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**The Effect of Beclomethasone Nasal Spray on the Size of Adenoid and its Related Obstructive Symptoms in Children with Adenoid Hypertrophy.**

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**Abstract:**

**Background:** Adenoid hypertrophy is associated with high morbidity rate in children. Although surgical treatment is indicated in severe cases, however, there are evidences that some medical interventions are effective in improvement. This study was conducted to evaluate the effectiveness of beclomethasone nasal spray on reduction of airway obstruction due to adenoid hypertrophy.

**Methods:** In a clinical trial study 31 children between the ages of 3-13 years suffering from excessive adenoid hypertrophy were administered beclomethasone nasal spray (2 puffs each 12 hr) for duration of 8-week.

All subjects were evaluated for adenoid size and grade of airway obstruction before and after the intervention by lateral neck radiography.

A questionnaire was filled in by subjects' parents to assess obstructive symptoms before and after the intervention.

**Results:** Radiographic findings revealed that after treatment adenoid size was significantly less than its size before treatment and airway diameter was significantly more than before treatment.

Also finding showed that severe and moderate forms of nasal obstructive findings after intervention were significantly less frequent than before it.

**Conclusion:** According to our research, topical nasal beclomethasone can lead to decrease the size of the adenoid and the severity of upper airway obstructive signs and symptoms, as well as eliminating the daily somnolence of children with adenoid hypertrophy.

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**Keywords:** Adenoid hypertrophy, Beclomethasone, Nasal spray, Airway obstruction

### Introduction:

Adenoid hypertrophy is associated with high morbidity rate in children. Surgery treatment is indicated in severe forms. However there are some limitations for surgery as the main route of therapy, e.g. in cleft palate adenoidectomy may lead to velopharyngeal insufficiency or in bleeding tendency there is risk of hemorrhage after surgery. In such instances surgical procedure could be replaced by non surgical methods. Some professionals recommend antibiotic therapy to decrease adenoid size.<sup>(1)</sup> Now a day the most current medical therapy to decrease obstructive symptoms due to adenoid hypertrophy and the size of the adenoid pad is administering topical steroids.<sup>(2, 3, 4, and 5)</sup> In this study, we investigated whether beclomethasone nasal spray could result in 1) improvement of lateral neck radiographic findings related to adenoid hypertrophy and 2) decreasing airway obstruction symptoms.

### Methods and Patients:

In a one group pretest-post test clinical trial study 31 children between 3-13 years old with adenoid hypertrophy were selected in a simple convenient method among children who referred to ENT clinics of Alzahra hospital and Kashani hospital affiliated to Isfahan University of Medical sciences due to symptoms of nasal airway obstruction and they were followed for a duration of 8 weeks. Beclomethasone nasal spray two puff two times daily prescribed for all patients for treatment.

All subjects were evaluated for adenoid size and grade of airway obstruction before and after the intervention by lateral neck radiography. A questionnaire including a numerical grading scale for nasal obstructive symptoms (such as hyponasal speech, day time sleepiness, nasal stuffiness, snoring and enuresis) were filled in by subjects' parents. The numerical grading scale had been designed as: none, mild, moderate and severe for each symptom. Exclusion criteria were upper respiratory infection, allergic rhinitis, antibiotic use and not interesting to participate in the survey. Also children administered oral corticosteroids were excluded. Descriptive analytic methods (Wilcoxon Ranks Test and distribution frequency) were used for data analysis through SPSS (Version 11). P value < 0.05 was consider significant.

### Results:

31 children took part in the study. The mean age of the subjects was 7.25 ± 2.19 years, %41.94 of patients were male and %58.06 of them female. The chief complaints of the patients at the time of refer were night snoring (51.61%,n=16), mouth breathing (%16.13,n=5), conductive hearing Loss (%12.9,n=4), nasal stuffiness (%9.68,n=3) and recurrent upper respiratory infections (%9.68,n=3). Radiographic findings revealed that adenoid size (antero-posterior diameter) after treatment was significantly less than its size before treatment and adenoid – soft palate space (airway diameter) after treatment was significantly more than

before treatment (figures 1 and 2). In regarding to symptoms related to nasal obstructive findings showed that after intervention severe and moderate forms of hyponasal speech, day time sleepiness, nasal stuffiness, and night snoring were significantly less frequent than before intervention (table 1).

Also it was determined that the frequency of patients who suffered from enuresis before treatment significantly decreased after intervention (4 patients versus 1 patient).

Fig 1: Frequency of patients related to airway diameter

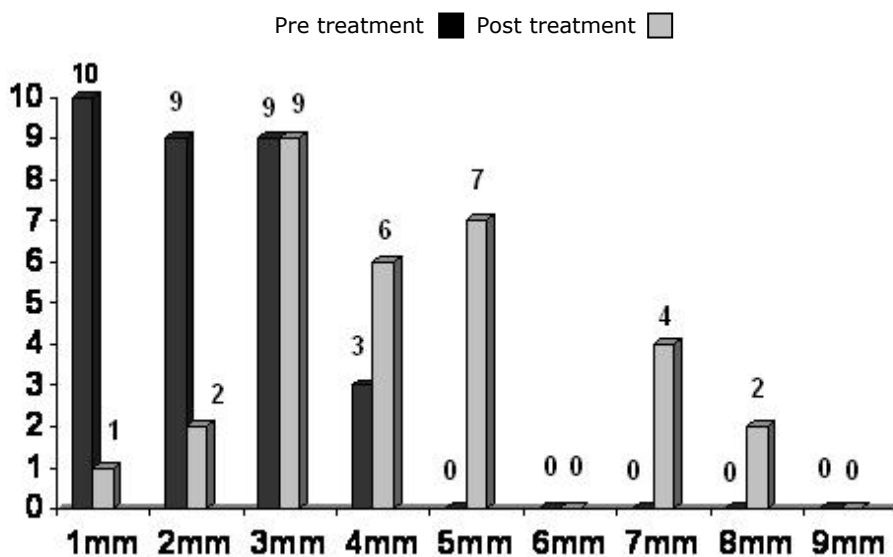


Fig 2: Frequency of patients related to adenoid size

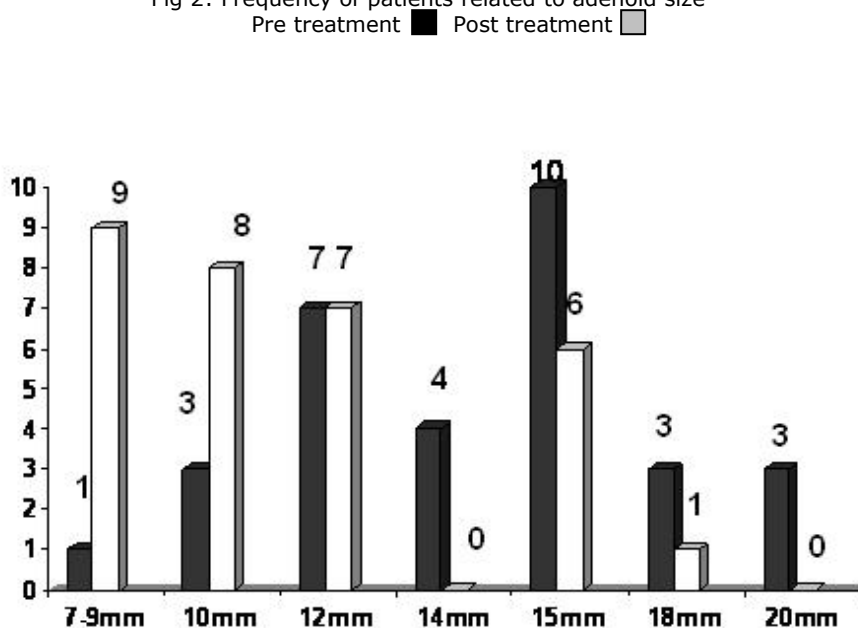


Table 1: frequency of symptoms related to air way obstruction in patients before and after treatment

Severity Symptoms		Severe	Moderate	Mild	Absence
Hyponasal speech	Before	5	19	7	0
	After	0	9	10	12
Uncomperable sleep	Before	2	15	14	0
	After	0	4	13	14
Daytime sleepiness	Before	4	10	8	9
	After	0	0	11	20
Nasal sleepiness	Before	8	17	5	1
	After	0	3	13	15
Nasal snoring	Before	6	23	2	0
	After	0	3	16	12

**Discussion:**

In 1995, Demain and Goetz reported that 2 puffs of beclomethasone nasal spray BID (336 µg/day) is able to decrease the adenoid volumes which in turn leads to decrease the intensity of nasal obstruction.

For grading the amount of obstruction, they used the proportion of adenoid mass to choanal size during fiberoptic rhinoscopy and for assessment of obstructive symptoms, a numerical clinical grading scale was used.<sup>(2)</sup>

In 2001 Brouillette et al. used polysomnography for measuring night disturbance due to air way obstruction and revealed that, topical fluticasone lead to decrease in apnea-hypoapnea indices, but in contrast to our study there were no change in neither the size of adenoid tissue nor the intensity of the symptoms.<sup>(3)</sup>

Gaetano, Stefania and their colleagues' study indicated that inhalation of beclomethose nasal spray (400 µg/day) for a duration of 2 weeks may decrease the severity of respiratory obstructive symptoms in some patients. These patients were followed 100 weeks. Results

showed a significant decrease in the rate of adenotonsilectomy, in subjects who had received low dose corticosteroid (200 µg/day) at least 24 weeks.<sup>(4)</sup> At the present study we did not follow our patients for a long duration, so we can not have any suggestion about the efficacy of the intervention on rate of adenoidectomy.

Cengel et al. in 2006 also declared the effect of mumethosone furoat on adenoid shrinkage and relieving the obstructive symptoms.

They used adenoid to choanal size ratio to evaluate the adenoidal size and a clinical numerical scale to evaluate the severity of symptoms. Finally they concluded that, both adenoid size and severity of symptoms have decreased significantly after treatment. According to the results, they presented the topical steroid therapy (even with a temporary effect), as an alternate method of therapy for surgery in children with upper respiratory tract obstruction due to adenoid hypertrophy.<sup>(5)</sup>

According to Barnes<sup>(6)</sup> and Mabry<sup>(7)</sup> low dose (400 µg/day) beclomethasone nasal spray has been proved to be safe meanwhile, Skoner and colleagues reported

the negative effect of long term use of beclomethasone on the final stature of the patients, after a one year period of drug usage. He mentioned that, this undesirable drug effect begins one month after drug consumption, however, hypothalamic – hypophysis – adreno - cortical axis evaluation revealed no abnormality. In this assay, effects of the drug on the final growth have not been followed. They also recommend that, the benefits of the topical nasal steroid versus its complications (especially when declining dosage during treatment) should be considered.<sup>(8)</sup>

In the present study we had limitation to follow our patients for a long period, thus we can not have any suggestion about the effect of nasal beclomethasone on the growth of children.

#### **Conclusion:**

According to our research, topical nasal beclomethasone can lead to decrease the size of the adenoid and the severity of upper airway obstructive signs and symptoms, as well as eliminating the daily somnolence of children with adenoid hypertrophy.

#### **Acknowledgement:**

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