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Endoscopic Evaluation of Persistent Nasal Obstruction in Children of School Going Age

Dr Zubair Ahmad Lone[1], Dr Omar Mohammad Shafi[2], Dr Qurat Ul Ain Batool[3], Sajad Majid Qazi[4]

[1]Junior Resident ,Post graduate Department of Otorhinolaryngology & Head and neck surgery, Government Medical College , Srinagar, Jammu and Kashmir , India

[2] Senior Resident ,Post graduate Department of Otorhinolaryngology & Head and neck surgery, Government Medical College , Srinagar, Jammu and Kashmir , India Correspondance Address ; E8 , Effandibagh, Rawalpora , Bypass, Sanatnagar, Srinagar .PIN 190005

[3]Junior Resident ,Post graduate Department of Otorhinolaryngology & Head and neck surgery, Government Medical College , Srinagar, Jammu and Kashmir , India

[4]Professor ,Post graduate Department of Otorhinolaryngology & Head and neck surgery, Government Medical College , Srinagar, Jammu and Kashmir , India

Abstract: ***Endoscopic management of pediatric nasal obstruction in children of school going age is a safe and effective method and it guarantees successful outcome. The objectives of this study were to establish the advantages of endoscopic evaluation in pediatric patients of school going age with persistent nasal obstruction and to determine the correlations between symptoms described at presentation, and endoscopy. Patients aged 6-15 years having persistent nasal obstruction were included in the study. The results suggest that endoscopic evaluation of persistent nasal obstruction in children, despite the reservations expressed by many clinicians, is effective when optimal medical treatment proves unsuccessful. The different causes of nasal obstruction were evaluated with a higher degree of confidence as endoscopy permitted the exact visualization of sinonasal anatomy. The endoscopic management of persistent nasal obstruction in children is a safe, effective and reliable method in the patients who do not respond to the optimal medical management.***

Keywords: nasal obstruction, endoscopic evaluation, school going age.

1. Introduction

With the advent of rigid and flexible endoscopes both diagnostic and therapeutic approaches to sinonasal diseases in pediatric patients has changed. Endoscopy of the nasal cavities and nasopharynx permits observation of important anatomical areas that were previously not visible, helps in evaluating macroscopic characteristics of the sinonasal lesions and their relationship with the endonasal structures. In particular, some fundamental concepts of modern rhinology are based on endoscopic nasal findings and Messerklinger's investigations of the pathophysiology of sinus mucosa. These studies radically changed traditional understanding of sinus inflammation and revolutionized its treatment using endoscopic conservative surgical management[1, 2, and 3]. In the 1980s, Kennedy first utilized this surgical technique in the United States and termed it Functional Endoscopic Sinus Surgery (FESS). Due to the good results of FESS, in 1990s the development of smaller endoscopes and instrumentation adapted for pediatric patients was encouraged. The choice of nasal endoscope is related to the age and compliance of the pediatric patient. In compliant children and in those older than 8 years, 2.7mm and/or 4mm rigid nasal endoscopes are usually well tolerated and provide good endoscopic nasal views.[4]

2. Review of Literature

Nasal obstruction in the pediatric age group is posing a great challenge to the clinicians and with the advent of nasal endoscopes the management of nasal obstruction in pediatric age group has got revolutionized. Endoscopic management of pediatric nasal obstruction in children of school going age is a safe and effective method and it also guarantees successful outcome with a large level of patient satisfaction.

Relevant review of literature on the subject is reproduced as under: Shreeya V. Kulkarn et al (2015)[5] summarized that Nasal obstruction is the most common complaint in nasal and sinus disease. Deviated nasal septum is a very frequently encountered and common cause. Stankiewicz JA (1995)[6] carried out a study entitled "pediatric endoscopic nasal and sinus surgery". A total of 83 children and teenagers underwent endoscopic nasal and sinus surgery. Six patients had surgery for choanal atresia (4) and adenoid hypertrophy (2) and will only be briefly mentioned. Seventy-seven children and teenagers underwent endoscopic sinus surgery for acute and chronic sinusitis,

3. Problem Definition

Nasal obstruction in pediatric population is posing a great challenge to the clinicians with number of cases not responding properly to the medical management. Nasal endoscopy permits the exact visualization of the sinonasal anatomy and has proved to be efficacious and safe therapeutic means of management.

4. Methodology

This longitudinal study was conducted on 25 pediatric patients aged 6-15 years in the Postgraduate Department of Otorhinolaryngology, Head and Neck Surgery, Government Medical College, Srinagar over a period of 18 months from April 2015 to September 2016.

Exclusion Criteria for Study Group

- Patients aged <6 and > 15 years.
- Patients with acute rhinosinusitis.
- Patients with immunocompromised state.
- Patients with sino-nasal malignancies.
- Patients with previous history of nasal surgeries.

Done in patients of chronic rhinosinusitis with nasal polyposis.

5. Statistical Analysis

Statistical software SPSS Version 20.0 and Microsoft Excel were used to carry out statistical analysis of the data. Continuous variables were expressed as mean±SD and categorical variables as percentage. A p value of < 0.05 was considered as statistically significant

6. Results

In our study, as shown in figure 1, maximum 10 [40%] patients were in age group 14-15 followed by 6 [24%] patients in age group 10-11, 4 [16%] patients in age group 12-13, 3 [12%] patients in age group 8-9 and 2 [8%] patients in age group 6-7. The youngest patient was 6 years old.

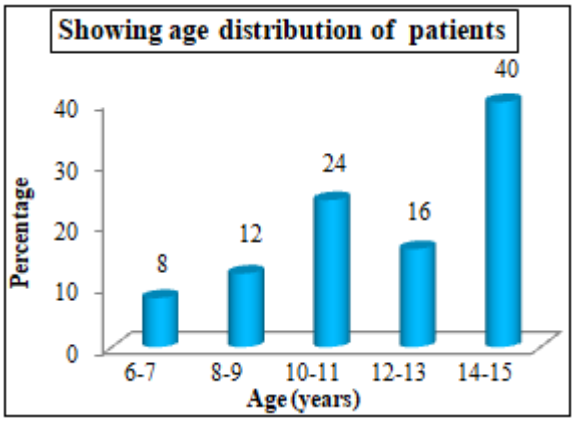

Figure 1

As shown in figure 2, there were 13[52%] female patients and 12[48%] male patients with Male : Female ratio as 0.9:1 Among males maximum 4 [33.2%] patients were in age group 14-15 followed by 3 [25%] patients each in age groups of 8-9 and 10-11 years and 1 [8.3%] patient each in age groups of 6-7 and 12-13 years. Among females maximum 6 [49.8] patients were in age group 14-15 followed by 3 [24.9%] patients each in age groups of 12-13 and 10-11 years and 1 [7.7%] patient in age group of 6-7 years.

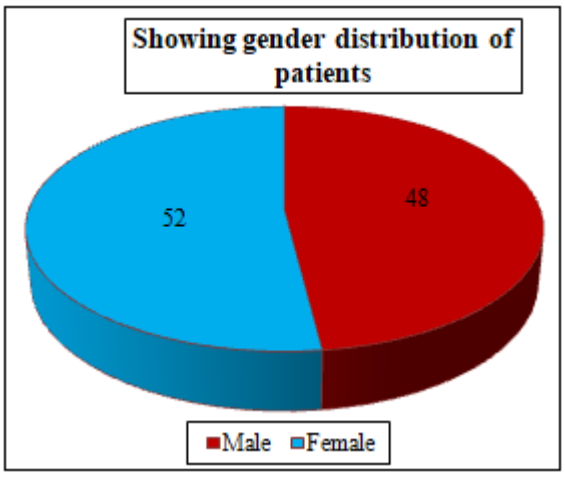

Figure 2

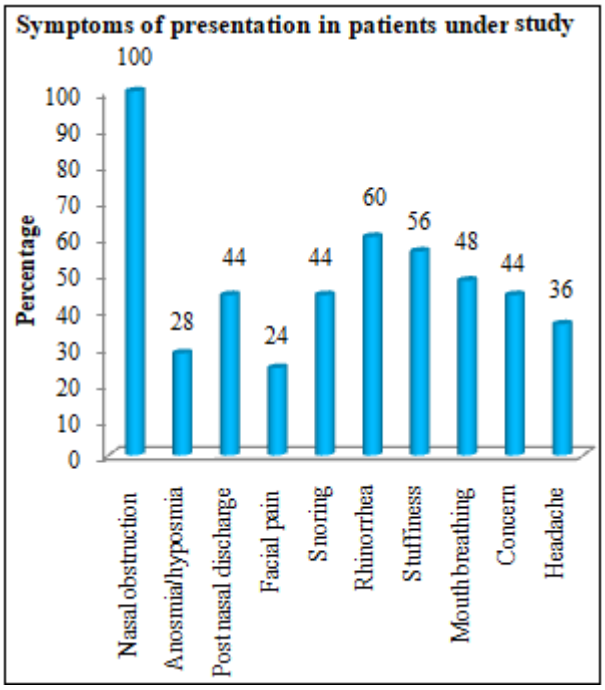

Figure 3

Figure 3 showing pre op complaints like nasal obstruction, rhinnorhea, facial pain, hyposmia, post nasal discharge. Nasal obstruction was complained by all 25 patients and it was very severe in 20 [80%] patients. Hyposmia was complained by 7 [28%] patients and it was very severe in 4 [57.1%] patients. Rhinnorhea was complained by 15 [60%] patients and it was very severe in 3 [20%] patients. Facial pain was complained by 6 patients and it was very severe in 3 [50%] patients. Post nasal discharge was complained by 11 [44%] patients which was very severe in 3 [27%] patients.

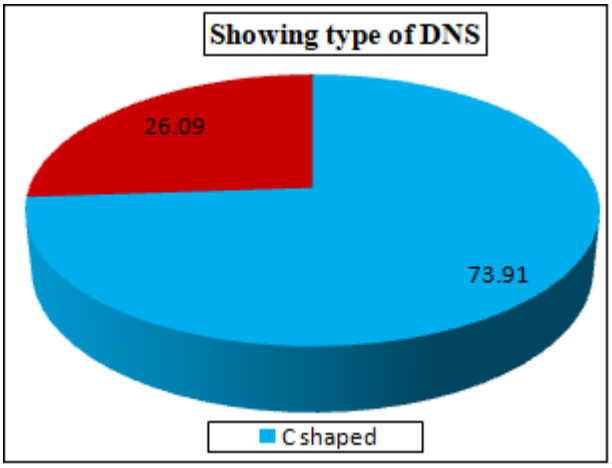

Figure 4

Above figure 4 showing 23 [92%] patients out of 25 patients had symptomatic DNS. C shaped DNS was observed in 17 [73.91%] patients while as S Shaped DNS was observed in 6 [26.09%] patients only.

In this study Chronic RhinoSinusitis [CRS] with nasal polyposis was seen in 7 [53.85%] patients and Chronic RhinoSinusitis without nasal polyposis was seen in 6 [46.15%] patients as illustrated by figure 5.

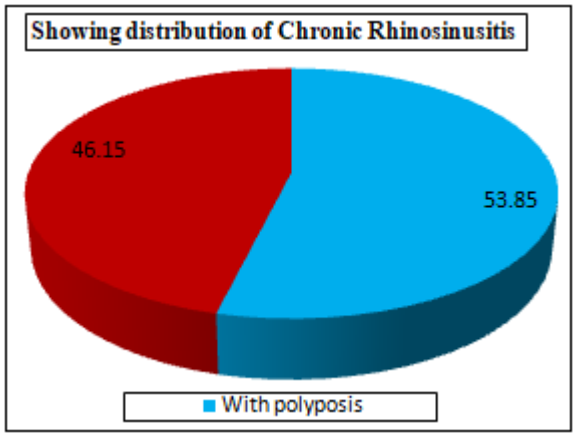

Figure 5

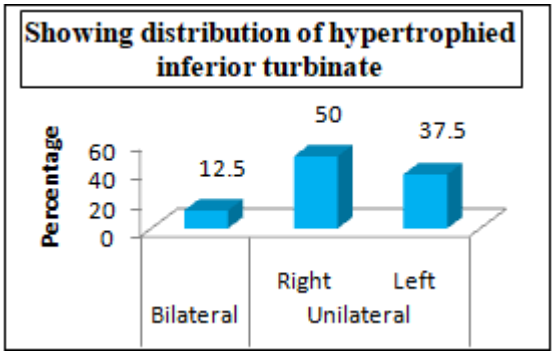

Figure 6

Figure 6 showing that among 25 patients, 8 [33%] patients had hypertrophied inferior turbinate. It was hypertrophied on right side in 4 [50%] patients and on left side in 3 [37.5%] patients. Bilateral hypertrophy of inferior turbinate was seen in 1 [12.5%] patient.

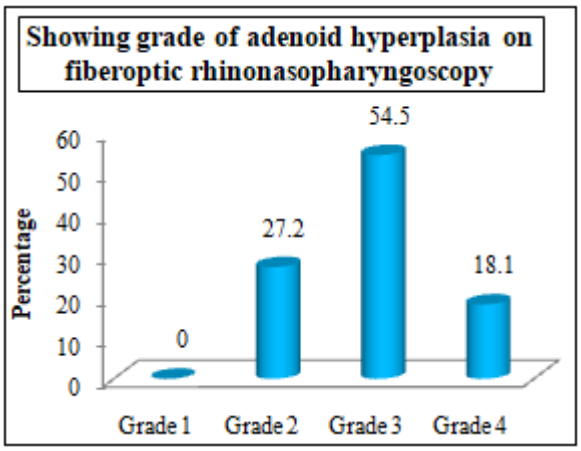

Figure 7 depicts Fiberoptic Rhinonasopharyngoscopy ;grade 3 adenoids were seen in 6 [54.5%] patients, grade 2 adenoids were seen in 3 [27.2%] patients and grade 4 adenoids were seen in 2 [18.15%] patients [Climens et al classification].

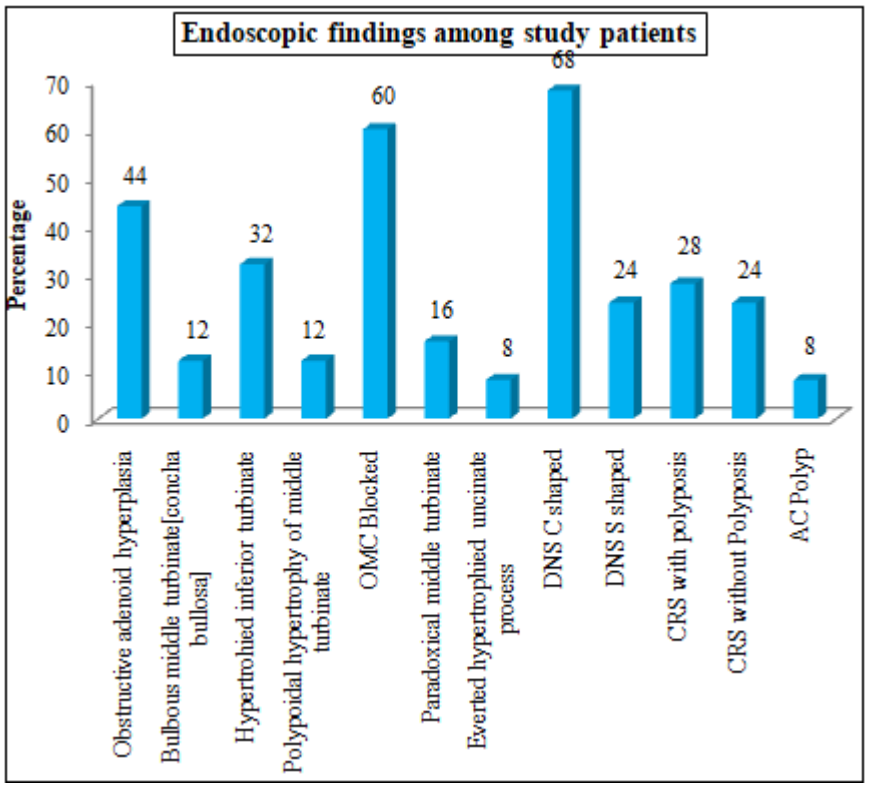

Figure 8

In this study at operation nasal endoscopy using 0^{o} (2.7mm) endoscope revealed obstructive adenoid hyperplasia in 11 (44%) patients, bulbous middle turbinate in 3 (12%) patients, paradoxical middle turbinate in 4 (16%) patients, polypoidal hypertrophy of middle turbinate in 3 (12%) patients, everted hypertrophied uncinate in 2(8%) patients. Osteomeatal complex was blocked in 15 (60%) patients, chronic rhinosinusitis with bilateral polyposis was present in 7 (28%) patients, antrochonal polyp was observed in 2 (8%) patients. Purulent nasal discharge was seen in 15 (60%) patients. DNS was observed in (92%) patients and hypertrophied inferior turbinate was present in 8 (32%) patients. This data is shown in figure 8.

7. Discussion

Nasal obstruction in the pediatric age group is posing a great challenge to the clinicians and with the advent of nasal endoscopes the management of nasal obstruction in pediatric age group has got revolutionized.In our study, maximum 10 (40%) patients were in age group 14-15 years followed by 6 (24%) patients in age group 10-11 years, 4 (16%) patients in age group 12-13 years, 3 (12%) patients in age group 8-9 years and 2 (8%) patients in age group 6-7 years. The youngest patient was 6 years old. In a similar study done by **Rande H Lazar et al (1986)**[7], the age range of children was 14 months to 16 years. **"Col David S. Parsons" and Capt Scott E. Phillips (1993)**[8] treated patients with FESS whose age range was 7 months to 17 years**. Ignazio Tasca, Giacomo Ceroni (2009)**[9] in a similar study operated children in age group of 5-12 years. **Michael Joseph C. David., Gil M. Vicente, Antonio H. Chua (2009)**[10] conducted a similar study and patients they operated were aged from 7-17 years. In our study, there were 13 (52%) female patients and 12 (48%) male patients with Male: Female ratio as 0.9:1**.**

23 (92%) out of 25 patients in our study had DNS.. A study done **by Kate Sarika et al (2015)**[11] noted DNS in 64.66% patients.

In this study, Chronic Rhino Sinusitis with nasal polyposis was seen in 7 (53.85%) patients and Chronic Rhinosinusitis without nasal polyposis was seen in 6 (46.15%) patients.

On fiberoptic rhinonasopharyngoscopy, grade 3 adenoids were seen in 6 (54.5%) patients, grade 2 adenoids were seen in 3 (27.2%) patients, and grade 4 adenoids were seen in 2 (18.15%) patients using Climens et al classification**..**

In our study, nasal obstruction was most common presenting symptom presenting in all the 25 (100%) patients. The second most common presenting symptom was rhinorrhea in 15 (60%) patients, followed by stuffy nose in 14 (56%) patients. 12 (48%) patients were mouth breathers. Snoring and post nasal discharge was complained by 11 (44%) patients each. Hyposmia was complained by 7 (28%) patients and facial pain by 6 (24%) patients.

8. Summary

In our study, maximum 10 [40%] patients were in age group 14-15 followed by 6 [24%] patients in age group 10-11, 4 [16%] patients in age group 12-13, 3 [12%] patients in age group 8-9 and 2 [8%] patients in age group 6-7. The youngest patient was 6 years old. There were 13[52%] female patients and 12[48%] male patients with Male : Female ratio as 0.9:1 nasal obstruction was the most common presenting symptom recorded in all 25 (100%)

patients. The second most common presenting symptom was rhinorrhea in 15 (60%) patients followed by stuffy nose in 14 (56%) patients. 12 (48%) patients were mouth breathers. Snoring and post nasal discharge was complained by 11 (44%) patients each. Hyposmia was complained by 7 (28%) patients and facial pain by 6 (24%) patients.

Further on anterior rhinoscopy and fiberoptic rhinonaso-pharyngoscopy findings recorded included C shaped DNS in 11 [44%] patients, S shaped DNS in 6 [24%] patients, hypertrophied inferior turbinate in 8 [24%] patients which was unilateral in 7 [24%] patients and bilateral in 1 [4%] patient, bilateral nasal polyposis in 7 [24%] patients, AC polyp in 2 [8%] patients, bulbous middle turbinate in 3 [12%] patients, purulent nasal discharge in 15 [60%] patients, paradoxical middle turbinate in 3 [12%] patients and everted hypertrophied uncinate process in 2 [8%] patients.

Nasal endoscopy using 0^o (2.7mm) endoscope revealed obstructive adenoid hyperplasia in 11 (44%) patients, bulbous middle turbinate in 3 (12%) patients, paradoxical middle turbinate in 4 (16%) patients, polypoidal hypertrophy of middle turbinate in 3 (12%) patients, everted hypertrophied uncinate in 2(8%) patients. Osteomeatal complex was blocked in 15 (60%) patients, chronic rhinosinusitis with bilateral polyposis was present in 7 (28%) patients, antrochonal polyp was observed in 2 (8%) patients. Purulent nasal discharge was seen in 15 (60%) patients. DNS was observed in (92%)patients and hypertrophied inferior turbinate was present in 8 (32%) patients.

In this study cystic fibrosis was ruled out in 9 [36%] patients having Chronic RhinoSinusitis [CRS] with nasal polyposis and AC Polyp. Mutational analysis was done in which delta F 508 mutation was seen in none of the 9 [36%] patients. Chloride iontophoresis was done in 9 [36%] patients which was negative in all the patients

9. Conclusion

The results of our study suggest that endoscopic evaluation of persistent nasal obstruction in children, despite the reservations expressed by many clinicians, is effective .Different causes of nasal obstruction were evaluated with a higher degree of confidence as endoscopy permitted the exact visualization of sinonasal anatomy. Endoscopy also enabled us to address more than one pathology at time. The results of our study also suggest that there was an excellent comparison between the symptoms at presentation and Endoscopic findings.

10. Future Directions

Endoscopic evaluation may become an integral part of evaluation of nasal obstruction in school going age group as it the best method of diagnosing the etiological factors.

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Author Profile

Dr Omar Mohammad Shafi MBBS MS Currently working as Senior Resident ,Post graduate Department of Otorhinolaryngology & Head and neck surgery, Government Medical College , Srinagar, Jammu and Kashmir , India .Correspondance Address; E8 Effandibagh, Rawalpora , Bypass, Sanatnagar, Srinagar .PIN 190005

Dr Zubair Ahmad Lone(MBBS, MS) Junior Resident ,Post graduate Department of Otorhinolaryngology & Head and neck surgery, Government Medical College , Srinagar, Jammu and Kashmir , India

Dr Qurat Ul Ain Batool (MBBS)Junior Resident ,Post graduate Department of Otorhinolaryngology & Head and neck surgery, Government Medical College , Srinagar, Jammu and Kashmir , India.

Prof Sajad Majid Qazi (mbbs , MS) is Professor and Head of unit 2.Post graduate Department of Otorhinolaryngology & Head and neck surgery, Government Medical College , Srinagar, Jammu and Kashmir , India