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EFFECT OF STEROID SPRAY ON ADENOIDS AND THE CORRELATION OF RADIOGRAPHIC AND ENDOSCOPIC FINDINGS IN ASSESSING THE PEDIATRIC PATIENTS.

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ABSTRACT

OBJECTIVE: To determine the effect of steroid spray on adenoids and the correlation of radiographic and endoscopic findings in assessing the pediatric patients during a one-year period **STUDY DESIGN:** Cross sectional study. **PLACE AND DURATION OF STUDY:** Department of Pediatric surgery of Peoples University of Medical & Health Sciences for Women, Shaheed Benazir Abad, Sindh (June 25, 2022 to June 24, 2023). **SUBJECTS AND METHOD:** 83 patients of age bracket of 2 years to 19 years with nasal obstruction, discharge, mouth breathing, sleep apnea, ear complaints, with adenoid tissue on x-ray imaging and with clinical symptoms of adenoid hypertrophy lasting consistently for 6 months were included. Patients were assessed clinically along with endoscopic and radiographic assessment followed by pharmacological management with corticosteroid nasal spray. Mean + SD deviation was determined for quantitative variables, whereas frequency and percentages were derived for qualitative variables. Pearson's Correlation was used to determine the correletion between A/N ratio and Endoscopic results. Statistical package for social science (SPSS) software version 26. **RESULTS:** The most of the children 36 (43%) were found in age group between 6-10. Male Female ratio was 2.4:1. A significant improvement has been found in clinical symptoms after steroid nasal spray usage. The A/N ratio and endoscopic adenoid size were found significantly positively correlated (r=+0.46, p=0.01). **CONCLUSION:** A significant correlation between the A/N ratio and endoscopic adenoid assessment. Furthermore, the use of steroid nasal spray as a treatment technique for the conservative management of adenoid hypertrophy is also very beneficial.

KEY WORDS: Adenoid, Adenoidal-nasopharyngeal ratio, Transnasal endoscopy, X-ray nasopharynx

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INTRODUCTION

Adenoids are a mass of tissue at back of nasal cavity & significant part of the immune system and help in reacting against the foreign bacteria in children. According to the otolaryngologist, in contrast to adults, adenoidal obstruction is the most frequently occurring problem in pediatric population.[1] In 1661, adenoids were first noted by Conrad Victor Schneider and further in 1842 it was seconded by James Yearsley.[2]

Among the many clinical symptoms presented by patients with adenoids, the most common are nasal obstruction, mouth breathing, snoring, hypo nasality of voice and nasal discharge.[3,4] Following the clinical history, adenoids are diagnosed by a physical examination of the throat followed by endoscopy through the nose to view the adenoids. Other established methods include anterior and posterior rhinoscopy[5], inspection of ear & radiologically.[6, 7]

Nasal endoscopy has been preferred in previous works compare to other methods involving physical palpation and lateral radiographs.[8] Numerous techniques, including nasal endoscopy[6], rhinomanometry[7], acoustic rhinometry[8], and radiologic imaging modalities[9], have been proposed in the literature to evaluate adenoid size.

In most cases, physicians advise to wait for adenoids to shrink on its own when they are not infected. However, if infected, nasal corticosteroids and antibiotics are prescribed as treatment. In conditions where acute nasal obstruction occurs or otitis media, ear confusion is observed, adenoidectomy is the most common procedure that is carried out. [9]

Some studies also indicate that identification of adenoids in early age can help surgeons in treating the patients better[10]. Our study aimed to evaluate the less invasive radiographic assessment in contrast to endoscopy as diagnostic tests for adenoids in children and the effect of steroids to decrease the overall problem contributing to morbidity and mortality in children. Therefore, this study aimed to determine the effect of steroid spray on adenoids and the correlation of radiographic and endoscopic findings in the pediatric patients.

METHODOLOGY

This study was carried out at the Pediatric surgery department, PUMHSW, from June 25, 2022 to June 24, 2023 after approval from Ethical Review Committee [PUMHS/SBADME/086]. A total of 83 patients of aged between 2-19 years of either gender presented in the OPD of the hospital meeting the following eligibility criteria were included in the study via non-probability consecutive sampling technique:

INCLUSION CRITERIA

Patients had symptoms consistent with adenoid hypertrophy that lasted six months or longer, no prior history of adenoidectomy, and nasal discharge/obstruction, mouth breathing, sleep apnoea, ear complaints, etc. were included. Adenoid tissue was also seen to be significantly obstructing the nasopharynx on the x-ray nasopharynx lateral view for soft tissues.

Patients who have had an adenoidectomy in the past, who have had an upper airway infection in the last two to three weeks, who have nose anatomical abnormalities, or who suffer from any Sino nasal disorders, Individuals diagnosed with cardiovascular problems, neurological disorders, obstructive sleep apnoea, and allergic rhinitis were excluded.

The sample size was done using the Rao soft sample size calculator by using the proportion of 99.6% confidential interval and 9% margin of error, the sample size stands to be n=83.

A thorough clinical history was obtained in each case, paying particular attention to any issues with the nose, nasopharynx, or otology. A general examination, a lateral view x-ray of the nasopharynx with the

mouth open, and a full blood count were then performed and documented. Voice, craniofacial anomalies, and adenoid facial features were assessed. The ear was checked for acute or chronic otitis media, as well as otitis media with effusion.[7] A diagnostic nasal endoscopic examination was then performed. The patient was then treated with a corticosteroid nasal spray as a nonsurgical means of managing the symptoms, and after four weeks of use, the patient was assessed once more.[11]

SPSS -26 software was used for data analysis. For quantitative data, mean + SD was calculated, while for qualitative data, frequency and percentages were calculated. Spearmen correlation was used to assess the correlation in the two methods. Further the effect of steroid spray was evaluated using scores before and after 4 weeks post usage. Finally, the size of adenoid helped us reach on outcome of our findings. P-value= or ≤0.05 was taken as significant.

RESULTS

The majority of the cases were in the 6–10 age group 36 (43%), only 3 (3.6%) of the patients had age > 15 years and 17 (21%) were in the under-5 age group. Male Female ratio was found nearly 2.4:1 in current study, 59 (71%) and 24 (29%) patients respectively. 51 (61.5%) had duration of symptoms > 1 year, **as shown in table-I.**

Commonest clinical symptoms improved with the steroid treatment are nasal discharge in 24, nasal obstructions in 22, mouth breathing in 32, snoring reduced in 11 and other symptoms decrease hearing in 2 and hyponasality in 7 patients, **as shown in table-II.**

In this study, it has been revealed that 10.8% of patients who were in X-ray grade 2 were in endoscopic grade 1 and 22.8% patients in X-ray grade 2 were in endoscopic grade-3, **as shown in table-III.** The mean A/N ratio was 19.15±5.33 and mean adenoid size on endoscopic examination, The A/N ratio and endoscopic adenoid size were found significantly positively correlated (r=+0.46, p=0.01), **as shown in table-IV.**

Table-I: Demographics data of the patients

Demographics data	n (%)
Age	
2-5	17 (21%)
6-10	36 (43%)
11-15	27 (32.5%)
16-19	3 (3.6%)
Gender:	
Male	59 (71%)
Female	24 (29%)
Duration of Symptoms:	
Less than and equal to 1 year	32 (38.5%)
Greater than 1 year	51 (61.5%)

Table-II: Improvement in Symptoms after Steroid Treatment (n=83)

CLINICAL SIGN & SYMPTOMS	PRE TREATMENT	POST TREATMENT
Nasal discharge	35	24
Nasal obstruction	35	22
Mouth breathing	52	32
Snoring	31	20
Decrease hearing unilateral	30	28
Hyponasality	57	50
Others	03	02

Table-III: Adenoid hypertrophy: X-ray and endoscopic grades (n=83)

Endoscopic Grades					Total
X-ray	**1**	**2**	**3**	**4**	
1	01	0	0	0	01
2	09	24	19	0	52
3	0	05	19	06	30
Total	**10**	**29**	**38**	**06**	**83**

Table-IV: correlation A/N ratio and adenoid size on endoscopic examination (n=83)

Variable	N	(Mean ± SD)	Correlation coefficient /p-value
Adenoid size on endoscopic examination	83	19.15±5.33	r= +0.46 p= 0.01
A/N ratio	83	0.825±0.099	

DISCUSSION

The most frequent cause of nasopharyngeal airway blockage in children is adenoid hypertrophy, which can result in a variety of clinical symptoms include sleep apnoea, mouth breathing, snoring, and recurrent airway infections.[11] The kid may show classic "ADENOID FACIES" with open mouth, monotonous appearance, a lengthened face, & dark circles under the eyes, but kids with other problems causing persistent nose blockage, like allergic rhinitis, also present with similar appearances. Due to children's unreliability in cooperating, posterior rhinoscopy is typically challenging to perform in order to measure adenoids in size.[12] As a tool for determining the size, shape, and location of adenoids, radiological examination of the nasopharynx is well-established. However, as far as we are aware, there are no consistent, objective standards for their assessment described in children <12years.[13,14] The only procedure that provides an excellent view of the nasopharynx is nasopharyngoscopy, making it the ideal method for measuring adenoid size in children. It is simple, minimally invasive outpatient technique that is carried out under LA which provides more useful information than imaging techniques & reduces exposure to radiation.[15] The majority of children with uncomplicated adenoid hypertrophy are treated with an adenoidectomy, but there are known risks involved with the procedure. Nevertheless, nonsurgical treatment for chronic adenoiditis might be tried in less severe situations. Numerous randomized control trials have demonstrated the effectiveness of steroid spray in treating chronic adenoiditis & allergic rhinitis.[16] In this study, we determined the effect of steroid spray on adenoids and the correlation of radiographic and endoscopic findings in the pediatric patients

Out of 100 patients in our study, 71 were men and 29 were women. The ratio of men to women is almost 2.4:1. Further, majority of patients (73%) were between the ages of 6 and 15; which are in line with those of Johannesson et al. 1968, who enrolled 140 kids (90 boys & 50 girls) of the ages of 3 months and 15 years.[17]

Clinical symptoms were observed in 85 of the patients, with hyponasal voice being the most prevalent symptom in 57 kids (69%) followed by mouth breathing in 52 (63%), snoring in 37 (31%), nose obstruction in 35 (42%), discharge from nose in 34 (42.4%), & discharge from ear in 30 (36.4%). These findings are consistent with MAWSON's (1979) research.[18]

The patient's parents and the patient themselves both subjectively reported a considerable reduction in symptoms at 4th week after receiving corticosteroid nasal spray. Our results support those of G. Ciprandi and A. Varrichio (2007) who found constant drop in adenoid size.[19]

Radiological assessment of postnasal area to identify adenoid size & postnasal airway were found to be weakly allied with their size at operation, according to Cohen et al., who also support invalid assessment of adenoid size by plain X-ray.[20] The nasal endoscope, on contrary, provided dependable, safe, & well-tolerated 3-dimensional vision. In this study, endoscopic examination was found to be more accurate than X-ray evaluation. In their evaluation of the adenoid size, Yilmas et al., Kindermann et al., & their colleagues corroborated these finding.[21,22] The study's findings also showed a strong positive association between the A/N ratio & endoscopic adenoid size. The findings of the study by Caylakli et al. about the link of the A/N ratio with measurements of the adenoid gland after surgery and pathological examination are supported by the findings of this study.[23]

In a study by Lertsburapa et al; on the relationship between adenoid size in nasal endoscopy and radiographic measurements, found a positive correlation and concluded that LNR could accurately predict denoid size.[24] It should be noted, too, that if the adenoid is too small in actual, ANR measurements tend to overstate its size. Additionally, if the true adenoid size is too large, it may be underestimated in the ANR assessment.[24]Some studies have published findings that contradict ours.[14,18] Mlynarek et al. found that a rise in the A/N ratio was inconsistent with adenoid expansion in video rhinoscopy when they compared the size of the adenoid in direct video rhinoscopy with radiologic adenoid size using ANR.[25]

In their investigation into significance of imaging studies in management of kids with adenoidal hypertrophy, Al-Kindy et al. found that roughly 30% of affected kids with elevated A/N ratio underwent an adenoidectomy.[26] Since more than 70% of patients with adenoidal hypertrophy based on their symptoms & examination were recovered medically, they concluded that imaging results had limited role in treatment of disease & cautioned against their frequent use.[26]

CONCLUSION

A significant correlation between the A/N ratio and endoscopic adenoid assessment has been found. Further, the use of steroid nasal spray as a treatment technique for the conservative management of adenoid hypertrophy is also very beneficial.

ETHICS APPROVAL: The ERC gave ethical review approval.

CONSENT TO PARTICIPATE: written and verbal consent was taken from subjects and next of kin.

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AUTHORS' CONTRIBUTIONS:

All persons who meet authorship criteria are listed as authors, and all authors certify that they have participated in the work to take public responsibility of this manuscript. All authors read and approved the final manuscript.

CONFLICT OF INTEREST: No competing interest declared

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