

## POST-OPERATIVE PAIN MANAGEMENT OF TONSILLECTOMY PATIENTS; CLINICAL EVALUATION OF USING ORAL HONEY IN 78 PATIENTS

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**ABSTRACT: INTRODUCTION:** Tonsillectomy is a commonly performed ENT surgical procedure in the age groups of 7 to 40 years, for various indications like recurrent post infection Hypertrophy of Tonsils, Sleep apnea and 4 weeks following Peri-tonsillar abscess and cysts or tumors of the tonsil. The children tolerate post-operative pain better than adults. Apart from Cold steel dissection and snare method different modalities are used for tonsillectomy like Laser, Coblation, radio-frequency; In an attempt to minimize post-operative pain in patients. The post –operative pain is usually managed by NSAID drugs like diclofenac sodium, ketorol, ibuprofen and acetaminophen given over a period of 7days after surgery. Many patients in addition to the pain at the site of surgery complain of dryness of the throat, radiating pain to the jaws and ears. They also complain of sharp lancinating pain with every swallow. The post-operative healing process is important following tonsillectomy because unattended it would lead to morbid recuperation post surgically. In view of varying responses to the standard treatment with NSAIDs by the individuals undergoing tonsillectomy the present study is conducted to evaluate post tonsillectomy pain and other associated morbid symptoms. Honey is used since time immemorial for medicinal purposes. It is described in Indian Medicine, Unani medicine, Chinese medicine to name a few. It has nutritive value as well as healing properties when applied to wounds. Use of Bees honey or its products is called Apitherapy which is a science by itself. To name a few varieties Tualang honey, Manuka Honey and Indian Honey and Chinese Honey. Honey is prepared by honey bees from the natural sugar solutions called the nectar obtained from flowers or other secretions of plants and contains mixture of sugars. By addition of enzymes and evaporation of water in it, honey bees transform it into a sweet liquid. It was the sweetening agent known to the early man, and naturally found its way into traditions, rituals, customs and food of Indian households. It is the most complete natural food and ensures to get the daily doses of essential nutrients like, carbohydrates, minerals, amino acids, proteins and vitamins. (7)Honey provides 3000 calories per kilogram and a table spoon of honey provides 100 calories. In this study the patients are given 10ml oral honey 6th Hourly with the help of subjective description as well as VAS. **METHODOLOGY:** Study includes 78 patients divided into 2 groups, one group receiving honey in addition to parenteral antibiotic, Diclofenac sodium, and acetaminophen. The patients are divided into two groups consisting of 39 each. Group 'A' patients consisted of Tonsillectomy patients receiving Honey available from super markets, in addition to parenteral antibiotic, Diclofenac sodium, and acetaminophen. The group 'B' consisted of Patients who were treated with only parenteral antibiotic, Diclofenac sodium, and acetaminophen. The severity of pain is measured in both the groups from day 1 to 8 using VAS. In addition other morbid symptoms are also evaluated by using a questionnaire. **RESULTS:** Group B had a significant low scales of VAS from day 1

## ORIGINAL ARTICLE

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to 4 when compared to Group A ( $p < 0.05$ ). From day 5 onwards there was no significant difference in the VAS scales of both the groups. ( $p < 0.1$ ).

**KEYWORDS:** Honey, Tonsillectomy, Post-operative pain, VAS, Sweetening agent, Referred pain to the ears, NSAIDS, Pain management, Co morbid symptoms of Tonsillectomy.

### INTRODUCTION:

**MATERIALS AND METHODS:** 78 patients undergoing Tonsillectomy in the Department of ENT were selected according to the inclusion criteria and exclusion criteria laid down by the authors for this study.

### INCLUSION CRITERIA:

1. Tonsillectomies done in patients with more than 5 to 6 attacks of throat infections per year.
2. Chronic Tonsillitis.
3. Peri-tonsillar abscess (Interval tonsillectomy).
4. Obstructive sleep apnea.
5. Patients aged between 7 to 40 years.

### EXCLUSION CRITERIA:

1. Patients aged below 7 years and above 40 years.
2. Tonsillectomy combined with Adenoidectomy.
3. Diabetic patients.
4. Tonsillectomy done with other the cold steel dissection method.
5. Patients with infection and bleeding.

The patients are divided into 2 groups 39 in each. Group A patients following Tonsillectomy were given parenteral antibiotic (Ceftriaxone sodium) 500 to 1000mgs depending upon the bodyweight, Parenteral NSAID (Diclofenac sodium) and or Ketorol. The patients of both the groups are given Acetaminophen in oral formulation instructing them to take a dose of Acetaminophen (Dose is fixed according to the age 250mg to 1000Gm) whenever they feel the pain not tolerable, for a period of 8 days. In addition group A patients were given 10 ml of pure honey available from super markets 4<sup>th</sup> hourly during the period of awake.

Group B patients were treated with parenteral antibiotic (Ceftriaxone sodium) 500 to 1000mgs depending upon the bodyweight, Parenteral NSAID (Diclofenac sodium) and or Ketorol. The patients of both the groups are given Acetaminophen in oral formulation instructing them to take a dose of Acetaminophen (Dose is fixed according to the age 250mg to 1000Gm) whenever they feel the pain not tolerable, for a period of 8 days. From day 1 to Day 8 the Visual Analogue scales (VAS) are applied in obtaining subjective assessment of pain in the throat, sharp pain with each swallow, dryness of the throat and radiating pain to the jaws and ears. The number of painkillers taken daily, Number of awakening due to pain is taken as objective assessment. The amount of healing in the form of epithelialization is judged by examining the tonsillar fossae for the rate of healing of mucosa. The observations are analyzed by using SPSS17 software and statistical tests.

**OBSERVATIONS:** 78 patients undergoing Tonsillectomy for different indications between the age groups of 12 to 40 were included in the present study conducted at Government General Hospital,

## ORIGINAL ARTICLE

Kurnool. The pain related symptoms and other morbid symptoms were assessed with the help of a questionnaire and VAS scale. The resident of Internal Medicine, operating surgeons and the Residents of ENT were involved in eliciting the degree of pain and other related symptoms like, Pricking pain with each swallow, radiating pain to the jaws and Ears and dryness of the Throat. These are measured with VAS scale for the entire post-operative period of 8 days. Patients were shown pictorial VAS score cards allowing them to point to the picture which best suits their level of pain.

As the symptoms felt were more during the first 4 days compared to remaining 4 days the VAS score is reflected in two tables after taking simple arithmetic average. The remaining symptoms like period of awakening, feeling of thirst, desire to clear the throat and feeling of lump in the throat are recorded in a questionnaire. The epithelial healing is assessed by daily examination by the surgeon operated with the help of head light and Sinus Endoscope. These observations are recorded accordingly in a separate chart in both the groups. All the patients underwent Cold steel dissection and snare method for Tonsillectomy. Bleeding points ligated with Cotton thread after clamping. Patients with any event of infection or bleeding in the post-operative period were excluded from the study.

	A	G	R	O	U	P	B	G	R	O	U	P		
	VAS score	vas	vas	vas	vas	vas	vas	vas	vas	vas	vas	Vas	Chi square	P value
Symptom	<5	6	7	8	9	10	<5	6	7	8	9	10		
Pain at the operation site	12	10	9	3	4	1	3	9	11	10	7	8	10.1	0.03
Pricking pain with each swallow	11	10	9	3	5	1	2	10	9	9	7	2	9.55	0.04
Radiating pain to Jaws and Ears	9	5	14	6	3	2	2	6	7	9	9	8	10.2	0.03
Dryness of the throat	9	10	13	5	1	1	3	6	7	10	9	4	12.6	0.01

**Table 1: Arithmetic mean of VAS score from day 1 to 4 in group A & B : n = 39X2**

**(The result is significant at p value <0.05).**

The chi square statistic for the symptom pain at the operation site is 10.1955 p value is 0.037261. The result is significant at p value <0.05. Similarly for the symptom pricking pain with each swallow chi square statistic is 9.5525 and p value is 0.04868. For the symptom radiating pain in jaws and ears 10.2838 and p value is 0.03599; significant at p value <0.05. For Dryness of the throat: Chi square value: 12.6027; p value 0.013389.

## ORIGINAL ARTICLE

	A	G	R	O	U	P	B	G	R	O	U	P		
	VAS score	vas	vas	vas	vas	vas	Vas	vas	vas	vas	vas	vas	Chi square	P value
<b>Symptom</b>	<5	6	7	8	9	10	<5	6	7	8	9	10		
Pain at the operation site	5	8	9	8	5	4	2	5	5	9	10	8	6.83	0.14
Pricking pain with each swallow	3	9	11	8	6	2	2	4	9	7	9	8	2.47	0.64
Radiating pain to Jaws and Ears	3	5	9	8	9	5	2	6	7	9	8	7	0.59	0.96
Dryness of the throat	4	6	8	7	9	5	3	4	6	8	8	10	0.56	0.96

**Table 2: Arithmetic mean of VAS score from day 5 to 8: in group A & B: n=39X2;  
(Significant with p value at 0.05)**

Pain at the operation site Chi: 6.8352; p: 0.144 not significant with p value at 0.05. For Pricking pain during swallowing the chi square value is 2.4796; p-0.64828. For radiating pain to jaws the chi value is 0.5985 and p-0.9632. For Dryness: chi-0.5608 p- 0.96732.

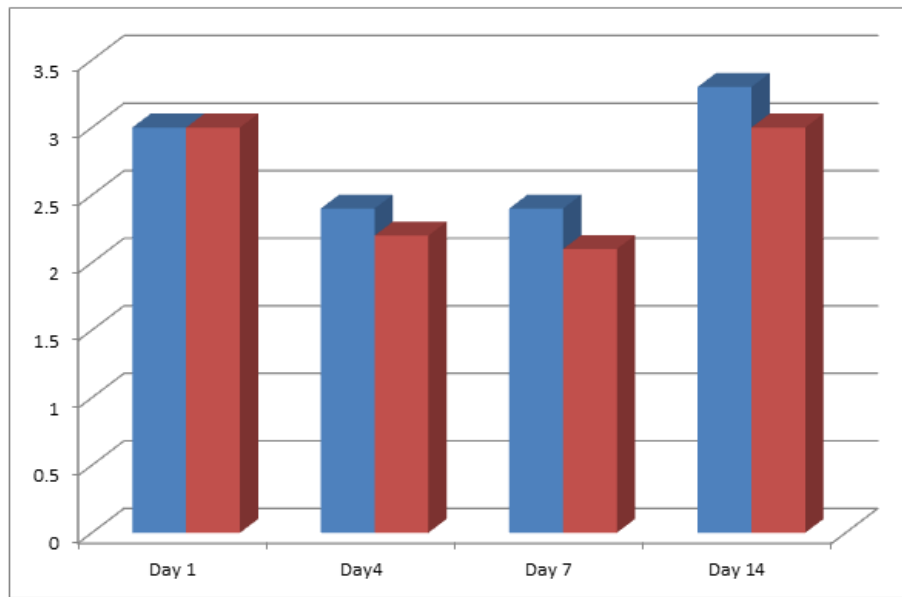
Symptom	Group A	percentage	Group B	Percentage
Awakening From sleep	17	43.58	22	56.41
Feeling of thirst	18	46.15	21	53.84
Desire to clear the throat	12	30.76	19	48.71
Feeling of lump in the throat	10	25.64	17	43.58

**Table 3: Table showing the morbid symptoms in Group A & B n=78: 2X39**

By calculating T value for these independent mean values by using SSS calculator the student T value is 2.4699 and the p value is 0.48 which is significant with p at <0.05.

Patients were monitored by examining the tonsillar fossae on days 1, 4, 7 and 14 for recording different changes in the fossae. They are staged as:

1. Completely covered with fibrin layer.
2. Epithelialization starting (<30%).
3. Semi epithelialization (30-75%).
4. Near total epithelialization (>75%).
5. Complete epithelialization.



Bar diagram showing Mucosal healing in Group A & B n=78: 2X39

Fibrin formation in both tonsillar fossae showed no difference among the two groups on Day 1; 76.92% in both the groups. On day 4 >30% epithelialization was seen in 61.5% in Group A and 56.40 in group B. On day 7 >75% of epithelialization is seen in 61.5% in group A and 53.84 in group B. On Day 14 complete epithelialization is seen in 84.61% in group A and 76.92% in group B. Applying Statistical analysis the Chi -square statistic is 0.357. The p value is 0.94897. The result is not significant at  $p < 0.05$ .

**DISCUSSION:** Tonsillectomy is a commonly performed surgery in ENT practice for various indications, to name a few are 1. Chronic Follicular or parenchymatous tonsillitis with more than 4 to 5 attacks 2. Interval tonsillectomy for Peri tonsillar abscess 3. Chronic Adeno tonsillitis in children aged 7 to 17 years 4. Tonsillar cysts 5. Benign tumors of Tonsil 6. Lymphoma of the Tonsil. 7. Tonsillolith 8. Foreign body impacted in Tonsil 9. As an approach for styloid process excision and IX cranial nerve for IX nerve neuralgia. 10. To remove as a focal septic focus in Scleritis, Glomerulonephritis, CSOM and Sinusitis. The primary focus of the patient after accepting the surgery is the amount of pain and related symptoms he would face after the surgery. Children tolerate the pain well when compared to the adults; This is an experience shared by all the ENT surgeons. Despite use of advanced methods in undertaking the tonsillectomy procedure (Studies showing lesser pain experienced by the patients with these methods) by Laser, Radio frequency technique, Coablation, microdebrider, cryosurgery and use of harmonic scalpel technique, pain when not controlled remains the main hurdle in delayed food and water consumption.<sup>1</sup> Pathma Letchumanan et al quote that other medical treatments are tried in the immediate post operative period to alleviate the pain after surgery, using acetaminophen as frequently as possible at the onset of pain, using Betamethasone orally, using fibrin glue into the tonsillar fossae immediately after tonsillectomy, using gabapentine, and use of fusa fungine. Various properties of honey are discussed in the literature from the time immemorial in the treatment of respiratory diseases and wound healing.<sup>2-6</sup> The anti inflammatory

## ORIGINAL ARTICLE

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properties, anti-oxidant properties, anti ulcerogenic, anti hepatotoxic, anti liliidomic and anti allergic properties are well documented and reviewed in literature. The pain following Tonsillectomy is due to open wound, repeated onslaught of salivary swallowing movement, spasm of pharyngeal muscles and irritation of open nerve endings following dissection.

A continuous exposure of honey onto the fossae like in wound dressing would help in assessing the action of honey, But it is not possible. Hence frequent administration of honey is advised in the present study. In the present study there is statistically significant alleviation of pain from day 1 to 4 in the Group A patients compared to Group B patients. The p value is  $<0.05$ . But the significance is not present between day 5 to Day 8; the p value is  $>0.05$ . Similarly the co morbid symptoms like Awakening from sleep, Feeling of thirst, Desire to clear the throat and feeling of lump in the throat are significantly lower in Group A than in Group B. The p value is  $<0.05$ . Whereas the epithelialization shows no statistical significance. The p value is  $>0.05$ .<sup>7</sup>

Hebbi et al quoted that Honey administration after tonsillectomy has valuable effect in pain relief and it can be used as an adjunctive regimen after surgery for better pain control. In their study it was observed that Pain comparison between two groups showed that the average time required for pain relief in patients who received honey was less than the control. The pain intensity was higher during the first 9 days post-operatively in control group. Results also showed that acetaminophen consumption in patients who received honey is lower. In the case group, the average time to resume regular diet and the frequency of awakening at night is significantly less than the control group.<sup>8</sup>

Tualang honey has been shown to accelerate wound healing in postoperative patients. They administered honey locally immediately after dissection followed by oral honey and found that the wound healing was significantly faster in the treatment group in both tonsillar fossae compared to the control group (left: p-value =  $<0.001$ ; right: p-value =  $<0.001$ ).<sup>9</sup> Boroumand et al in their study observed that the difference between acetaminophen and acetaminophen plus honey groups was statistically significant both for visual analogue scale (VAS), and number of painkillers taken within the first three postoperative days. The consumption of painkillers differed significantly in every five postoperative days. No significant difference was found between groups regarding the number of awaking at night. A report from 2<sup>nd</sup> International Conference on the Medicinal Use of Honey on 13-15 January, 2010, Kota Bharu, Kelantan, Malaysia; Honey a Potential Treatment for Lupus. Cancer, AIDS by Dr. Nor Hyati Othman; are of the opinion that honey is a (Mānuka honey) mono floral honey produced in New Zealand and Australia from the nectar of the mānuka tree. Honey has demonstrated antibacterial properties in vitro but there is no conclusive evidence of benefit in medical use. It is classified under therapeutic goods in Australia. Honey in general received approval in wound management from the US Food and Drug Administration in 2007.<sup>10</sup> Chemical composition of Honey: It is composed of water, sugar (levulose, dextrose, sucrose, dextrin), ash (minerals like calcium, iron, phosphate and manganese), about 8 components of vitamin B complex (Pantothenic acid, Biotin, Pyridoxine, Choline, Ascorbic acid, Thiamine, Riboflavin and Niacin). Besides it contains formic acid as the preservative. The color, flavor and odor of honey depend on the flowers from which the nectar is gathered. It is easily digestible.<sup>11</sup> Samet Ozlugedik et al concluded that oral administration of honey following pediatric tonsillectomy may relieve postoperative pain and may decrease the need for analgesics. The Egyptians utilized honey to aid in wound healing starting thousands of years ago. The Greek father of medicine Hippocrates also promoted the use of honey for the cleansing of sores. In the second half of the twentieth century, Western scientists began studying honey and have documented



## ORIGINAL ARTICLE

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its antibacterial and antifungal properties. It has also proven advantageous in clinical trials for the treatment of surgical wounds. The surgeons of North Carolina Eye, Ear, Nose & Throat who perform over 200 procedures a year, the prevalence of significant postoperative pain and the need for postoperative analgesic medication is well documented. According to them the pain is often incompletely controlled with commonly-prescribed medications such as Tylenol and narcotics. In addition pain medication can result in side effects such as nausea, constipation, and sedation. The authors of a recent study published in the Anesthesiology and Pain Medicine journal hypothesized that honey may speed wound healing and reduce pain levels in children after tonsillectomy. They included children ages 8-15 years who underwent tonsillectomy.

The children received acetaminophen (The ingredient in Tylenol) and were randomly assigned to receive either 1 teaspoon of honey or the same amount of simple sugar syrup with a similar consistency. Neither the doctors nor the patients knew which treatment the children were receiving. Treatment continued for five days, and the parents were asked to record subjective pain scores and the amount of acetaminophen given. For the first three days, pain scores were significantly lower in the honey group, and for all five days, the amount of pain medication given was lower in the honey group. These are certainly interesting results for those of us who perform tonsillectomy, and it suggests that honey may be a reasonable addition to traditional pain medication for our patients. The authors do note that certain groups, such as infants and diabetics, would not be good candidates due to the potential for harm from ingesting honey, but for the majority of children, this may be a good option.

**CONCLUSIONS:** The present study shows that Oral Honey when used in Post Tonsillectomy patients from Day 1 post operatively 4<sup>th</sup> hourly till Day 8<sup>th</sup>, has reduced the pain at the operation site, pricking sensation in the throat, Radiating pain to the jaws and dryness of the mouth significantly to the 4<sup>th</sup> post-operative day (p value is <0.05). It has minimized the doses of intake of acetaminophen (p value is < 0.05). It has also reduced the co-morbid symptoms like awakening from sleep; desire to clear the throat frequently and feeling of lump in the Throat during the same period.

Changing pain intensity can be measured over short time intervals using the visual analog scale. However, these measurements may not be as useful when studying differences between people since pain perception is subjective. These would depend upon age and gender.

In the medical profession use of the visual analog scale is questioned because of its lack of reproducibility. The subjective nature of pain creates a problem because there is no standard starting point for measuring "mild" or "severe" pain. VAS Scores may tend to vary over longer periods of time. This means that the same person may have a low score on the scale one day and a higher score the next day for the same pain intensity. However, if the pain intensifies in a matter of minutes, then the visual analog score would reflect this increase more accurately.

This study included the co-morbid symptoms also along with the assessment of pain as it reflects accurately in the VAS score.

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