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PAIN MANAGEMENT: EFFECT OF CHEWING EXERCISES IN POST TONSILLECTOMY PATIENTS

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ABSTRACT

Objective: To assess the effect of chewing in addition to pharmacological management of post-tonsillectomy pain and return to the normal diet.

Methodology: To determine the impact of chewing gum on post-operative pain, a 12-month comparative cross-sectional study was carried out on 87 post-tonsillectomy patients at the Pakistan Institute of Medical Sciences (PIMS) Islamabad. Two groups of patients having elective tonsillectomy were created: Group A (chewing gum) and Group B. (routine care). Following surgery, patients were monitored to assess postoperative pain using a Visual Analogue Scale (VAS) from day 1 to day 7 and resume their regular diet.

Results: Out of 87 patients, 49 (56.3%) belonged to group A, and 38 (43.7%) belonged to group B. Mean age of the participants was 23.8±5.2 years. The total number of male and female participants was 56 (64.4%) and 31 (35.6%) respectively. There was significantly lesser pain experienced by patients in group A as compared to group B from day 2 through day 5 ($p < 0.001$), whereas there were no statistically significant differences observed between the two groups on the 1st, 6th and 7th post-operative days in terms of post-op pain ($p = 0.589, 0.516, 0.376$). In terms of resuming a normal diet, there was no statistically significant difference between the two groups. ($p = 0.456$).

Conclusion: Postoperative use of chewing exercises significantly decreases pain in the immediate post-tonsillectomy period and is recommended for use as a non-pharmacological adjunct for post-tonsillectomy pain management.

Keywords: Pain management; Post-Operative; Tonsillectomy

INTRODUCTION

Tonsillectomy is a surgical procedure in which the palatine tonsils are removed. Palatine tonsils are two in number, oval-shaped pads of tissue sitting at the back of the throat in the tonsillar fossa bilaterally between anterior and posterior tonsillar pillars. Tonsillectomy is mainly done for recurrent tonsillitis; a condition characterized by repeated infection and inflammation of the tonsils. This means that when tonsillar infection occurs repeatedly, with failure of response to pharmacological treatment, it eventually results in enlargement of the tonsils causing difficulty in eating and breathing. At this point, surgical removal of the tonsils is the only treatment method left. Tonsillectomy is also performed in cases of sleep-disordered breathing e.g., obstructive sleep apnea. Tonsillectomy may also be done for other problems caused by enlarged tonsils and to treat some rare diseases of the tonsils. Recovery time post-tonsillectomy is usually at least between 10 to 14 days.¹

Tonsillitis is a frequent cause of a visit to the out-

patient department (OPD) and is said to make up approximately 1.3% of total OPD visits.² Tonsillectomy accounts for almost 20-40% of surgical procedures done in otorhinolaryngology thus making it one of the commonest surgeries done in this specialty.^{3,4} Post-tonsillectomy pain is a frequent complaint encountered during the early postoperative phase. The pharmacological management includes Non-steroidal anti-inflammatory drugs (NSAIDs) which are the current mainstay for post-tonsillectomy pain management, but analgesics alone only incompletely relieve pain. In a study conducted by Moir MS et al, it was concluded that there was no difference in the level of pain control provided by acetaminophen or acetaminophen and codeine combination with pain being experienced up to seven days postoperatively.⁵ An article published by Cohen et al, described various non-pharmacological interventions such as aromatherapy and the usage of honey for post-tonsillectomy pain control.⁶ A study from Pakistan, conducted by Hasnain et al compared the analgesic effects of ketamine and morphine and it was concluded that the analgesic effect of ketamine

and morphine was statistically insignificant ($P>0.05$) in post-operative tonsillectomy cases in the pediatric age group.⁷ Trends in the pharmacological management of post-tonsillectomy pain have also changed over time, with the focus shifting from acetaminophen use previously to ibuprofen in recent years.⁸ Therefore, there is a need to also focus on non-pharmacological interventions for the management of post-tonsillectomy pain. In routine practice, otorhinolaryngologists routinely advise their patients to start eating early and frequently during the initial post-tonsillectomy period. This is because chewing is postulated to promote mastication movements and helps in deglutination, increasing the action of the pharyngeal muscles. Also, this movement is said to produce a washing effect which decreases the chances of acquiring post-operative infections and speeds up the healing process.

In this study, we aimed to assess the additional effect of chewing, if any, on post-tonsillectomy pain management and return to the normal diet, as an indirect indicator of healing, in patients undergoing elective tonsillectomy at our setup.

METHODOLOGY

After receiving formal ethical approval from the Shaheed Zulfiqar Ali Bhutto Medical University Ethical Review Committee with letter number. F. 1-1/2015/ERB/SZABMU/538, this comparative cross-sectional study was developed and carried out at Pakistan Institute of Medical Sciences Islamabad. All patients between the ages of 15 and 35 who are having elective tonsillectomy for recurrent tonsillitis at the ORL/HNS department. For the cross-sectional study design, the sample size was determined using the WHO sample size calculator. 20 people were determined to be the minimum sample size for this investigation, taking into account that tonsillitis 2 accounted for 1.3% of outpatient visits with a 95% degree of confidence and

80% study power. Patients with comorbidities, immediate post-operative problems such further bleeding that required re-intervention, chronic illness conditions, and patients at high risk for general anaesthesia were excluded from the study. Before the procedure, patients gave their informed consent to take part in the study. The same group of otorhinolaryngologists used the same method for all of the procedures.

Patients were divided into two groups, A and B. Patients in group A were additionally advised to chew gum, while patients in group B were advised only routine post-operative care. Subjects in group A were asked to chew a piece of fruit-flavored gum for a minimum of 20 minutes, 4 times a day, every 6 hours postoperatively up to post-op day 7 in addition to regular post-operative advice. Subjects in group B were provided with only routine post-operative advice. Regular post-tonsillectomy dietary advice was given to both groups to help them start their normal habitual diet as soon as possible. Patients in both groups were prescribed standard analgesic NSAID as per the recommendation of The American Academy of Otolaryngology-Head & Neck Surgery dosing of ibuprofen at 5–10 mg/kg/dose every 6–8 hours 8 postoperatively from post-op day 1 to day 7. Patients were observed for outcome assessment on the 7th postoperative day.

Visual Analogue Scale (VAS) 9 for pain was used to measure postoperative pain in which patients were asked to mark perceived pain along a 100 mm horizontal line with measurements starting from 0 up to 100 in multiples of 10. The rating was measured from the left edge of the line for each day from post-op day 1 to day 7. The scale was 100 mm long, measurable to the nearest millimeter. The range of scores was from 'no pain at all' to the 'worst possible pain'. having values of 0, 10, 20, and 30 up to 100. The data was entered and analyzed using the SPSS version 23. Descriptive sta-

tistics were reported as frequencies and percentages for categorical variables while the mean and standard deviation was reported for continuous data. The mean pain score was compared between two study groups by applying independent samples T-test to demonstrate any significant differences in pain scores. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Eighty-seven post-op tonsillectomy patients fulfilled the inclusion criteria and were enrolled in the study. The mean age of the participants was 23.8 ± 5.2 years. Out of the total 87 participants, 56 (64.4%) were male and 31 (35.6%) were female. Group A (chewing gum) included 49 (56.3%) patients while 38 (43.7%) were included in group B (routine care). The baseline demographic characteristics are summarized in table 1. The mean VAS pain score on postoperative day 1, was 68.5 ± 20.2 for group A, and for group B it was 73.6 ± 14.0 with no significant difference ($p= 0.187$). On post-op day 2, the mean VAS pain score for group A was 48.16 ± 14.9 , whereas 61.84 ± 16.4 for group B, and there was a significant difference in mentioned pain scores ($p<0.001$). This finding shows that the patients belonging to group A (chewing gum) experienced lesser pain as compared to those belonging to group B (routine care). Similarly, on post-op day 3, the mean VAS pain score was 29.59 ± 11.7 and 40.53 ± 14.3 respectively for groups A and B, with a statistically significant difference ($p<0.001$) again showing that chewing gum decreased the intensity of pain postoperatively. On post-op day 4, the mean VAS pain score for group A was 9.80 ± 10.7 while for group B it was 14.47 ± 11.7 with a statistically significant difference ($p=0.05$). On post-op day 5, the mean VAS pain score was 2.04 ± 5.3 for group A and 5.79 ± 8.8 for group B again showing a statistically significant difference ($p=0.017$). Thus, chewing gum significantly

reduced pain post-operatively starting from day 2 through day 5. The mean VAS pain scores for days 6 and 7 were 0.82 ± 3.4 vs 0.79 ± 2.7 and 0.20 ± 1.4 vs 0.00 ± 0.00 for groups A and B respectively, showing no statistically significant difference ($p=0.969$ and 0.382 respectively). The post-tonsillectomy pain score trend for day 1 to day 7 is shown in figure 1.

Regarding starting the normal routine

diet, 21(42.8%) patients from group A started their normal diet on day 1, 25(51%) on day 2 and 3(6.1%) on day 3 while 13 (34.2%), 20 (52.6%) and 5 (13.15%) patients from group B started the normal diet on post-op day 1, 2 and 3 see Table 2. In terms of resuming a normal diet, there was no statistically significant difference between the two groups. ($p=0.456$). The average day of the return to normal diet was 2nd postoperative day in both groups.

Table 1: Comparison of baseline demographic characteristics between two study groups (n = 87)

Demographic characteristics		Group A (n = 49)	Group B (n = 38)
Mean Age (mean ± SD) in years		23.6 ± 5.5	24.2 ± 4.9
Gender	Males	33 (67.3%)	23 (60.5%)
	Females	16 (32.7%)	15 (39.5%)
Baseline pain score after surgery		68.5 ± 20.2	73.6 ± 14.0

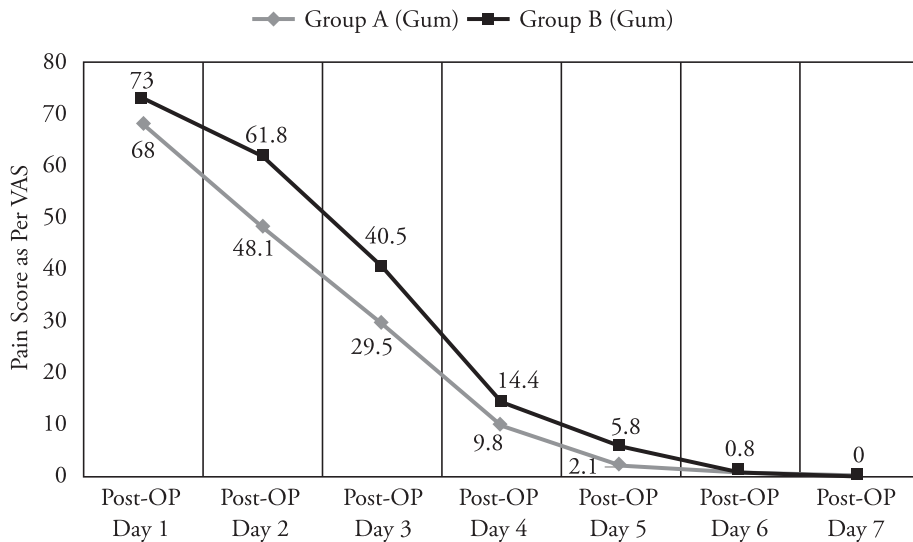


Figure 1: Comparison of post op pain between group A and B at post-op days 1-7

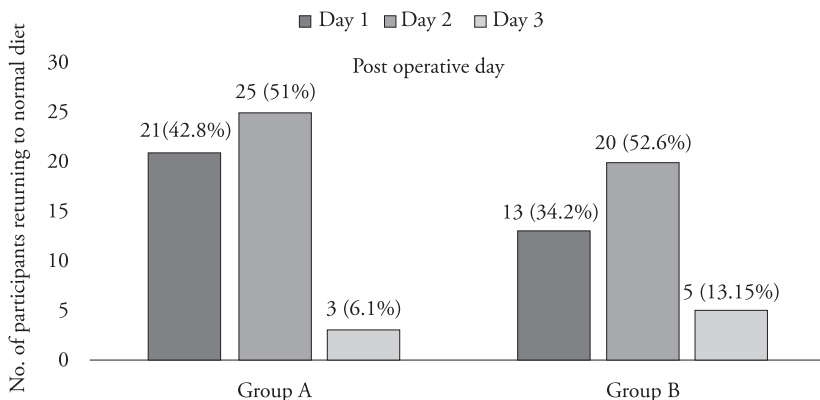


Figure 2: Comparison of return to normal diet among patients of group A and B (n=87)

DISCUSSION

Post-tonsillectomy use of chewing gum in addition to regular pharmacological pain management significantly decreases pain from day 2 to day 5. An article authored by Cohen N et al 6 showed that in addition to pharmacological management, non-pharmacological management may also be beneficial in decreasing post-tonsillectomy pain and likely helps in recovery. Research on this specific topic has been lacking, and the literature available shows variable results with some supporting our results and others contradicting our results.

Chewing exercises have been advocated by a significant segment of otorhinolaryngologists in post-tonsillectomy patients on the presumption that it would help in postoperative pain management.¹⁰ The results of our study show that chewing gum significantly decreases postoperative pain.¹⁰ Schiff, back in his study in 1982¹¹ reported that chewing gum helps relieve post-operative pain and discomfort which was in accordance with our results. This was contradicted by an article published by J. Hanif et al. in 1999¹² and is probably the most cited article in this regard.

The article had a similar query as our study, but a basic difference in methodology was the likely cause of a contradicting result to our study, which concluded that chewing gum doesn't have any significant effect on postoperative pain from day 1 to day 6 and rather increases pain on day 7. The authors of the aforementioned study used acetaminophen for postoperative pain control, while the current recommendation is ibuprofen. Also, there was a delay in return to normal diet in the chewing gum group in their study while in our study there was no significant delay noted in either group. The authors Schaller and Parkin et al¹³ in their analysis included that there is no significant effect of post-operative dietary advice in

terms of pain and recovery, which supports our idea that mastication and its effects, as done by chewing gum in our study was the factor directly beneficial for post-tonsillectomy pain management.

As per the results of our study, it can be very well appreciated that there is a sequential decrease in perceived pain as the post-operative days progress and the decrease is statistically more in those patients who chewed gum post-operatively, without any associated adverse effects. Therefore, the authors recommend the use of chewing exercise in the immediate post-tonsillectomy period as an adjunct to the currently recommended pharmacological management of pain. The absence of inclusion of the younger pediatric population (<15 years) and relying on patients to document the pain on VAS which was done in absence of the supervising doctor it's one of the limitations of current study.

CONCLUSION

In summary, post-operative use of chewing exercise significantly decreases pain in the immediate post-tonsillectomy period and is recommended to be used as a non-pharmacological adjunct for post-tonsillectomy pain management.

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Author's Contribution

NK conceived the idea, designed the study, and assisted in data collection. NK also wrote the initial manuscript. AH provided valuable input during the revision process and reviewed the manuscript for accuracy and clarity. SK played a significant role in data collection and analysis, and also contributed to writing the manuscript. Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Conflict of Interest

Authors declared no conflict of interest

Grant Support and Financial Disclosure

None

Data Sharing Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.