

## Health Related Quality of Life in Children after Adeno-Tonsillectomy for Sleep Disordered Breathing

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**ABSTRACT:** **OBJECTIVES:** The objective of this study was to measure the Health Related Quality of Life (HRQOL) in children after adeno-tonsillectomy for sleep disordered breathing. **STUDY DESIGN:** Prospective, Comparative study. **SETTING:** Ganesh Man Singh Memorial Academy of ENT & Head & Neck Studies, Tribuvan University Teaching Hospital, Kathmandu, Nepal. **DURATION:** Twenty two months from 1st October 2008 to July 2010. **SUBJECTS AND METHODS:** Children less than 13 years of age with sleep disordered breathing due to adeno-tonsillar hypertrophy either undergoing adeno-tonsillectomy or being managed conservatively were included in the study. The children undergoing surgery comprised the surgical group where as those managed conservatively comprised the non-surgical group. OSD-6 questionnaire which was translated into the Nepalese language was used to assess the Health Related Quality of Life in both the groups. Paired Student's t-test was used for the analysis of difference of means within the same group and one way ANOVA was used for the analysis of difference of means among the different groups. **RESULTS:** Fifty-two children were enrolled in the study, thirty-six in the surgical group and sixteen in the non-surgical group. Out of them, there were thirty two boys and twenty girls. Mean OSD-6 scores were found to have significantly reduced post-operatively in the surgical group ( $p < 0.001$ ). There was no significant difference in the mean OSD-6 scores of children in the non-surgical group at subsequent evaluations. **CONCLUSION:** There was significant improvement in the quality of life after adeno-tonsillectomy in children with sleep disordered breathing due to adeno-tonsillar hypertrophy.

**Key Words:** Sleep disordered breathing, Adeno-tonsillectomy, Quality of life, OSD-6 questionnaire

**INTRODUCTION:** Sleep disordered breathing (SDB) is a spectrum of airway obstruction which encompasses simple snoring, upper airway resistance syndrome (UARS) and obstructive sleep apnoea syndrome (OSAS), depending upon severity. Sleep disordered breathing is a commonly encountered condition in the paediatric age group. This condition is associated with considerable morbidity and complications as a result of which the quality of life of children is adversely affected. There is growing evidence that even simple snoring may not be as benign as it is thought to be. Studies showed that secretion of growth hormone is reduced in children with simple snoring and these children have a higher incidence of neurocognitive disorders<sup>1</sup>. There are evidences that if this condition is untreated, quality of life suffers significantly in children and it may results in significant morbidity like failure to thrive, pulmonary hypertension and cor pulmonale<sup>2</sup>. Adeno-tonsillar hypertrophy leading to SDB is one of the commonly made diagnoses in paediatric otorhinolaryngology. It can significantly affect health related quality of life of the patient. The treatment options available are continuous positive airway pressure and weight reduction in obese children which are poorly tolerated by the pediatric patients. Thus the treatment of choice for children with SDB due to adeno-tonsillar hypertrophy is adeno-tonsillectomy<sup>3</sup>. In children it is thought to improve the quality of life. Adeno-tonsillectomy, a frequently performed surgery in children is also associated with considerable morbidity. Obstructive Sleep Disorder (OSD-6) questionnaire is a validated tool to measure disease specific health related QOL in patients with obstructive sleep disorders utilizing six health related questions, asked from parents or caretakers at different stages of management.<sup>4</sup>

The objective of this study was to measure the health related quality of life (HRQOL) using OSD-6 questionnaire in children with sleep disordered breathing before and after treatment.

**SUBJECTS AND METHODS:** This study was conducted over a period of 22 months from 1st October, 2008 to 31st July, 2010. Ethical clearance from the Institutional Review Board was obtained. Children less than 13 years of age with SDB due to adenoid and/or tonsillar hypertrophy and children undergoing adenoidectomy, tonsillectomy and / or adeno-tonsillectomy for SDB were included in the study. Children with SDB due to other causes like syndromes, cerebral palsy, neurological disorders, deviated nasal septum, children whose care-takers were not definite, those with cleft palates, previous pharyngeal surgeries, psychiatric disorders and those children whose parents were unable to read or understand the questionnaire were excluded from the study. The OSD-6 questionnaire was translated in the Nepalese language and a pilot study was carried out to validate the tool. Patients were diagnosed on the basis of history and clinical examination and were enrolled in the study after taking informed consent from the parents/ caretakers. Cases were taken up in the non-surgical group if they refused surgery and were treated conservatively. Patients presenting with severe symptoms and requiring immediate surgical intervention were enrolled in the surgical group. Children in the surgical group were evaluated a day prior to surgery, on the 7th postoperative day and 6-10 weeks post operatively. They underwent adenoidectomy by curettage method and tonsillectomy by cautery dissection method. Children in the non-surgical group were evaluated on the day of diagnosis, 1 week after that and then after 5 weeks from

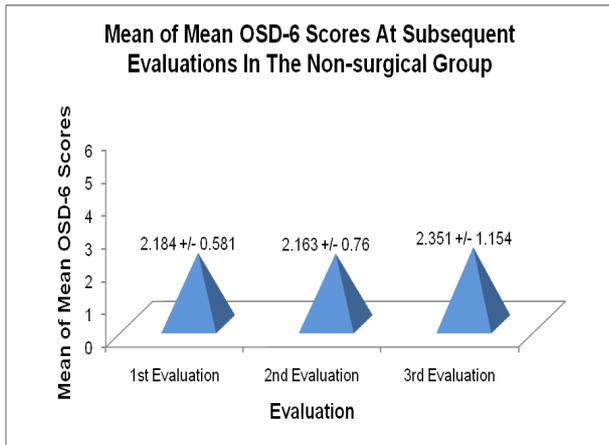


Figure-1: Mean of Mean OSD-6 Scores At Subsequent Evaluations In The Non-surgical Group p-value (1st vs 2nd Evaluation): 0.856; p-value (2nd vs 3rd Evaluation): 0.156; p-value (1st vs 3rd Evaluation): 0.417

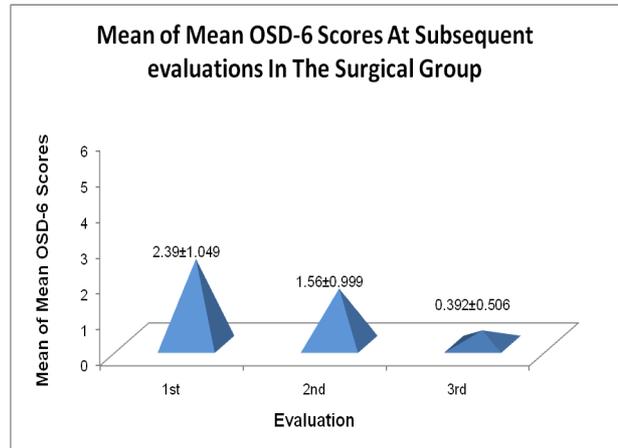


Figure-2: Mean of Mean OSD-6 Scores At Subsequent Evaluations In The Surgical Group p-value (1st vs 2nd Evaluation): <0.001; p-value (2nd vs 3rd Evaluation): <0.001; p-value (1st vs 3rd Evaluation): <0.001

the second evaluation. The OSD-6 questionnaire that was translated and validated in the Nepalese language was used. It was explained by the researcher and filled in by caretakers/ parents at each evaluation. A mean score was obtained by dividing the total score at each evaluation by 6. On subtracting the mean scores at subsequent evaluations from the mean score at 1st evaluation, if a positive score was obtained that denoted improvement and if a negative score was obtained that denoted deterioration of patient as compared to the 1st evaluation. Statistical analysis was carried out using SPSS 17.0 software. Paired Student's t-test was used for the analysis of difference of means within the same group and one way ANOVA was used for the analysis of difference of means among the different groups. P-value of 0.05 was taken as standard reference value with confidence interval of 95%.

**RESULTS :** A total of 57 children were initially included in the study out of which 5 were excluded, 1 from the surgical group and 4 from the non-surgical group. They were excluded from the study because they did not turn up for follow up. So finally total number of children included in the study was 52 cases, 36 in the surgical

group and 16 in the non-surgical group. Out of the 36 patients in the surgical group, 16 were girls and 20 were boys. Out of the 16 patients in the non-surgical group, 4 were girls and 12 were boys. Age range was 2-12 years with an overall mean age of 6.22 years. Mean age in the Non-surgical group was 6.56 years and that in the surgical group was 6.07 years. The mean OSD-6 scores at 1st, 2nd and 3rd evaluations in the non-surgical group were found to be 2.184±0.581, 2.163±0.76 and 2.351±1.154 respectively (Fig.1). There was no significant difference found in the mean OSD-6 scores at 1st, 2nd and 3rd evaluations in the non-surgical group (p > 0.05). The mean OSD-6 scores at 1st, 2nd and 3rd evaluations in the Surgical Group were found to be 2.39±1.049, 1.56±0.999 and 0.392±0.506 respectively (Fig.2). Overall mean OSD-6 scores were found to have significantly improved at subsequent evaluations as compared to previous ones after surgery. On comparing the mean OSD-6 scores at subsequent evaluations between surgical and non-surgical groups. Mean OSD-6 score at 1st evaluation in the surgical group was found to be relatively higher although not significant as compared to that of non-surgical group. The mean score post-operatively was found to be significantly lower in surgical group at 2nd and 3rd evaluations as compared to non-surgical group (Fig.3).

**DISCUSSION:** SDB is a common and important paediatric health problem. Because of difficulties in defining the condition, the exact prevalence is not known but it is believed that it may be as high as 11%<sup>5</sup>. It does not only cause night and day-time symptoms like snoring, restlessness, difficulty in breathing, sweating, enuresis, morning headache and daytime somnolence but has also been attributed to mental dullness and lethargy. This may lead to hampering of school performance. Untreated SDB may lead to complications like failure to thrive, behavioural and neurocognitive problems, learning difficulties and even cardiopulmonary complications like pulmonary hypertension and cor pulmonale<sup>6,7</sup>. These may result in adversely affecting the quality of life of a child<sup>8</sup> which could be a significant distressing factor for the parent. In the context of SDB, QOL describes its net consequences on the child's daily activities, physical symptoms, social interactions, and emotional well being. The effect of adeno-tonsillectomy on these areas of

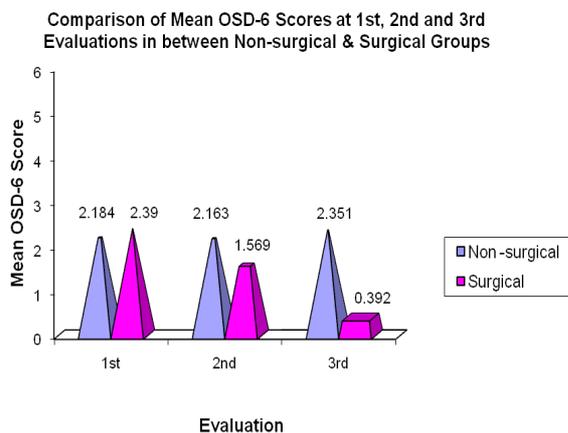


Figure-3: Comparison of Mean OSD-6 Scores at 1st, 2nd and 3rd Evaluations in between Non-surgical and Surgical Groups.

functioning is an important information for parents considering the procedure for their child and is an evidence of the procedure's effectiveness. The OSD-6 questionnaire which is a validated assessing tool<sup>4</sup> was translated into the Nepalese language and was given to the caretakers to be filled. It is important to consider this existing tool to be adapted with slight modification in the national language of the population being studied<sup>9</sup>. The researchers should undertake comprehensive literature searches to ascertain whether a suitable measure is available before they decide to develop a new measure<sup>10</sup>. We used a previously existing validated instrument rather than generating our own. Children whose caretakers were not definite were excluded from the study as data obtained from those patients was unreliable. Similarly, the caretakers who could not read or understand the questionnaire were also excluded from the study to reduce bias. We came across one such patient whose caretaker could not read the questionnaire and also this patient in the non-surgical group did not visited for follow up and so was excluded from the study. Like in other outcomes studies, we carried out a longitudinal study by measuring change in QOL before and after surgery or over a period of time in those who didn't undergo surgery. The advantage of such a study is that every patient acts as his/ her own control thus reducing the possibility of bias. We also compared the mean OSD-6 scores of surgical and non-surgical groups which to the best of our knowledge were not done in any other study in the literature. There are longitudinal studies on QOL in children with OSAS but no comparative study was found. The peak incidence of disease is between three and seven years of age<sup>11</sup> which is in conjunction with our study where maximum numbers of children were below 10 years of age. The mean age in our study was 6.22 years, which is similar to the results obtained in a reported study<sup>12</sup>. However, the mean age in the study by Beraldin et al. was found to be slightly higher<sup>13</sup>. There was no significant change in mean OSD-6 scores at the 2nd and 3rd evaluations as compared to the 1st evaluations in the non-surgical group. From this, we can infer that there is no change in patient's QOL status with conservative and/or no treatment over a duration of 1 ½ to 2 months. These results are similar to those obtained in a study where the patients were evaluated twice before surgery within a mean duration of 31 days (range 4 to 162 days) and found very trivial difference in scores preoperatively<sup>12</sup>. Although the combined mean OSD-6 scores in our study had significantly reduced at the 2nd evaluation, that is 1 week post-operatively, there were 6 cases in which the mean score had actually increased. This increase was in the domains of speech and swallowing disturbances, sleep disturbance and in caregivers concern. Since pain was the major factor for morbidity following adeno-tonsillectomy and persisted for 1 week post-operatively, these children with increased OSD-6 scores may be having difficulty in swallowing. As it may take up to 3-6 weeks for obstructive symptoms to subside following adeno-tonsillectomy, sleep disturbance may be persistent leading to a rise in score in few cases. This in turn may lead to an increased score in the caregiver's concern domain. The mean OSD-6 scores were found to have significantly improved post-operatively. Beraldin et al too had similar findings in their study<sup>13</sup>. Our results regarding improvement in QOL are also in accordance

with the conclusion of Mitchell and Kelly's literature review which states that adeno-tonsillectomy leads to improvement in sleep, behavior, neurocognition and QOL<sup>14</sup>. There was significant improvement in the mean OSD-6 scores at 6 weeks post operatively as compared to 1 week post-operatively. This improvement may be attributed to the fact that at 1 week post-operatively, the effects of surgery may not have completely worn off which can be settled by 6 weeks post-operatively. In our study we also observed a difference in the mean OSD-6 scores at 1st evaluation between the surgical and non-surgical groups though not statistically significant. This may indicate a selection bias in our part that patients with a worse QOL were taken up for surgery and a wait and watch policy adopted for those with a better QOL. Statistically significant relationship was observed in the difference of scores at 1 week post-operatively between the two groups which became highly significant at 6 weeks post-operatively.

**CONCLUSION:** Adeno-tonsillectomy for SDB due to adenotonsillar hypertrophy results in significant improvement of QOL in short term. There is no significant change in QOL with conservative management.

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