsillectomy is an age old surgical technique commonly performed by surgeons worldwide in response to treatment of recurrent chronic tonsillitis, obstructive sleep apnea, and related conditions, tonsillar hypertrophy, snoring, or peritonsillar abscess.[1] The cold dissection method of tonsillectomy is highly preferred by surgeons as it allows a very thorough, careful, and effective removal of all lymphoid tissues. However, as the surgery causes mechanical tissue damage, the prevalence of associated complications and postoperative morbidities such as pain, emetic episodes, nauseatic feelings, dehydration, and poor oral intake are direct responses to this event.[2,3] Incidences

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of postoperative nausea and vomiting (PONV) are associated with severe pain causing local inflammation, venous hypertension, hemorrhage, and pulmonary aspiration.[4] Despite the availability of various analgesic and antiemetic regimens post-tonsillectomy, patient surveys have indicated that moderate-to-severe postoperative pain is still poorly managed.[5]

Results of many published clinical studies provide evidences regarding the beneficial effects of steroids with regard to decreasing episodes of nausea, vomiting and pain, following tonsillectomy.[6,7] Of all steroids, glucocorticoids have the most powerful anti-inflammatory characteristics. Administration of corticosteroid regimens has been proved to be safe and effective in managing mild-to-moderate postoperative pain management after tonsillectomy with no contraindications to their use.[8,9] Dexamethasone is a potential glucocorticoid drug that acts as an anti-inflammatory and immunosuppressive agent. The prolonged analgesic and antiemetic effects of dexamethasone help to improve the quality of life in adult patients post-tonsillectomy by reducing the tissue damage and local inflammation by blocking the inflammatory mediators, prostaglandin antagonism, release of endorphins, and tryptophan depletion. Many previously published studies have further confirmed that single, low dose intravenous administration of dexamethasone, prior to tonsillectomy, during the induction of anesthesia, considerably reduces postoperative morbidities such as pain, nausea, and vomiting, and improves quality of oral food intake.[10–13]

This study was conducted in an aim to investigate the efficacy of a single dose of dexamethasone administered intravenously prior to tonsillectomy, on postoperative nausea, vomiting, and pain on the quality of oral intake in a group of adult patients undergoing cold dissection tonsillectomy, using a standardized anesthetic and surgical procedure. Results obtained from the study and control groups were compared to determine if the preoperative administration of dexamethasone is beneficial in reducing postoperative morbidities.

2. Materials and methods

The current randomized controlled clinical trial was conducted at the Department of Otorhinolaryngology, Ain-Shams University Hospital, Egypt, during 2006–2011. The selection criteria for this study included adult patients of age 15–65 years, weighing 40–100 kg, ASA (American Society of Anesthesiologists) physical status I and II, undergoing elective tonsillectomy. Patients with suspected malignancy and those with contraindication in using non-steroidal anti-inflammatory drugs were excluded from the study. Thus, after obtaining approval from the hospital's ethics committee and informed consent from patients, a total of 106 adult patients (65 males and 41 females) were enrolled for the study.

For standardization of the study outcome, all surgeries were conducted by the same surgeon and anesthetic procedure was the same for all patients and was performed by one anesthetist. Patients were randomly, using sealed envelops, allocated into study and control groups (53 patients in each group), i.e., patients were randomized to receive either dexamethasone (study group) or an equivalent volume of normal saline (control group). General anesthetic procedure was followed by surgeons for both groups prior to the surgery. Patients of the study group received the corticosteroid dexamethasone (Decadron MSD) intravenously in a single dose of 0.3 mg/kg, maximal dose 8 mg, 15 min prior to start of the surgery, during the induction of general anesthesia while the control group did not receive any steroids. Patients of the control group were injected with the similar amount, i.e., 2 ml of normal saline solution during anesthetic induction. The cold dissection technique was followed for the tonsillectomy and general postoperative measures were standardized for both groups.

All patients were discharged after 24 h stay in hospital, post-tonsillectomy. Patients were prescribed with the following oral medication (analgesics and antiemetics), for relief from pain and vomiting, during and after their hospital stay, till seven days duration, post-surgery.

- Paracetamol tablets (1 g every 6 h)
- Diclofenac dispersible (50 mg every 8 h)
- Dihydrocodeine (30 mg every 6 h interval/day)

Patients were asked to fill in a written questionnaire, where they had to note the time of their first intake of solid and liquid food after surgery along with incidences of nausea, vomiting, and severity of pain each day, from the day of surgery till the next seven days. To determine the postoperative extent of pain in patients, the visual analogue scale (VAS) of pain scores was used where 0 represented no pain and 10 represented severe pain. Patients were asked to label a score of 0–4 for mild pain, 5–7 for moderate pain, and 8–10 for severe pain on the VAS. To assess the postoperative occurrences of nausea and vomiting (PONV) or incidences of emesis, patients were asked to note the number of emetic episodes per day. Three or less episodes per day were considered as mild PONV, four or more episodes per day were labeled as moderate PONV, and more than eight episodes per day were marked as severe PONV. Patients were also asked to note the postoperative duration of first liquid and solid oral food intake as the delay in postoperative oral fluid and solid intake as a result of nausea, vomiting, or pain prolongs the healing time and increases dehydration risks in early and late postoperative periods. Based on the comparison of these data, the difference in healing times between both groups could be determined. These details were collected from patients when they came to the hospital on the seventh day for their follow-up check-up.

3. Statistical methods

Data analysis was performed using the SPSS® (Statistical Package for the Social Sciences) software, version 17.0. The data were expressed as mean (standard deviation – SD) for normally distributed data and median (inter-quartile range – IQR) for non-normally distributed data. Mean and standard deviation were calculated for age and weight of these 74 patients. The Kolmogorov–Smirnov test was used to test normality of the distribution. Paired *t*-test and Wilcoxon Signed rank test were applied to examine statistically significant differences between the two groups for severity of pain and incidences of PONV on the day of operation and till seven days post-operation. *P* values less than 0.05 were considered to be statistically significant.