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
and morphine was statistically insignificant (P>0.05) in post-operative tonsillectomy cases in the pediatric age group. 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. 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 anesthesia 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 statistics were reported as 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
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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

\begin{table}[h]
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\begin{tabular}{|c|c|c|}
\hline
Demographic characteristics & Group A (n = 49) & Group B (n = 38) \\
\hline
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 \\
\hline
\end{tabular}
\caption{Comparison of baseline demographic characteristics between two study groups (n = 87)}
\end{table}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure1.png}
\caption{Comparison of post op pain between group A and B at post-op days 1-7}
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\begin{figure}[h]
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\includegraphics[width=\textwidth]{figure2.png}
\caption{Comparison of return to normal diet among patients of group A and B (n=87)}
\end{figure}
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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.

REFERENCES


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.