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Original Research Article

Adenoidectomy versus mometasone furoate nasal spray in treatment of nasal obstruction in children due to adenoid hypertrophy: a comparative study

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ABSTRACT

Background: One of the common causes for nasal obstruction in children is adenoid hypertrophy. It is common indication for surgical removal in these patients due to multiple morbidities. In severe symptoms adenoidectomy is recommended, however there are limitations for surgery like cleft palate. The safety of nasal steroid spray has been well reported. The aim of the current study is to determine the effectiveness of adenoidectomy verses mometasone nasal spray in treatment of children with adenoid hypertrophy.
Methods: Randomized prospective study was conducted in the department of ENT on 60 children who met the inclusion criteria. They were randomized into 2 groups and pre-treatment scoring was accessed. Group A underwent adenoidectomy and Group B underwent mometasonefuroate nasal spray therapy. Patients were evaluated on 40th day, 4th month.
Results: During the 40th day follow up post treatment, a significant difference was found with no nasal obstruction in 93.3% patients who underwent adenoidectomy compared to 63.3% for those treated with MF nasal. At follow up after 4 months, 93.3% patients in group A had had improvement in clinically as compared to 76.6% in group B were nasal obstruction was relived. In group A, there was significant reduction in adenoid grading after adenoidectomy compared to MF nasal spray at 40 days follow up ($p \leq 0.001$). However long term MF nasal spray also associated with significant reduction in the size.
Conclusions: In patients were adenoidectomy is contraindicated, long term MF nasal spray treatment has good efficacy in treatment of nasal obstruction due to adenoid hypertrophy.

Keywords: Adenoid hypertrophy, Adenoidectomy, Mometasonefuroate nasal spray, Nasal obstruction

INTRODUCTION

One of the common causes for nasal obstruction in children is adenoid hypertrophy.[1] It is common indication for surgical removal in these patients due to multiple morbidities. They are in smallest size at birth and start growing in size after immunologic development (at age 1-2- years).[2] Adenoids are exposed to multiple antigens in the respiratory air and they produce antibody against these antigens. This describes their enlargement after exposure to antigen especially in allergic patients.[2]

Hypertrophy of the adenoids can lead to repeated infections such as otitis media, sinusitis, mastoiditis, recurrent tonsillitis. Nasal obstructions lead to mouth breathing, snoring, nasal speech, halitosis, obstructive sleep apnea and olfactory disorders.[3-5]

In severe symptoms adenoidectomy is recommended, however there are limitations for surgery like cleft palate.[6] As infections could be a stimulant of adenoid enlargement, medical management of adenoid hypertrophy is presently directed towards harbored infections. The role of oral steroid in alleviating the symptoms due to adenoid hypertrophy is controversial. Systemic steroids produce temporary decrease in size but significant adverse effects. The safety of nasal steroid spray has been well reported.[8-10] No significant effects were seen on adrenocortical function in children's 6-12 years with allergic rhinitis.[8] Also intranasal administration of 200 mcg mometasonefuroate aqueous nasal spray once daily for 14 days was found to be safe and well tolerated in children 3-12 years of age.[9] The aim of the study was to access the short term and long term effects of MF nasal spray in treating adenoid hypertrophy and to compare it with adenoidectomy..

METHODS

This study was conducted in department of ENT, AJ institute of medical sciences, Mangalore between august 2017 to October 2018. 60 children aged between 3-11 years came to ENT department with predominant symptoms of nasal obstruction and confirmed to have adenoid hypertrophy were considered. A prospective randomized comparative study was done. Children who fit the inclusion and exclusion criteria were divided into 2 groups, group A patients underwent adenoidectomy and group B patients were treated with mometasone nasal spray (100 mcg) for 40 days followed by maintenance dose for 3 months. Initial assessment was done by taking detailed history and physical examination and pretreatment and follow up symptom scores at visit 1(at 40 days) and visit 2 (4 months) were assessed. Diagnostic nasal endoscopy done on pretreatment and follow up visits and adenoid hypertrophy grading was determined (Figure 1). Final readings were analysed to determine the efficacy of mometasone nasal spray as an alternative to surgery.

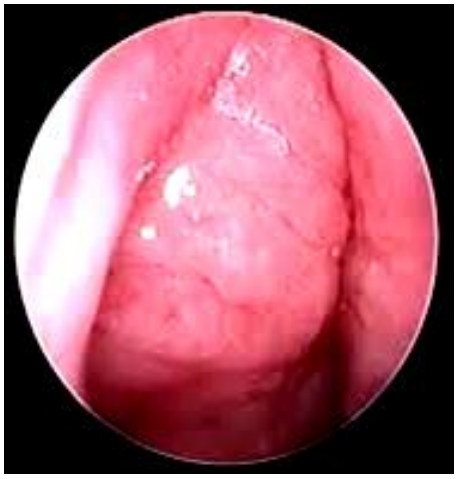

Figure 1: Diagnostic nasal endoscopy for adenoid hypertrophy grading.

Inclusion criteria

Inclusion criteria were history of nasal obstruction/ snoring for more than 3 months; adenoid hypertrophy confirmed with endoscopic or x ray findings (Figure 2); Group A inclusion criteria includes:

- Voluntarily requiring surgery
- Recurrent adenotonsillitis
- Complications such as otitis media with effusion
- Contraindications to nasal spray or for steroids.

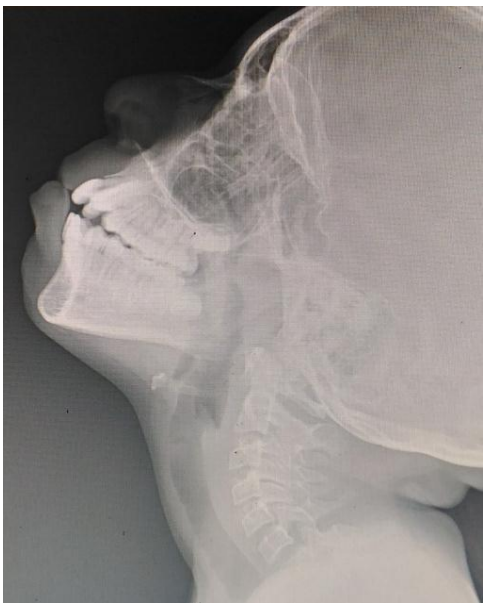

Figure 2: X ray nasopharynx showing adenoid hypertrophy.

Exclusion criteria

Exclusion criteria were presence of symptoms of acute respiratory tract infection within 4 weeks of study; use of nasal or systemic or inhaled corticosteroids or antibiotics within 4 weeks prior to study; prior tonsil or adenoid surgery; nasal anatomic anomalies (e.g., nasal septum deviation); sinonasal diseases such as hypertrophy of inferior turbinate and nasal polyposis; craniofacial malformations like cleft lips / cleft palate; history of epistaxis or hypersensitivity to steroids.

Statistical analysis

Data analysis was carried out using statistical package for social science (SPSS, V 10.5) software. In all cases "p" value of less than 0.05 was indicative of statistical significance.

RESULTS

There were 48.3% male and 51.7% female (Table 1) with mean age group of 6.7±1.84 in group A and 6.37±2.10 in group B (Table 2).

Table 1: Sex distribution.

	Gender		Total (%)	χ2 value (chi square)	P value
	Male (%)	Female (%)			
Group A	14 (46.70)	16 (53.30)	30 (100)	0.067	0.796
Group B	15 (50)	15 (50)	30 (100)		
Total	29 (48.30)	31 (51.70)	60 (100)		

Table 2: Mean age group.

	N	Mean age	SD	Min.	Max.	't' value	P value (student 't'test)
Group A	30	6.7	1.841	4	11	0.425	0.517
Group B	30	6.37	2.109	3	11		

SD – standard deviation.

Table 3: Assesment of severity of nasal obstruction.

Visit		Nasal obstruction - severity				Total (%)	χ2 value (chi square)	P value
		Absent (%)	Mild (%)	Moderate (%)	Severe (%)			
Pre treatment	Group A	1 (3.33)	8 (26.70)	12 (40)	9 (30)	30 (100)	1.404	0.848
	Group B	2 (6.70)	7 (23.30)	14 (46.70)	7 (23.30)	30 (100)		
40th day	Group A	28 (93.30)	2 (6.70)	0 (0)	0 (0)	30 (100)	7.954	0.005
	Group B	19 (63.30)	11 (36.70)	0 (0)	0 (0)	30 (100)		
4th month	Group A	28 (93.30)	1 (3.30)	1 (3.30)	0 (0)	30 (100)	3.49	0.174
	Group B	23 (76.70)	5 (16.70)	2 (6.70)	0 (0)	30 (100)		

Table 4: Adenoid size grading.

Visit		Adenoid grading				Total (%)	χ2 value (chi square)	P value
		1 N (%)	2 N (%)	3 N (%)	4 N (%)			
Pretreatment	Group A	0 (0)	4 (13.30)	13 (43.30)	13 (43.30)	30 (100)	7.221	0.386
	Group B	0 (0)	6 (20)	16 (53.30)	8 (26.70)	30 (100)		
40th day	Group A	28 (93.30)	2 (6.70)	0 (0)	0 (0)	30 (100)	45.764	<0.001
	Group B	2 (6.70)	11 (36.70)	17 (56.70)	0 (0)	30 (100)		
4th month	Group A	28 (93.30)	2 (6.70)	0 (0)	0 (0)	30 (100)	41.961	<0.001
	Group B	3 (10)	18 (60)	9 (30)	0 (0)	30 (100)		

In group A, pre-treatment 9 (30%) had severe nasal obstruction, 12 (40%) had moderate, 8 (26.7%) had mild and 1 (3.3%) had no nasal obstruction. In group B, pre-treatment 7 (23.3%) had severe nasal obstruction, 14 (46.7%) moderate, 7 (23.3%) mild and 2 (6.7%) with no nasal obstruction. During the 40th day follow up post treatment, a significant difference was found with no nasal obstruction in 93.3% patients who underwent adenoidectomy compared to 63.3% for those treated with MF nasal. The overall decrease severity of nasal obstruction was significant in adenoidectomy versus MF nasal spray (p=0.005). At follow up after 4 months, 93.3% patients in group A had had improvement in clinically as compared to 76.6% in group B were nasal obstruction was relived. The overall decrease was not statistically significant between group A compared to group B (p=0.192) (Table 3).

In group A, there was significant reduction in adenoid hypertrophy grading after adenoidectomy compared to MF nasal spray at 40 days follow up (p=<0.001). 4 month follow up there was statistically significant difference in group A as compared to group B (p=<0.001). Long term MF nasal spray was associated with significant reduction in adenoid hypertrophy but it was not as effective as adenoidectomy (Table 4).

DISCUSSION

Adenoid hypertrophy is one of the most common pathologic condition in paediatric age group. They present with bilateral nasal obstruction, which may be associated with snoring, mouth breathing and obstructive sleep apnea. The treatment for most of children with uncomplicated adenoid hypertrophy is by adenoidectomy but significant risks are present and complications can

occur with the surgery are well known. Paulussen et al hypothized that the removal of adenoid lymphatic tissue could have a negative impact on systemic immunologic system.[10]

Demain and Goetz described the first successful use of intranasal steroid for adenoid hypertrophy in 1995.[11] Since then, other authors have similar encouraging results with different intranasal steroid preparations. The proposed mechanism of action is by direct reduction of adenoid size by lympholytic action of steroid and reduction in adenoidal and nasopharyngeal inflammation by anti-inflammatory effects of steroids.[11] Intranasal steroid preparations are also found to be safe in paediatric age group with no systemic side effects.

A study done by Gupta et al on snoring due to adenoids showed a significant improvement in all domains of obstructive sleep apnea due to adenoid hypertrophy.[12] these findings are similar to our study. In another study done by Rezende et al. Mometasone nasal spray had a significant improvement in nasal obstruction as compared to saline nasal spray. Also there was a significant reduction in adenoid area as compared to saline nasal douching which had no effect on the adenoid size.[13] These findings are similar to our study which showed a decrease in nasal obstruction and decrease in the size of adenoids.

CONCLUSION

Long term topical intranasal mometasone nasal spray can be a good therapeutic option to decrease adenoid hypertrophy and nasal obstruction without the need for surgery. This study provides an effective alternative to surgical treatment in children with adenoid hypertrophy. Intranasal corticosteroids are generally well tolerated in children. In this study no side effects were observed after a total dose of 100 micrograms /day was used for 40 days daily, followed by maintenance therapy. Hence long term use of mometasonenasal spray can be an effective alternative for patients not willing for surgery.

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