

Comparison of Pre and Post Tonsillectomy Clinical Assessment of Weight with Increase in Weight in Children

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ABSTRACT

Background: Tonsils and adenoid are part of local immunity near the entrance of respiratory and digestive tracts. However they may become infected and can be a source of chronic or recurrent infections and can lead to OSAS if enlarged. In case of significant morbidity surgical resection is indicated.

Aim: To study the relationship between tonsillectomy and increase in weight in children.

Setting: ENT Unit II of Fatima Jinnah Medical University and Sir Ganga Ram Hospital Lahore

Duration: 1st February 2021 to 31st January 2022.

Study design: Quasi experimental study

Method: All patients of 5 to 9 years of age with history of recurrent tonsillitis and obstructive sleep apnea syndrome were included. Total of 88 patients selected with non probability convenient sampling. Clinical assessment was done for recurrent and chronic tonsillitis and tonsil hypertrophy causing OSAS. Pre operative weight measured and compared with post operative weight at 3 months follow up.

Results: Out of 88 participants 74(84.1%) have recurrent tonsillitis and 75(85.2%) have OSAS. Mean pre operative weight was 16.6591 kg and mean post operative weight was 19.8182 kg. Paired sample t test was applied and p value was calculated which was statistically significant.

Conclusion: There is a significant increase in weight after tonsillectomy in children at 3 months follow up that is beneficial in terms of quality of life, school performances, behavior and mental well being.

Keywords: Recurrent tonsillitis, Obstructive sleep apnea syndrome, Tonsillectomy, Nocturnal enuresis, Chronic tonsillitis.

INTRODUCTION

Tonsils and adenoids are lymphoid organs positioned near the entrance of the respiratory and digestive tracts. They are necessary for the maintenance of local immunity. As a result this region serves as the immune system's initial contact point with a range of antigenic chemicals found in microbes, foods and the inspired air. [1] Chronic or recurrent tonsillitis or tonsil hypertrophy, however leads to significant morbidity. According to study, children with Obstructive sleep apnea syndrome (OSAS) may contribute to academic failure and lower quality of life than controls. OSAS may contribute to underachievement in children and should be assessed during developmental assessments. It is unknown whether growth failure occurs as a result of hormonal changes induced by OSAS or as a result of the substantial energy expenditure required to overcome the airway restriction. Patients and caregivers should be informed about the benefits of tonsillectomy in children with less severe disease².

Fowler defined a "modern" tonsillectomy in 1930 as the removal of the tonsil, the entire tonsil and nothing but the tonsil, a surgery that involved meticulous anatomical dissection on the operative place between the pharyngeal muscle and the tonsillar capsule³.

The emphasis on entire tonsillectomy during the pre-antibiotic era, when tonsillectomies were typically performed for persistent infections, was based on the finding that tonsillar remains could re-infect and cause prolonged disease following subtotal resection. [4] However, this procedure remained a source of frustration for surgeons due to two complications: longer duration pain and delayed hemorrhage⁵. These complications are induced by infection and inflammation of the tonsil bed which is exposed to pharyngeal secretions and are a result of the

fundamental architecture of the standard tonsillectomy⁶. The mucus layer that coats the mucosal surfaces of the upper respiratory system serves as the first line of defense against antigens. This defense is based on secretory immunoglobulins generated from mucus⁷.

The objective of the study was to study the relationship between tonsillectomy and increase in weight in children.

MATERIALS AND METHOD

This study was conducted in ENT Unit II of Fatima Jinnah Medical University and Sir Ganga Ram Hospital Lahore from 1st February 2021 to 31st January 2022. This study is a quasi experimental study with 88 patients selected with non probability convenient sampling. Permission was obtained from Institutional Ethical Review Committee.

All patients of 5 to 9 years of age with history of recurrent tonsillitis and OSAS were included. Children with acute adenotonsillitis, malnutrition, congenital anomalies and chronic illnesses such and those who were unfit for general anesthesia were excluded from our study. Data was collected by using a pre-designed pro-forma. Diagnosis of recurrent tonsillitis and obstructive sleep apnea syndrome was made by clinical history and physical examination. Pre-operative weight will be measured and compared with post-operative weight at 3 months follow up visit. Data was entered in SPSS-26. Quantitative variable i.e. age and weight gain were presented as mean±SD. Qualitative variables were presented as frequency and percentages. Proportionate weight gain in relation to tonsillectomy was noted. Comparison of pre-operative and post-operative results were presented by applying paired sample t-test. P value ≤ 0.05 will be taken as significant.

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RESULTS

In the current study our aim was to study the relationship between tonsillectomy and increase in weight in children, we studied descriptive statistics on patient's demographics which includes: 1) Age; 2) Gender; 3) Duration of recurrent tonsillitis symptoms, number of acute tonsillitis episodes annually, episodes of sleep apnea; 4) Recurrent tonsillitis; 5) Obstructive sleep apnea syndrome (OSAS); 6) Bad breath; 7) Snoring; 8) Daytime sleepiness; 9) Poor school performance; 10) Dusky appearance of anterior pillars; 11) Enlarge jugulodiagastric lymph nodes; 12) Enlarge tonsils obstructing the airways; 13) Prominent crypts; 14) Statistical analysis of weight pre and 3 months post tonsillectomy. All of these parameters and their results after statistical analysis are shown below.

Table 1: Symptoms and signs related to recurrent tonsillitis and OSAS

Symptoms/Signs	Frequency	%age
Bad breath	23	26.1
Snoring	29	33
Daytime sleepiness	19	21.6
Poor school performance	35	39.8
Dusky appearance of anterior pillars	58	65.9
Enlarged jugulodiagastric lymph nodes	55	62.5
Enlarged tonsils obstructing airway	56	63.6
Prominent crypts over tonsils	54	61.4

Total of 88 patients were included in this study with age range from 5 to 9 years with a mean age of 6 years and 8 months (SD=1.44).

Table 4: Paired samples test (B)

Pair 1	Paired Differences				t	df	Sig (2-tailed)	
	Mean	SD	Std. Error	95% Confidence Interval of the Difference				
				Lower				Upper
Weight: Pre-operative and post-operative	3.15909	.90828	.09682	3.35154	2.96664	32.627	.000	

DISCUSSION

Every episode of tonsillitis should be clinically documented for symptoms, findings, rapid antigen detection testing and culture results⁹. While tonsillectomy can decrease the recurrence of sore throat and health care utilization, this benefit is only transient, and benefits are significantly diminishes in children with a light disease burden⁹. Regardless of the type of operation, the results in terms of quality of life increase over time. Additionally, fewer children suffered more episodes of mild to severe sore throat following surgery compared to controls. As a result of these findings, tonsillectomy in children who do not match the "Paradise criterion" is neither financially viable nor therapeutically effective (7 episodes in the past year, 5 episodes per year in the past 2 years, or 3 episodes per year in the past 3 years)¹⁰. Urgent medical therapy should be given in significant cases of pharyngitis caused by group A beta-hemolytic streptococcus (GABHS)¹¹. Clinicians should assess children with disturbed sleep and tonsillar hypertrophy resulting in decreased growth, poor school performance, asthma, and behavioral abnormalities; that may improve after tonsillectomy¹². OSAS is characterized as a condition in which the upper airway is repeatedly occluded, impairing normal oxygenation and sleep patterns.

A history, physical examination, audio/video tapping, pulse oximetry, and polysomnography can all be used to identify OSAS in children. The history and physical examination are the two primary diagnostic methods most usually used for OSAS¹³. The most common cause of OSAS in children is tonsil and adenoid hypertrophy. To evaluate tonsil size, a generally used tonsil grading system is utilized with tonsillar hypertrophy. The severity of OSAS is most likely due to a combination of tonsil and adenoid hypertrophy, craniofacial abnormality, and neuromuscular tone. Tonsils as small as 11 mm in diameter, may impede the airway especially in those who have hypotonic muscles and/or craniofacial anomalies¹⁴. OSAS has been shown to increase the

likelihood of certain children externalizing (aggression, hyperactivity) and internalizing (depression) behaviors, resulting in attention-deficit/hyperactivity disorder symptoms. Difficulties with memory and attention, which are frequently related with OSAS, may contribute to academic failure¹⁵. Primary enuresis refers to a child who has never had control over his or her overnight urination, whereas secondary enuresis refers to a child who has regressed in night time control. Secondary enuresis is sometimes overlooked during routine clinical assessment due to the shame it causes to the kid and family. Practitioners should be aware of the link between OSAS and secondary enuresis. Following tonsillectomy, enuresis has been found to improve in majority of children. According to a systematic evaluation of 14 researchers, OSAS is related with nocturnal enuresis and tonsillectomy greatly improves. Numerous studies have demonstrated that these modifiable factors improve or disappear completely in children who have tonsillectomy for OSAS¹⁶. Both objective and subjective assessments of behavioral and neurocognitive impairments following tonsillectomy for OSAS have revealed considerable improvement. It has been demonstrated that this alteration in behavior persists for at least two years following tonsillectomy. Additionally, there is a significant increase in children's quality of life following surgery, which can persist for up to 2 years¹⁷. Another systematic review shows changes in height and weight following tonsillectomy for OSAS concluded that tonsillectomy significantly increased height, weight, and growth biomarkers, implying that OSAS secondary to tonsil and adenoid hypertrophy should be considered when screening, treating and referring children who exhibit growth failure. Tonsillectomy has also been observed to relieve asthmatic symptoms. All indices of asthma severity were considerably reduced following tonsillectomy, including medicine use, emergency department visits for asthma-related symptoms, and exacerbations in asthma¹⁸. While fresh evidence strongly supports tonsillectomy for OSAS, additional randomized

Table 2: Pre and post operative weight

	N	Min.	Max.	Mean	SD
Preoperative weight (kg)	88	13.00	22.00	16.6591	2.43955
Postoperative weight (kg)	88	16.00	27.00	19.8182	2.83064

Table 3 and 4 shows results of applying Shapirowilk Kolmogorov-smirnov Test for the normality check of paired sample t-test. This evaluates the difference in weight pre-operatively and post operatively after 3 months. The p-value of < 0.05 was considered statistically significant.

Table 3: Paired samples correlations (A)

Pair 1	N	Correlation	Sig
Weight: Pre-operative and post-operative	88	0.951	.000

controlled studies across a range of age groups are required to determine which groups of children may benefit from surgery and medical treatments¹⁹.

CONCLUSION

Results of this study demonstrates that there is significant increase in weight after tonsillectomy in children at 3 months follow up that is beneficial in terms of quality of life, school performances, daily behavior and mental well being.

Conflict of interest: Nil

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