

Original Research Article

Study of impact of surgical intervention (adenotonsillectomy) and conservative management on quality of life in patients with SDB

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ABSTRACT

Background: SDB is an important cause of morbidity in children. SDB has been associated with decreased quality of life (QOL). In this study, we tried to determine The impact of surgical intervention (adenotonsillectomy) and conservative management on quality of life in patients with SDB.

Methods: A total of 112 pediatric patients were included with SDB, who visited our OPD. Diagnostic methods include history and physical examination, audiotaping or videotaping, pulse oximetry. OSA 18 questionnaire was used to assess the quality of life with conservative treatment (pre and post-treatment) and after surgical intervention-before and after adenoidectomy or adenotonsillectomy.

Results: We had 112 patients with majority being males 69 (61.60%) and females 43 (38.30%), majority of patients were in the age group of 5-7 yrs (49.10%). In 47 patients (who underwent adenotonsillectomy/tonsillectomy), OSA-18 questionnaire was used pre-operatively, at 2 and 6 months. OSA-18 when used pre-operatively showed majority of patients 33 (70.21%) having score >80, and 14 (29.79%) patients having score between 60-80. No patient was below 60 score. Mean OSA-18 score pre-operatively was 84.15. OSA-18 score at 2 months and at 6 months were 30.06 and 26.40 respectively, which showed a lot of improvement in post-operative score and hence the post-operative quality of life. In 65 patients (conservative treatment) OSA-18 was used pre-conservative, at 2 and 6 months of treatment. OSA-18 when used before conservative treatment showed majority of patients 44 (67.6 9%) having score 60-80, and 21 (32.30%) patients having score between >80. No patient was below 60 score. OSA-18 score at 2 months showed improvement in 69.23% patients (<40), OSA-18 at 6 months showed recurrence in 12.33% patients.

Conclusions: SDB substantially impact QOL in pediatric patients. QOL significantly improves following adenotonsillectomy. There is subset of patients 12.33% with SDB in whom there was recurrence of symptoms after conservative treatment. Thus showing that conservative management is inferior to surgical management in the treatment of SDB. SDB improved after an observation period. Thus, observation with close follow-up is another treatment option.

Keywords: SDB, OSA-18, Quality of life

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). SDB has also been associated with decreased cognitive skills, decreased quality of life (QOL), behavior disturbances and neurocognitive changes in children.¹ Pediatric SDB is characterized by recurring episodes of complete and or partial obstruction of the upper airway during sleep,

resulting in intermittent hypoxemia and hypercapnia, frequent arousals, and sleep fragmentation.^{2,3} SDB is an important cause of morbidity in children, and if untreated may lead to growth failure, neurocognitive and behavioural abnormalities, and cardiovascular effects including cor pulmonale, right and left ventricular dysfunction, and systemic hypertension. Quality of life is increasingly recognized as an important health outcome measure in clinical medicine. A recent meta-analysis demonstrated poor QOL scores in children with SDB and significant improvements in QOL following adenotonsillectomy, irrespective of AHI.⁴ The authors concluded that the impact of SDB affects children's behavior, daytime functioning, and family life.⁴ Thus, many children with mild SDB potentially warrant treatment. In children, adenotonsillar hyperplasia is the most common cause of upper airway obstruction. Thus, the primary treatment for pediatric OSA is adenotonsillectomy.⁵ Numerous studies have demonstrated improvements in neuropsychological outcomes such as behavior, school performance, and attention following surgery for pediatric SDB.⁶ There is also a growing body of literature highlighting improvements in QOL following adenotonsillectomy.⁴ Management of children with mild SDB, however, remains controversial, since the natural history of mild SDB is not well understood.⁷ Thus, it is challenging to counsel caregivers about how best to treat mild SDB. Our primary objective was to determine the impact of adenotonsillectomy vs. observation on QOL in children with mild SDB.

Objective

The objective of the study was to determine the impact of surgical intervention and conservative management on quality of life in patients with SDB.

METHODS

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 October 2017. The patients with SDB in pediatric age group, who visited our OPD, were included in the study. Diagnostic methods that have been scientifically evaluated include history and physical examination, audiotaping or videotaping, pulse oximetry, abbreviated polysomnography, and full polysomnography

- History and physical evaluation.⁸⁻¹⁰
- 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.

The pediatric sleep questionnaire scale for OSAS and related symptoms including three prominent symptom complexes: Snoring, excessive daytime sleepiness and inattentive or hyperactive behavior.^{11,12} Both sensitivity and specificity were high when 8 or more positive answers to the 22 questions were considered abnormal.

- Pulse oximetry¹³

The finding of intermittent oxygen desaturation in children during sleep is highly suggestive of OSAS.

- Polysomnography in patients who cooperates.¹⁴
- All the patients with adenotonsillar hyperplasia who fail to respond to conservative management was subjected to adeno-tonsillectomy surgery.

The finding of intermittent oxygen desaturation in children during sleep is highly suggestive of OSAS.

To assess the quality of life with SDB in patients with conservative treatment (pre and post-treatment) and those patients with before and after adenoidectomy or adenotonsillectomy OSA 18 questionnaire was used, The OSA 18 has 18 items in 5 domains including sleep disturbances, physical symptoms, emotional symptoms, daytime functions and caregiver concerns. The question was administered to the patient 2 weeks before and at 2 months and 6 months after surgery.¹⁵ There are total 18 questions and each question score between 1-7 and total score is 126. The impact on the quality of life is classified as mild <60, moderate 60-80 and severe >80. Dramatic improvement in the total score after T&A has been shown in number of studies within 6 months after surgery.

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 112 patients were included with following details.

Table 1 showing that our study group comprised of total 112 patients with majority of patients with in age group of 5-7 years.

Table 2 showing that majority of patients in our study males were 69 (61.60%) and females were 43 (38.40%).

Table 3 showing that our study group comprised of total 112 patients with 59.82% were from urban area and 40.18% were from rural area.

Table 1: Age wise distribution of patients.

Age group (years)	No. of patients	%
2-4	32	28.57
5-7	55	49.10
8-10	18	16.07
11-13	5	4.48
14-16	2	1.78
Total	112	100

Table 2: Sex wise distribution of patients.

Sex	No. of patients	%
Male	69	61.60
Female	43	38.40
Total	112	100

Table 3: Demographic distribution of patients.

Demography	No. of patients	%
Urban	67	59.82
Rural	45	40.18
Total	112	100

Table 4: Distribution of presenting symptoms.

Symptoms	No. of patients	%
Snoring	96	85.71
Mouth breathing	91	81.25
Frequent awakening	74	66.07
Poor school performance	48	42.85
Irritable behavior	52	46.42
Nocturnal enuresis	43	38.39
Chocking episodes	41	36.60
Day time sleepiness	23	20.53
Difficulty in getting up in the morning	48	42.85
Growth retardation	6	5.35
Recurrent upper airway infections	59	52.67
Runny nose	61	54.46
Difficulty in feeding	35	31.25
Hyperactive behavior	46	41.07
Otalgia	48	42.85
Ear fullness	21	18.75

Table 4 showing that in our study group comprised of 112 patients. Snoring, mouth breathing and frequent awakening were the most common presenting symptoms with 85.71% presented with snoring, 81.25% presented with mouth breathing and 66.07% presented with frequent awakening. Other symptoms shown in the table with percentage.

Table 5 shows that juglodigastric lymph adenopathy, High Arched Palate was the most common finding on

examination with 60.71% juglodigastric lymph adenopathy and 59.82% high arched palate. The others finding on examination presented in the table with percentage.

Table 5: Distribution of clinical findings on examination.

Signs	No. of patients	%
Pinched nose	38	33.92
High arched palate	67	59.82
Overcrowded teeth	37	33.03
Retracted tympanic membrane	32	28.57
Glue ear	3	2.67
Hypertrophic inferior turbinate	43	38.39
Deviated nasal septum	17	15.17
Juglodigastric lymph adenopathy	68	60.71
Pale mucosa	42	37.50
Blue colour turbinate	31	27.67

Table 6: Classification of patients on the basis of tonsil grades (according to Brodsky Grading scales).

Grade	No. of patients (N=112)	%
0	nil	nil
1	46	41.07
2	33	29.47
3	18	16.07
4	15	13.39

Table 7: Treatment.

Treatment options	No of patients	%
Surgical treatment	47	41.96
Conservative treatment	65	58.04

Table 8: Preoperative score: using OSA-18.

OSA 18 score	No. of patients (N=47)	%
<60	0	0
60-80	14	29.79
>80	33	70.21

Table 6 shows majority of the patients had grade I and grade II Tonsils Hypertrophy.

Table 7 shows, surgical intervention was done in 47 patients and conservative treatment for 65 patients.

Table 8 showing that in our study group of 47 patients the OSA 18 scale used pre-operative shows majority of patients 33 (70.21%) having score >80 score showing that there was a major impact on quality of life.

Table 9: OSA 18 scale used in postoperative period at 2 months and at 6 months.

OSA 18 scale score	2 months (n=45)	%	6 months (n=45)	%
<40	47	100	47	100
40-60	0	0	0	0
>60	0	0	0	0

Table 10: Pre conservative treatment OSA-18 score.

OSA 18 score	No. of patients (N=65)	%
<60	0	0
60-80	44	67.69
>80	21	32.30

Table 11: OSA 18 scale used in post conservative treatment at 2 months and at 6 months.

OSA 18 scale score	2 months (n=65)	%	6 months (n=65)	%
<40	45	69.23	40	61.53
40-60	12	18.46	15	23.07
>60	8	12.3	10	15.38

Table 12: Recurrence after treatment.

Treatment options	No of patients	%
Surgical treatment	nil	0
Conservative treatment	8	12.30

Table 13: Surgical.

Type of surgery	No. of patients	%
Adenotonsillectomy	41	87.23
Tonsillectomy	4	8.51
Adenoidectomy	0	0.0
Adenotonsillectomy and VTI	1	2.13
Tonsillectomy and VTI	1	2.13
Total	47	100%

Table 9 indicates that there is significant improvement in OSA 18 Score in postoperative period and hence improvement in quality of life.

Table 10 shows that majority of patients 44 (67.69%) have score between 60-80.

Table 11 indicates that there was improvement in OSA 18 Score at 2 months and there was deterioration of quality of life at 6 months using OSA -18 scale.

Table 12 shows there was no recurrence after surgical treatment and recurrence of 8 patients after conservative treatment.

Table 13 shows various types of surgeries done. Adenotonsillectomy was done in 41 (87.23%) patients.

DISCUSSION

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.¹⁶ Untreated pediatric SDB is associated with numerous comorbidities that include lowered IQ, decreased executive function, behavioural problems, secondary nocturnal enuresis, and cardiopulmonary dysfunction.¹⁷

In the present study, we had 112 patients with majority of patients were males 69 (61.60%) and females were 43(38.30%), with majority of patients were in the age group of 5-7 yrs (49.10%), with 67(59.82%) living in urban areas. Junior et al also found in their study that 56.2% were males and 43.8% were females with mean

age of 6 yrs and 6 months.¹⁸ Ron et al 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.¹⁹ Valerie et al found in their study that 53% were females and 47% were males with mean age of 6 yrs.²⁰

It is a consensus among various authors that adenoid or adenotonsillary hyperplasia is the main cause of SDB among children adenoidectomy (or adenotonsillectomy) have been, therefore, procedures of choice for the treatment of most cases of SDB in the pediatric population.²¹⁻²⁴ These procedures have shown positive results in reverting the physical effects of SDB.²⁵⁻²⁸ Adenoidectomy/adenotonsillectomy not only revert the organic changes caused by SDB, but also have shown their value in improving the quality of life of children and the perception of this quality by their caretakers. Recent papers are evidence of this important theme.²⁴⁻³⁴ In the present study of 47 patients 41 (87.23%), 4 (8.51%) underwent adenotonsillectomy and tonsillectomy respectively.

Pediatric SDB is viewed as a continuum of severity based on the degree of upper airway narrowing, arousal, and gas exchange abnormality ranging from snoring to upper airway resistance syndrome (UARS) to OSA. In the present study of 112 patients Snoring, mouth breathing and frequent awakening were the most common presenting symptoms with 85.71% presented with Snoring, 81.25% presented with mouth breathing and 66.07% presented with frequent awakening. Juglodigastric lymphadenopathy, high arched palate were the most common signs with 60.71% juglodigastric lymphadenopathy and 59.82% High Arched Palate. 33 (29.47%) patients had grade 2 tonsils and 18 (16.07%) had grade 3 tonsils. Niran et al 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.³⁵ Valerie et al 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.²⁰ Grade 3 and grade 4 adenoids were seen in 51% and 21.7% respectively. PSG (polysomnography) is recognized as the gold standard for establishing a diagnosis of OSA, constraints such as its limited availability and expense have left many clinicians searching for more a more widely available and less costly diagnostic tool.³⁶ studies have evaluated the usefulness of questionnaires to identify OSA. One such questionnaire is the OSA-18, which is a disease-specific quality-of-life questionnaire commonly used by pediatric otolaryngologists.³⁷ The OSA-18 questionnaire, developed by Franco et al was applied in three moments to the caretakers of children including in this study to assess the quality of life of these patients.²⁹ In the first of these moments - a preoperative - a baseline score was obtained as a parameter for assessing the quality of life of children before adenoidectomy or

adenotonsillectomy. Higher end OSA-18 scores correlate with more frequent and important clinical repercussions in the quality of life of children.

Patients scoring below 60 experience low impact on their quality of life. Patients scoring between 60 and 79 are moderately affected; if the score is 80 points or over, there is major impact on the quality of life. 2 months after surgery the same caretakers answered the questionnaire again to provide a recent postoperative score of the child's quality of life. Patients were re-examined to assess the postoperative state of the palatine and pharyngeal tonsillary beds. Finally, a late postoperative assessment was made of patients 6 months after surgery. The OSA-18 questionnaire was applied again to the same initial caretaker, and patients underwent a physical exam; the aim was to assess the long-term effects on the quality of life of children.

In the present study of 47 patients OSA-18 questionnaire was used pre-operatively, at 2 months, at 6 months. OSA-18 questionnaire when used pre-operatively showed majority of patients 33 (70.21%) having score >80, and 14(29.79%) patients having score between 60-80.No patient was below 60 score. Mean OSA-18 score pre-operatively was 84.15.OSA-18 score at 2 months and at 6 months were 30.06 and 26.40 respectively, which showed a lot of improvement in post-operative score and hence the post-operative quality of life. Junior et al in their prospective study of 48 patients found that before surgery, the average OSA-18 score was 82.83 (SD=12.57).¹⁸ With in thirty days after surgery, the average OSA-18 score was 34.3 (SD=9.95), both showing significant reduction (p<0.001). Thirty-four children (70.83%) were re-evaluated between 11 and 30 months (average=16.85; SD=5.16). The average OSA-18 score was 35.44 (SD=19.95) with an average global score of 9.28 (SD=1.78).Thus they concluded that surgery improves quality of life of children with OSD, which is consistent with the results of our study. Valerie et al in their study used OSA-18 QUESTIONNAIRE pre and post-operatively.²⁰ OSA-18 scores showed improvement post-operatively in all domains, which is consistent with our study. Franco et al in their study also found that there was a great improvement in quality of life in patients undergoing adenotonsillectomy, which is consistent with our study. Serres et al performed a multi-institutional study to evaluate the quality of life in children undergoing adenotonsillectomy using OSA -6 which showed improvement in the quality of life.³¹

In the present study, in 65 patients OSA-18 questionnaire was used pre-conservative, at 2 months, at 6 months of treatment. OSA-18 questionnaire when used before conservative treatment showed majority of patients 44 (67.6 9%) having score 60-80, and 21 (32.30%) patients having score between >80. No patient was below 60 score.OSA-18 score at 2 months showed improvement in 69.23% patients (<40), OSA-18 at 6 months showed recurrence in 12.33% patients. Thus showing that

conservative management is inferior to surgical management in the treatment of SDB.

CONCLUSION

SDB have a substantial impact on qol in pediatric patients. Quality of life significantly improves following adenotonsillectomy. There is also a subset of patients 12.33% with SDB in whom there was recurrence of symptoms after conservative treatment. Thus showing that conservative management is inferior to surgical management in the treatment of SDB. SDB improved after an observation period. Thus, observation with close follow-up is another treatment option.

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