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RESEARCH ARTICLE

STUDY OF EFFECT OF ADENOTONSILLECTOMY IN CHILDREN WITH SLEEP DISORDERD BREATHING USING PEDIATRIC SLEEP QUESTIONNAIRE.

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Abstract

Background: This prospective study was conducted to clinically evaluate Sleep Disorderd Breathing children after Adenotonsillectomy Using Pediatric Sleep Questionnaire. SDB can lead to substantial morbidities, affecting the central nervous system (CNS), the cardiovascular and metabolic systems, and somatic growth, ultimately leading to reduced quality of life.

Methods: This prospective study was conducted in 47 patients in the Department of Otorhinolaryngology Head and Neck Surgery, Government Medical College and associated SMHS Hospital Srinagar. In this study, we included the patients with SDB in pediatric age group, who visited in our OPD. Pediatric Sleep questionnaire was used pre-operatively, at 2 and 6 months after surgery.

Results: Our study group comprised of total 47 patients with majority of patients with in age group of 5-7 years, males were 29 (61.70%) and females were 18 (38.30%). Snoring, mouth breathing and frequent awakening were the most common presenting symptoms, 89.36%, 85.11% and 70.21% respectively. Juglodigastric Lymphadenopathy, High Arched Palate were the most common signs, 85.11% and 78.12% respectively. Paediatric sleep questionnaire (PSQ) was used pre-operatively, at 2 months, at 6 months. Pre-operative score showed that majority of patients 41 (87.23%) had score between 8-15 i.e, moderate SDB and 6 (12.77%) patients had score between 16-22 i.e, severe SDB. Mean PSQ value pre-operatively, at 2 months and at 6 months were 12.27, 3.38, 2.13 respectively, showing improvement in the degree SDB after surgical intervention.

Conclusion: Based on the observations made in the study we concluded that there was a significant improvement in Pediatric sleep questionnaire (PSQ scale was used for diagnostic purpose pre-operatively, at 2 months and at 6 months, showed the mean score of 12.28, 3.68 and 2.36 respectively), which shows there is significant improvement in post operative scores as compared to preoperative score and hence post operative symptoms after surgical intervention.

Introduction:-

Sleep-disordered breathing (SDB) is a common entity in children and includes a continuum of sleep-related breathing disturbances, SDB encompasses the spectrum of sleep disorders ranging in severity from primary snoring to obstructive sleep apnea(OSA), OSA on the severe end of the spectrum, and is generally diagnosed clinically based on signs and symptoms.¹The term sleep disordered breathing (SDB) refers to group of respiratory disorders that occur or are exacerbated during sleep. Sleep Disordered Breathing (SDB) is characterized by: abnormal respiratory patterns (e.g. the presence of apneas or hypopneas) or insufficient ventilation during sleep. Sleep disorder breathing is an umbrella term for several chronic conditions in which partial or complete cessation of breathing occur many times throughout the night, resulting in daytime sleepiness or fatigue that interferes person's ability to function and reduces quality of life.²

Classification of SDB³

1. Primary snoring
2. Upper airway resistance syndrome (URAS)
3. Obstrutive sleep apnoea syndrome (OSAS)

OSA is the most common type of SDB. The prevalence of OSAS in children is estimated to be 2%. Children with sleep disordered breathing (SDB) can manifest a continuum from simple snoring and upper airway resistance syndrome to obstructive sleep apnea (OSA)^{4,5}. SDB has also been associated with decreased cognitive skills, decreased quality of life (QOL), behavior disturbances and neurocognitive changes in children.⁶ Medical conditions and anatomical abnormalities can predispose to SDB and OSA, including adenotonsillar hypertrophy, obesity, trisomy 21, cerebral palsy, and craniofacial anomalies.⁷⁻¹². The aim of our study was to evaluate the paediatric patients clinically, and to assess the impact of surgical intervention on SDB symptoms using pediatric sleep questionnaire.

OBJECTIVE:-

To study the effect of adenotonsillectomy in children with sleep disorderd breathing using pediatric sleep questionnaire.

Material and Method Of Study:-

This prospective study was conducted in the Department of Otorhinolaryngology Head and Neck Surgery, Government Medical College and associated SMHS Hospital Srinagar from July 2015 to July 2017. In this study we included the patients with SDB in pediatric age group, who visited in our OPD.

Diagnostic methods that have been scientifically evaluated include history and physical examination, pulse oximetry, abbreviated polysomnography, and full polysomnography

1. History and physical evaluation¹³⁻¹⁵
2. Sleep history screening for snoring should be a part of routine health care visit. A more detailed history regarding labored breathing during sleep, observed apnea restless sleep, diaphoresis, anuresis, excessive daytime sleepiness and behaviour and learning problem (Including Attention deficit and hyperactivity disorder) should be obtained. On physical examination finding during wakefulness are often normal. There may be nonspecific finding related to Adenotonsillar hypertrophy such as mouth breathing nasal obstruction during wakefulness, adenoid facies and hyponasal speech. Evidence of complication of OSAS may be present such as systemic hypertension and poor growth.
3. Polysomnography in patients who cooperates¹⁶

All the patients with adenotonsillar hyperplasia who fail to respond to conservative management were subjected to adeno-tonsillectomy surgery.

Evaluation of children with symptoms of OSAS is also based on the sleep **pediatric sleep questionnaires (PSQ) developed by University of Michigan accepted on 4th October 1999**. They validate the questionnaire scale for OSAS and relate symptoms including three prominent symptom complexes: Snoring, Excessive daytime sleepiness and inattentive or hyperactive behavior. Both sensitivity and specificity were high when 8 or more positive answers to the 22 questions were considered abnormal. **Pediatric Sleep Questionnaires (PSQ) Scale Was Used For Diagnostic Purpose Pre-Operatively, At 2 Months And At 6 Months.**

Results:-

This prospective hospital based study was conducted in the Department of Otorhinolaryngology, Head and Neck Surgery, Government Medical College and Associated SMHS Hospital Srinagar. A total of 47 patients were included with following details.

Table 1:- Age wise Distribution of patients

Age Group(Years)	No. Of Patients	%age
2—4	12	25.53%
5—7	23	48.94%
8-10	8	17.02%
11-13	3	6.38%
14—16	1	2.23%

Table 1 showing that our study group comprised of total 47 patients with majority of patients with in age group of 5-7 years. With youngest patient was 3 years and eldest was 15years old.

Table 2:- Sex Wise distribution of Patients

SEX	No. Of Patients	%age
Male	29	61.70%
Female	18	38.30%
Total	47	100%

Table 2 showing that majority of patients in our study males were 29 (61.70%) and females were 18 (38.30%).

Table 3:- Distribution of presenting Symptoms

Symptoms	No. Of Patients	%age
Snoring	42	89.36%
Mouth Breathing	40	85.11%
Frequent Awakening	33	70.21%
Poor school Performance	19	40.43%
Irritable Behavior	26	55.32%
Nocturnal Enuresis	19	40.43%
Chocking Episodes	24	51.06%
Day time Sleepiness	13	27.66%
Difficulty In getting up in the morning	26	55.32%
Growth Retardation	5	10.64%
Recurrent Upper airway Infections	31	65.96%
Runny Nose	32	68.09%
Difficulty in Feeding	18	38.30%
Hyperactive Behavior	22	46.81%
Otalgia	26	55.31%
Ear fullness	11	23.40%

Table 3: showing that in our study group comprised of 47 patients Snoring, mouth breathing and frequent awakening were the most common presenting symptoms with 89.36% presented with Snoring, 85.11% presented with mouth breathing and 70.21% presented with frequent awakening. Other symptoms shown in the table with %age.

Table 4:- Distribution of Clinical Finding on Examination

Signs of Patients	No. of Patients	%age
Pinched Nose	18	38.30%
High Arched Palate	37	78.72%
Over Crowded Teeth	17	36.17%
Retracted Tympanic membrane	16	34.04%
Glue ear	2	4.26%
Hypertrophic Inferior Turbinate	23	48.94%
Deviated Nasal Septum	7	14.89%
Jugulodigastric Lymph Adenopathy	40	85.11%

Pale Mucosa	22	46.80%
Blue colour Turbinate	21	44.68%

Table 4 showing that in our study group comprised of 47 patients Juglodigastric Lymph Adenopathy, High Arched Palate was the most common finding on examination with 85.11% Juglodigastric Lymph Adenopathy and 78.12% High Arched Palate. The others finding on examination presented in the table with %age.

Table 5:- Pediatric Sleep Questionnaire (PSQ) Scale Score is used to investigate the presence of childhood SDB and prominent symptom complexes.

Preoperative Score

PSQ Scale Score	No. Of Patients N=47	%age
<8	nil	Nil
8—15	41	87.23%
16--22	6	12.77%

PSQ = Pediatric Sleep Questionnaire Score

Table 5 showing that in our study group, the PSQ scale used pre-operatively showed the majority of the patients 41 (87.23%) having score in 8-15 range indicating that SDB is present.

Table 6:- Pediatric Sleep Questionnaire Scale (PSQ) used in postoperative period at 2months and at 6 months

Post op PSQ scale	2 months (n=47)	Percentage	6 months(n=47)	Percentage
< 8	47	100%	47	100%
8 – 15	0	0%	0	0%
16 – 22	0	0%	0	0%

Table 6 showing that postoperative PSQ score improved significantly suggesting improvement in symptoms of SDB postoperatively.

Table 7:- Comparison of Pediatric Sleep Questionnaire Score (PSQ) Score preoperative, at 2 months and at 6 months

Descriptive Statistics				95% confidence interval	
	mean	Std. Deviation	N	Lower Bound	Upper Bound
PSQ preoperative	12.28	2.092	47	11.662	12.891
PSQ 2 months	3.68	1.520	47	3.235	4.127
PSQ 6 months	2.36	1.241	47	1.997	2.726
P value for PSQ pre op vs PSQ at 2 months <0.001 (repeated measures ANOVA,Bonferroni post-hoc)					
P value for PSQ at 2 months vs PSQ at 6 months <0.001 (repeated measures ANOVA,Bonferroni post-hoc)					

Table 7 showing that in our study group of 47 patient the Pediatric Sleep Questionnaire preoperative score was (mean 12.28) high but postoperative score reduced to mean 3.68 at 2 months and mean 2.36 at 6 months. This signify that there is significant improvements in SDB symptoms after surgery (adenotonsillectomy)

Discussion:-

Sleep-disordered breathing (SDB) represents a spectrum of sleep-related diseases resulting in nocturnal breathing difficulty, ranging from intermittent and habitual snoring (HS) to obstructive sleep apnea syndrome (OSAS). SDB is extremely common; estimates suggest that HS and OSAS occur in 10% and 2% to 4% of children, respectively.¹⁷ Untreated pediatric SDB is associated with numerous comorbidities that include lowered IQ, decreased executive function, behavioural problems, secondary nocturnal enuresis, and cardiopulmonary dysfunction.¹⁸

In the present study, we had 47 patients with majority of patients were males 29 (61.70%) and females were 18(38.30%), with majority of patients were in the age group of 5-7 yrs (48.94%)Table 1-2 .**JOSE MARIO DE LIMA JUNIOR et al**¹⁹also found in their study that 56.2 % were males and 43.8% were females with mean age of 6yrs and 6 months.**RON B.et al**²⁰ also found in their study that 51% were males and 49% were females with mean age of 6.3 yrs i.e, the male preponderance.**VALERIE A et al**²¹ found in their study that 53% were females and 47% were males with mean age of 6 yrs.It is a consensus among various authors that adenoid or adenotonsillary hyperplasia is the main cause of SDB among children²²⁻²⁵adenoidectomy (or adenotonsillectomy) have been, therefore, procedures of choice for the treatment of most cases of SDB in the pediatric population.

In the present study of 47 patients Snoring, mouth breathing and frequent awakening were the most common presenting symptoms with 89.36% presented with Snoring, 85.11% presented with mouth breathing and 70.21% presented with frequent awakening. Juglodigastric Lymphadenopathy, High Arched Palate were the most common signs with 85.11% Juglodigastric Lymphadenopathy and 78.12% High Arched Palate (table 3,4). **NIRAN.A et al**²⁶ in their study of 100 children found that majority of patients had symptoms of snoring, mouth breathing, choking, gasping and majority had signs of adenoid facies, high arched plate and increased tonsillar size. **VALERIE A et al**²¹ in their study of 60 patients found that 51 (85%) patients presented with snoring, 51 (85%) patients presented with mouth breathing, grade 3 and grade 4 tonsil size was seen in 50% and 36% patients respectively. In the present study we also used paediatric sleep questionnaire (PSQ) pre-operatively, at 2 months, at 6 months. Pre-operative score showed that majority of patients **41 (87.23%)** had score between **8-15** i.e, moderate SDB and **6 (12.77%)** patients had score between **16-22** i.e, severe SDB. Mean PSQ value pre-operatively, at 2 months and at 6 months were **12.27**, **3.38**, **2.13** respectively, showing improvement in the degree SDB (table 5,6,7)

Conclusion:-

Based on the observations made in the study, we concluded that there was a significant improvement in Pediatric sleep questionnaires (PSQ scale was used for diagnostic purpose pre-operatively, at two months and at six months, showed the mean score of 12.28, 3.68 and 2.36 respectively), which shows there is significant improvement in post operative score as compared to preoperative score and hence post operative symptoms after surgical intervention.

Bibliography:-

1. Guilleminault C, Pelayo R, Leger D, Clerk A, Bocian RC. Recognition of sleep-disordered breathing in children. *Pediatrics* 1996;98:871–882.
2. American Thoracic Society. Standards and indications for cardiopulmonary sleep studies in children. *Am J Respir Crit Care Med* 1996; 153: 866-878.
3. Coleman JA. Pathophysiology of snoring and obstructive sleep apnea: airway dynamics. In: Fairbanks DNK, Mickelson SA, Woodson BT, eds. *Snoring and Obstructive Sleep Apnea*. 3rd ed. Philadelphia: Williams & Wilkins Co., 2003:19.
4. Ali NJ, Pitson DJ. Snoring. Sleep disturbance, and behavior in 4-5 year olds. *Arch Dis Child* 1993; 68: 360-366.
5. Redline S, Tishler PV, Schluchter M, Aylor J, Clark K, Graham G. Risk factors for sleep disordered breathing in children: associations with obesity, race, and respiratory problems. *Am J Respir Crit Care Med* 1999; 159: 1527-1532.
6. Mitchell RB, Kelly J. Behavior, neurocognition and quality-of-life in children with sleep-disordered breathing. *Int J Pediatr Otorhinolaryngol* 2006;70:395–406.
7. Mitchell RB, Call E, Kelly J. Diagnosis and therapy for airway obstruction in children with Down syndrome. *Arch Otolaryngol Head Neck Surg* 2003;129:642–645.
8. Mitchell RB, Kelly J. Adenotonsillectomy for obstructive sleep apnea in obese children. *Otolaryngol Head Neck Surg* 2004;131:104–108.
9. Kotagal S, Gibbons VP, Stith JA. Sleep abnormalities in patients with severe cerebral palsy. *Dev Med Child Neurol* 1994;36:304–311.
10. Lam DJ, Jensen CC, Mueller BA, Starr JR, Cunningham ML, Weave EM. Pediatric sleep apnea and craniofacial anomalies: a population-based case-control study. *Laryngoscope* 2010;120:2098–2105.
11. Costa DJ, Mitchell R. Adenotonsillectomy for obstructive sleep apnea in obese children: a meta-analysis. *Otolaryngol Head Neck Surg* 2009;140:455–460.
12. Myatt HM, Beckenham EJ. The use of diagnostic sleep nasendoscopy in the management of children with complex upper airway obstruction. *Clin Otolaryngol Allied Sci* 2000;25:200–208.
13. Guilleminault C, Korobkin R, Winkle R. A review of 50 children with obstructive sleep apnea syndrome. *Lung* 1981; 159: 275–287.
14. Brouillette R, Hanson D, David R, Klemka L, Szatkowski A, Fernbach S, Hunt C. A diagnostic approach to suspected obstructive sleep apnea in children. *J Pediatr* 1984; 105: 10–14.
15. Stradling JR, Thomas G, Warley AR, Williams P, Freeland A. Effect of adenotonsillectomy on nocturnal hypoxaemia, sleep disturbance, and symptoms in snoring children. *Lancet* 1990; 335: 249–253.
16. Rosen CL. Clinical features of obstructive sleep apnea hypoventilation syndrome in otherwise healthy children. *Pediatr Pulmonol* 1999; 27: 403–409.

17. Goldbart AD, Tal A. Inflammation and sleep disordered breathing in children:a state-of-the-art review. *Pediatr Pulmonol* 2008;43:1151–1160.
18. Cardiorespiratory sleep studies in children. Establishment of normative data and polysomnographic predictors of morbidity. American Thoracic Society. *Am J Respir Crit Care Med* 1999;160:1381.
19. Jose Mario de Lima Junior, Vivane Carvalho da Silva, Marcos Rabelo de Freitas Long term results in the life quality of children with obstructive sleep disorders *Rev Bras Otorrinolaringol* 2008; 74(5): 718-24.
20. Ron B. Mitchell James Kelly. Outcomes and Quality of life following Adenotonsillectomy for sleep-disordered breathing in children *ORL* 2007; 69: 345-348.
21. Valerie A. Flanary, MD, Long-Term Effect of Adenotonsillectomy on Quality of Life in Pediatric Patients, *Laryngoscope* 113:1639-1644,2003.
22. Leach J, Olson J, Hermann J, Manning S. Polysomnographic and clinical findings in children with obstructive sleep apnea. *Arch Otolaryngol Head Neck Surg* 1992;118(7):741-4.
23. Reilly JS. Apnéia obstrutiva do sono e ronco em crianças: noções gerais. Em: Sih T, Chinski A, Eavey R, editores. III Manual de Otorrinolaringologia Pediátrica da IAPO. 2003;p. 59-66.
24. Messner AH, Pelayo R. Pediatric sleep-related breathing disorders. *Am J Otolaryngol* 2000;21(2):98-107.
25. Weckx LLM, Weckx LY. Respirador bucal: causas e conseqüências. *Rev Bras Med* 1995;52(8):863-74.
26. Nira A. Goldstein, MD, MPH; Dimitre G. Stefanov, PhD; Katharina D. Graw-Panzer, MD;Samir A. Fahmy, MD; Sherry Fishkin, MD; Alison Jackson, BA;Jennifer S. Sarhis, BS; Jeremy Weedon, PhD , Validation of a Clinical Assessment Score for Pediatric Sleep-Disordered Breathing. . *Laryngoscope*, 122:2096–2104, 2012.