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OBSTRUCTIVE SLEEP APNOEA

KEY WORDS:

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ABSTRACT

Introduction: Obstructive sleep apnoea (OSA) is characterized by repetitive upper airway obstruction leading to sleep disturbance, cardiovascular stimulation and decrease oxygenation during sleep. This study was carried out to detect the structural changes in the upper airway, locate the site of obstruction, and evaluates the validity of methods available for diagnosis and treatment of OSA.

Methods and methodology: This is a prospective study. 50 patients with symptomatology of OSA were selected. A detail history with questionnaires for adults and children, clinical, haematological, radiological, endoscopic examination and treatment strategy for the individual patient was formulated.

Results: In our study, OSA was noted both in children (mean age 8.16 years) and adults (mean age 43.28 years). OSA specific symptoms were snoring(100%) breathing pauses (74.28%), restless sleep (51.42%), morning headache (62.85%), etc. In children mouth breathing (100%), restless sleep (86.66%), recurrent URI (73.33%) behavioural changes (20%) poor attention span (40%) were noted. Clinical examination in children revealed adenotonsillar (60%) adenoid (20%) tonsillar enlargement (13.34%) as common causes. In adults, disproportionate upper airway anatomy at multiple levels with or without skeletal malformation, nuchal obesity and generalized obesity was the most important cause. Multiple treatment modality were used in adults suiting individual needs e.g. NCPAP, adenotonsillectomy, weight reduction, thyroid hormone replacement etc. In childen surgical treatment was used in all cases. 66.67% children showed marked improvement, (71.42%) adults showed marked and (28.57%) moderate improvement.

Conclusion: The site of upper airway obstruction in adults is at multiple levels and involves both soft tissue and skeletal structure. In children it is adenoids and/or tonsils, and facial dimorphism in some cases. Meticulous clinical and upper airway endoscopic examination along with radiological examination is required to detect the above. Most common mode of treatment in adult is CPAP.

INTRODUCTION

Obstructive sleep apnoea (OSA) can be regarded as a condition characterized by repetitive upper airway obstruction leading to sleep disturbance , cardiovascular stimulation and decrease oxygenation during sleep. Together, these lead to symptoms such as snoring, unrefreshing sleep,excessive daytime sleepiness (EDS), and the increased risk of cardiovascular disease, hypertension, insulin resistance, cerebrovascular disease and road traffic accidents.

Aggravating factors may include alcohol consumption[1], active and passive smoking,[2] obesity,[3], reflux,[4] male gender[3], increasing age and diabetes mellitus. Factors including BMI, neck soft tissue mass, parapharyngeal and lingual adipose deposition, and body fat distribution all play a role.

OSA is a more severe form of airway dysfunction which leads to impaired sleep quantity and quality resulting in excessive daytime sleepiness [6](Hypersomnelescence). Airway dysfunction results from anatomical narrowing as well as abnormal neuromuscular control in these patients. Common abnormalities leading to airway narrowing include: deviated nasal septum, inferior turbinate hypertrophy, nasal polyp/mass, nasopharyngeal mass or tumor, lingual tonsillar hypertrophy, vallecular cyst, redundant aryepiglotitc folds, soft palate / Uvula elongation, adenotonsillar hypertophy, macroglossia, retrognathia, and micrognathia.

Continuous positive pressure (CPAP) therapy is the only effective non surgical method to treat OSA patients, who fail to qualify for surgery and want an alternate therapy but it is only applicable to OSAS patients not for simple snoring patients.
Surgical management includes volumetric reduction of the soft tissues of the upper airway by surgical techniques like the surgery of the tonsils, adenoids, palate, lateral pharyngeal wall, tongue, hyoid and the bony skeleton of the face like the mandible and the maxilla, nasal septum hypertrophied turbinates, nasal polyp and mass and nasopharyngeal mass or tumor.

With this background this study is being carried out to detect the structural changes in the upper airway, locate the site of obstruction, evaluate the validity of methods available and formulate a treatment protocol for management of OSA.

The main aims and objectives of this study is to evaluate the morphological and structural changes and the site of obstruction in the upper airway of the patients of OSA . To evaluate the various methods available to help in the diagnosis of the upper airway obstruction and various treatment methods available for the correction of the soft tissue and skeletal obstruction causing OSA.

MATERIALS AND METHODS

This study was a prospective study conducted in the Department of Otorhinolaryngology NATIONAL INSTITUTE OF MEDICAL SCIENCES 50 patients with complaints of snoring with other symptomatology of obstructive sleep apnea attending outpatient department of otorhinolaryngolo gy were selected.

A detailed sleep history was obtained from the patient and his bed partner in adults and from the parents in case of children. The symptomatology in children and in adults is markedly different.

In case of children, symptomatology is different snoring, mouth breathing, excessive sleepiness, restless sleep, breathing pauses, frequent cold, noctural choking, difficulty swallowing, nasal discharge, mood swings, poor attention span, failure to thrive, enuresis, aggressive or hyperactive

behaviour. Points includes in history of adult patient are regarding blood pressure, hypothyroidism, history of addiction to smoking/alcohol/sedative any history of recent increase in weight ,family history of snoring and work-history.

Following detailed analysis of symptoms and associated medical problems- meticulous clinical examination was carried out. General survey most important weight, height, calculation of BMI, blood pressure etc. ,examination of face and neck ,mouth breathing ,neck circumference at the level of criocothyroid membrane

Upper airway endoscopy was carried out to note the site of obstruction.

Systemic examination to rule out contributing factors of complications of the disease.

All the patients underwent baseline haematological and urine examination. Thyroid hormone profile and lipid in blood were tested in all adult patients. Radiological examination of the airway was performed in all the patients. Skiagram [5] of the soft tissues of neck in lateral view was procured from all the patients and studied. Assessment of the soft palate length, the posterior airway space, and the hyoid position was done and the site of obstruciton noted.

X ray PNS PA waters view done in patients having nasal symptoms.

The patients were followed up at regular intervals of a week initially for a month subjective and objective assessment of improvement of symptoms and then biweekly for 2 months.

OBSERVATION AND RESULTS

50 patients with complaints of snoring with the symptomatolo gy of obstructive sleep apnea were studied during the period Dec 2018 to Jan 20. There were 35 adults and 15 children included in study.

In the present study, there was bimodal distribution with respect to age of the patients. Maximum number of children were between 6-10 years with mean age 8.16 years. Maximum number of adult patients were between 41-60 years with mean age of 43.28 years. Snoring and excessive daytime sleepiness in permissible situation was the most frequent complaint 71.42%in these patients. Morning headahce, dry mouth and unrefreshing sleep were reported by 62.85%, 77.14% and 48.57% of the patients respectively. On elicitation of history from the bed partner, they had witnessed breathing pauses in 74.28% of the patients . Poor concentration was seen in 60% of patients. Drooling of saliva at night was complained in 34.28% patients. nocturia was seen in 20% patients, 17.14% had positive history of nocturanl choking. 11.42% patients were suffering from depression & personality changes each.

Generalized obesity and nuchal obesity are contributing factors to the development of OSA particularly in adult patients.Approximately 34% of the adults in our study who snored were overweight and 40% were obese. There were also 6 adults i.e., 17% of them who had healthy weight but had still come with complaints of snoring.

Among children generalized obesity was less commonly noticed. Only 20% patients are overweight. On the other hand there were 6.67% of the children who were found underweight.

In our adult patients, palate and uvula were most common sites of obstruction. Palate was long and thick in 54.28% patients and 22.85%patients had long soft palate. The palate was normal in 22.85% patients 60% children had enlargement of adenoids as well as tonsils. 20% of children had only enlargement of adenoids and 13.33% children had tonsillar enlargement. Study of thyroid hormone profile and lipid profile in blood was done in all the patients 5.71% of our patients were found hypothyroid whereas others had normal thyroid hormone profile. 20% of the patients showed raised lipid profile. 9 adults (25.71%) had shown hypertension and 1 patients (2.85%) of them had arrhythmias in form of brady cardias during apneas.

All the children had received surgical mode of treatment 4 (26.66%) children underwent adenoidectomy ,10 children (66.67%) underwent adenotonsillectomy. 1 child (6.66%) underwent tonsillectomy. In adults the main mode of treatment given was CPAP . CPAP with weight treatment given in 13 patients (37.14%). CPAP alone and combination treatment given in 21 patients (60%).

1adult overweight with adenoid enlargement underwent adenoidectomy with wight reduction. 4 adults with enlarged tonsils was treated with tonsillectomy.out of 4 patients 2 adult were hypothyroid and hence recieved thyroid hormone replacement. Obese patients were aviced to loose weight. 2 adults person had nasal polyp so intra nasal polypectomy was done. 3 adult patients had obstructive type DNS hence undergone septoplasty with CPAP , 2 patients had large inferior turbinates and out of 2 patients 1 had long and thick palate also so turbinectomy was done in one and turbinectomy with CPAP was done in another. One patient had lump sensation in thorat , on endoscopic examination vallecular cyst was found. cyst was excised.

In 6 patients we didn't find any upper airway obstruction. Only one finding commonly present was obesity. All 6 patients were obese, conservative treatment was given to them which includes reduction of weight and improve sleep hygiene and change in life style, avoidance of alcohol and smoking(out of 6 pts. 4 were smoker and alcoholic).The patients were followed up post- treatement and assessed for the degree of relief in various symptoms. The results are summarized in the table below:

Follow Up 3 months following treatment in children (n=15)

Improvement	No. of Patients	Percentage
Markedly Improved	10	66.67
Partially Improved	4	26.67
Not Improved	1	6.67

The pediatric patients showed significant improvement in both their day and night time symptoms , showed improvement in their behavior problems and better in school. 10 children improved markedly, 4 partially improved and 1 was not improved.

Follow Up 3 months following treatment in adult patients (n=35)

Improvement	No. of Patients	Percentage
Markedly Improved	25	71.42
Partially Improved	10	28.57

In adults 25 patients (71.42%) were markedly improved. 10 patients (28.57%) were partially improved.

DISCUSSION

Patients from all age groups with complaints of snoring with other complain of OSA were evaluated, treated and made a part of the study. All the children included in the study received surgical treatment while adults received various modalities of treatment like weight management, surgery,CPAP etc. The patients were followed up post-treatment at regular intervals of a week initially for a month subjective assessment of improvement of symptoms and then

biweekly for 2 months. (total 3 month follow up).

The most common symptoms or observations made by the bed partner are snoring, excessive daytime sleepiness, nocturnal gasping and witnessed apneas (American Sleep Disorders Association). In children there were frequent episodes of URTI , difficultly in swallowing associated tonsillar enlargement ,behavioural changes (mood swings, aggressive behaviour) and enuresis were noted paediatric patients.

Polyuria was a more common complaint in the adult group.

Tonsillar size in adults did not show much correlation with sleep study in our anlaysis. OSA Patients had long palate as the most common abnormality. Clinical (Head-mirror and endoscopic) examination revealed adenotonsillar enlargement as the most common cause of upper airway obstruction leading to sleep apnea syndrome (60%). Adenoid enlargement alone was responsible for OSA in 20% of our paediatric cases. Tonsillar enlargement without adenoid hypertrophy was seen 13.33% children. In our study, 10 children were subjected to adenotonsillectomy and 4 children with adenoid enlargement only underwent adenoidectomy. All of them had improved quality of life following surgery.

In case of adults, unlike in children with adenotonsillar enlargement, the site and level of obstruction. Since, it acts as a pneumatic splint and opens up the entire upper airway by positive pressure without a need to know (Sullivan et al, 1989) Hence, NCPAP weight management and proper sleep hygiene constituted the main modality of treatment in adults .

NCPAP has a very low risk, is immediately and demonstrativel y effective. Infact, the effetiveness following NCPAP is comparable only to effectiveness following tracheostomy. NCPAP eliminates obstructive apneas in more than 60% of patients who can tolerate CPAP trail (Sullivan et al, 1989).

2 out of 35 (5.71%) of our patients were diagnosed hypothyroid on haematological examination. The incidence of hypothyroidism is comparatively higher. 1 patients out of 35 (2.86%) were manged by thyroid hormone replacement; weight management. 1 hypothyroid patient (2.86%) needed initial support with weight reduction and NCPAP. Institution of thyroid replacement therapy may be associated with nocturnal againa pectoris especially in patients who do not have immediate alleviation of sleep apnea but do have metabolic augmentation with replacement therapy and hence CPAP may be required in the initial phase of management (Grunstein RR et al, 1988).

In conclusion it can be said that all patients who present with significant snoring should be properly evaluated and managed suitably at the earliest to prevent potentially serious complications.

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