Adenoid Hypertrophy in Adults: A case Series

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Abstract Adenoid hypertrophy is common in children. Size of the adenoid increases up to the age of 6 years, then slowly atrophies and completely disappears at the age of 16 years. Adenoid hypertrophy in adults is rare. Present study shows that adenoid hypertrophy is now increasing in adults because of various causes. Study has been conducted in the Department of ENT and Head & Neck Surgery, Alluri Sitarama Raju Academy of Medical science, Eluru, Andhra Pradesh, India. Study shows that incidence of adenoid hypertrophy is increasing as the cause of nasal obstruction in adults. This study identified the different causes of adenoid hypertrophy in adult patients. The common causes of adenoid hypertrophy in adults are chronic infection and allergy. Pollution and smoking are also important predisposing factors. Sometimes it is also associated with sinonasal malignancy, lymphoma and HIV infection. Study shows that 21 % of adult nasal obstruction is due to adenoid hypertrophy. But in case of the patient with chronic tonsillitis only 9 % were associated with adenoid hypertrophy. Males are more commonly involved (70 %) then female, may be because of outdoor activities and more commonly exposed to pollutants. And most commonly involved age group is 16–25 years (60 %). Majority of the cases with adenoid hypertrophy are associated with infection and allergy i.e. descending infection in 33.3 % cases, ascending infection in 20 % cases and allergic rhinitis in 30 % cases. Association of malignant sinonasal tumors, non Hodgkin's lymphoma and HIV infections are rare i.e. 3.3 % each. So any cases of adult

adenoid hypertrophy should be treated seriously to exclude the dangerous causes.

Keywords Waldeyer's Ring · Tonsillectomy · Adenoidectomy · Rhinoscopy

Introduction

Adenoid is the condensation of lymphoid tissue at the back of nose or on the posterosuperior wall of nasopharynx. Adenoid is the part of Waldeyer's Ring. It appears to have an important role in the development of an 'immunological memory' in younger children [1]. Adenoids hypertrophy occurs physiologically in children between the age of 6–10 years, then atrophy at the age of 16 years [2].

Adenoid enlargement is uncommon in adults and because examination of the nasopharynx by indirect posterior rhinoscopy is inadequate, many cases of enlarged adenoid in adults are misdiagnosed and accordingly maltreated [3]. Presence of lymphoid hyperplasia in the adult nasopharynx, including the persistence of childhood adenoids is associated with chronic inflammation. Regressed adenoidal tissue may re-proliferate in response to infections and irritants.

Adenoid Hypertrophy in adults may be due to compromised immunity, especially those receiving organ transplants and those having human immunodeficiency virus (HIV) infection.

Enlarged adenoids can become nearly the size of a ping pong ball and completely block airflow through the nasal passages. Even if enlarged adenoids are not substantial enough to physically block the back of the nose, they can obstruct airflow enough so that breathing through the nose requires an uncomfortable amount of work and occurs

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through an open mouth. Adenoids can also obstruct the nasal airway enough to affect the voice without completely stopping nasal airflow.

Present study is a series of adult patients' age more than 16 years having enlarged adenoid mass in the nasopharynx, some are isolated and some associated with chronic tonsillitis. We have tried to find out the causes of the enlarged adenoid. Different symptomatology are reviewed. Here also we have given emphasis on the management of these atypical cases.

Materials and Methods

Study Design

This was a 2 years prospective study of 200 adult patients, all aged more than 16 years. Out of those, 100 patients having complaint of nasal obstruction were reviewed. Rest 100 patients planned for tonsillectomy were screened for adenoid enlargement.

Study Setting

This was a hospital based study conducted in the Department of ENT and Head & Neck Surgery, Alluri Sitarama Raju Academy of Medical science, Eluru, Andhra Pradesh, India.

Study Period

February 2010–January 2012

Sampling Criteria

All the adult patients aged more than 16 years with adenoid hypertrophy were taken into study. In this study 30 adult patients having adenoid hypertrophy were found out by screening 100 adult patients having nasal obstruction and 100 patients planned for tonsillectomy. These 30 patients were evaluated and studied.

Inclusion Criteria's

- (1) Patient giving consent for study on him or her.
- (2) Patient willing for all the required investigations
- (3) Patient coming for regular follow up
- (4) Age of the patient should be more than 16 years
- (5) Patients having enlarged adenoid on investigations

Exclusion Criteria's

- (1) Patient not giving consent for the study on him or her
- (2) Patient not coming for regular follow up

- (3) Pregnancy and breast feeding
- (4) Throat complaint not related to tonsillitis.

Procedure and Technique

First of all, the patients attending ENT out patient department were divided into two categories.

First category having patients complaining of nasal obstruction and it may be unilateral, bilateral, continuous or intermittent. History of those patient were taken thoroughly regarding other symptoms like sneezing, rhinorrhoea, itching of the nose, headache, fever, loss of smell, cough etc. Relevant past history and family history were also taken into consideration. This was followed by detail clinical examination including both general and local examination. Anterior rhinoscopy was useful to detect deviated nasal septum, septal spur, hypertrophic turbinates, nasal polyp, foreign body, rhinolith etc. Posterior rhinoscopy was possible only in few cases to examine the nasopharynx thoroughly. So most of the cases, it was not so much informative regarding adenoid hypertrophy and nasal obstruction. All the routine investigations were done including test for HIV infection. Investigations like X-ray PNS water's view, X-ray nasopharynx lateral view and nasal endoscopy were done routinely in all the cases. X-ray nasopharynx was obtained in an erect position with the neck extended and the mouth opened in order to visualize the shadow of the adenoid. The palatal airway was evaluated as described by Bitar [4]. The degree of nasopharyngeal obstruction was determined by assessing the ratio of adenoid shadow diameter to the nasopharyngeal diameter. Mild if <50 % of the palatal airway was obstructed, moderate if >50 % was obstructed but not up to 100 % and severe if there was complete nasopharyngeal obstruction and no air column was seen on the post nasal space. Some cases were reviewed with CT scan. CT scan gives much clearer picture of adenoid and nasopharyngeal space, but more important is the nature of the tumor such as extension and bone destruction, which implies a malignant tumour. More over CT scan is also useful to diagnose chronic sinusitis. If adenoid or adenoid like masses were found in the nasopharynx, then our next step was endoscope guided punch biopsy and sending the mass for histopathological study. In all the cases of adenoid enlargement, we were sending the throat swab for culture and sensitivity test and antibiotics were started accordingly. As well as all cases were tested for allergy by blood differential count of leucocytes, absolute eosinophil count, nasal smear for eosinophil and serum Ig E level.

And after conformation of mass, adenoidectomy were performed and the mass were again sent for histopathological study. In case of simple adenoid mass,

adenoidectomy was the treatment of choice and response was very good.

Second category of the patients was having symptoms like throat pain, dysphagia, foreign body sensation of throat, recurrent attacks of fever and throat pain. By proper history taking and thorough clinical examination these patients were diagnosed as chronic tonsillitis. Tonsillar enlargements were graded as per Brodsky grading method [5]. Grade 1+ means tonsils were completely in the tonsillar fossa and rarely seen behind the anterior pillars. Grade 2+ means tonsils were visible behind the anterior pillars. Grade 3+ means tonsils extended 3/4th of the way to midline. Grade 4+ means tonsils were touching each other and completely obstructing the airway. Then all the investigations mentioned in first category were performed to find out adenoids. Those patients having adenoid hypertrophy, both adenoidectomy and tonsillectomy were done and the adenoid masses were sent for histopathological study. Rest of the patients were undergone only tonsillectomy.

Now the patients of both the categories having adenoid enlargement were studied.

Results and Observation

In this study first category of patients having nasal obstruction were reviewed. Table 1 showed the causes of nasal obstruction in these patients. Out of 100 patients 60 were male and 40 were female. Most common pathology in this category was found to be deviated nasal septum and/or septal spur i.e. 45 cases and next common group was the adenoid hypertrophy i.e. 21 cases (male—15 and female—6). Other causes were inferior turbinate hypertrophy (14 cases), nasal polyp (6 cases), allergic rhinitis (11 cases), rhinolith (1 case), nasal tumor (1 case) and atrophic rhinitis (1 case). So prevalence of adenoid hypertrophy in nasal

Table 1 Causes of nasal obstruction ($n = 100$)

Sl. No.	Pathology	Male	Female	Total	%
1	DNS &/or Spur	25	20	45	45
2	ITH ^a	9	5	14	14
3	Nasal polyps	4	2	6	6
4	Rhinolith	1	0	1	1
5	Nasal tumour	1	0	1	1
6	Atrophic rhinitis	0	1	1	1
7	Allergic rhinitis	5	6	11	11
8	Adenoid hypertrophy	15	6	21	21
9	Total	60	40	100	100

^a Inferior turbinate hypertrophy

obstruction is 21 %. Those 21 patients of adenoid hypertrophy were taken from this category for study.

Table 2 showed the sex distribution of the patients diagnosed as chronic tonsillitis and planned for surgery. Out of 100 adult patients 91 patients were having only tonsillar enlargement without adenoid hypertrophy (male—51, female—40) and only 9 patients were having adenoid hypertrophy along with tonsillar enlargement (male—7, female—2). So prevalence of adenoid hypertrophy is 9 % in adult tonsillitis. Those 9 patients with adenotonsillitis were taken into study.

Out of above two categories total 30 adult patients were found to have adenoid hypertrophy and considered for study. Table 3 showed the age and sex distribution of the patients with adenoid hypertrophy. Out of 30 patients 21 were male and 9 were female. Most commonly involved age group was 16–25 years i.e. 18 patients (male—12, female—6), then 26–35 years i.e. 8 patients (male—6, female—2) and least common was from 36 to 45 years i.e. 4 patients (male—3, female—1). So it showed that males are more commonly involved than female.

As per habitat distribution 26 patients out of 30 were from urban areas and only 4 patients were from rural areas.

On observing the occupation of the patients it was found that majorities were working in the road side (10 patients), factories (8 patients) and doing agriculture (4 patients). This implies that pollution may be an important factor in development of adenoid hypertrophy. It also showed that persons working in AC office room are more prone to develop the disease in comparison to patient working in open office room. But this is not conclusive because of less sample size and further study is required for this.

Table 2 Sex distribution of patient with chronic tonsillitis and adenoiditis ($n = 100$)

Sl. No.	Pathology	Male	Female	Total	%
1	Only chronic tonsillitis	51	40	91	91
2	Chronic tonsillitis with adenoiditis	7	2	9	9
3	Total	58	42	100	100

Table 3 Age and sex distribution of the patients with adenoid hypertrophy ($n = 30$)

Sl. No.	Age group	Male	Female	Total	%
1	16–25	12	6	18	60
2	26–35	6	2	8	26.6
3	36–45	3	1	4	13.3
4	Total	21	9	30	100
5	Percentage	70	30	100	

By using above all diagnostic methods we had tried to identify the predisposing factors for adenoid hypertrophy in these 30 adult patients. Out of 21 male patients 10 members and out of 9 female patients 2 members are having the habits of smoking. Table 4

Table 5 showed the predisposing factors for adenoid hypertrophy in our series. Commonest factor here was the descending infections like chronic sinusitis, rhinitis and otitis media i.e. in 10 patients (male—7, female—3). Next common cause was allergic rhinitis i.e. in 9 patients (male—7, female—2). One more important cause was the ascending infection from tonsil, pharynx and teeth i.e. in 6 patients (male—3, female—3). Rare factors associated with adenoid hypertrophy in our series were nasal polyp and benign tumors (2 patients), non Hodgkin's lymphoma (1 male patient), malignant sinonasal tumour (1 male patient) and HIV infection was associated finding in one male case. Therefore common causes of adenoid hypertrophy in adult patients may be due to either chronic infection or allergy. Less commonly but more importantly it may be associated with the malignant diseases of nose and paranasal sinuses and sometimes lymphomas (see Fig. 1).

Fig. 1 Hypertrophied adenoid

Discussion

Adenoid is the condensation of lymphoid tissue at the back of nose or on the posterosuperior wall of nasopharynx. Santorini described the nasopharyngeal lymphoid aggregate or 'Lushka's tonsil' in 1724. Wilhelm coined the term adenoid to apply to what he described as 'nasopharyngeal vegetations' in 1870.

The adenoid, along with the tonsils at the back of the mouth and tonsillar tissue at the base of the tongue form a ring of tissue (Waldeyer's ring) that assists in preventing bacteria, viruses, and toxins from entering the body. The adenoid and the tonsillar tissues are largely composed of a group of blood cells termed B lymphocytes, which make antibody. This antibody binds bacteria, viruses, and other toxins and inactivates them, thus keeping them away from entering into the body and causing disease. Unlike the tonsils which can be seen by looking directly through the mouth, the adenoid is positioned at the backmost part of the nasal cavity and up behind the soft palate. The adenoid, like tonsillar tissue, can be involved with both acute and

Table 4 Occupation of the patients ($n = 30$)

Sl. No.	Occupation	No. of patients	%
1	Agriculture	4	13.4
2	Factories	8	26.7
3	Road side work	10	33.4
4	Student	1	3.3
5	AC office room ^a	5	16.6
6	Open office room	2	6.6
7	Total	30	100

^a Air conditioned

Table 5 Predisposing factors for adult adenoid hypertrophy ($n = 30$)

Sl. No.	Disease	Male	Female	Total	%
1	Descending infection like chronic sinusitis, rhinitis and otitis media	7	3	10	33.3
2	Allergic rhinitis	7	2	9	30
3	Ascending infection like chronic tonsillitis, pharyngitis and dental infection	3	3	6	20
4	Polyp and benign tumour	1	1	2	6.7
5	Malignant sinonasal tumour	1	0	1	3.3
6	Non Hodgkin's lymphoma	1	0	1	3.3
7	HIV infection	1	0	1	3.3
8	Total	21	9	30	100

chronic infections. With ongoing infection or inflammation, the adenoid can progressively enlarge. Since it sits at the backmost part of the nasal cavity, its main symptoms affect nasal function.

Adenoid appears to have an important role in the development of an ‘immunological memory’ in younger children. Removal of the adenoid at a young age may be immunologically undesirable [6] but there appears to be no decrease in IgE levels after adenoidectomy [7]. Adenoid hypertrophy, physiologically in children between the ages of 6 and 10 years, then atrophies at the age of 16 years [2]. Age related changes assessed by CT, MRI and positron emission scan (PET) also demonstrated a significant decrease in the size of adenoids with aging. Although adenoid tissue undergoes regression toward the adolescent period [8] but Adenoid hypertrophy is also seen in the normal adult population [9]. Adenoid enlargement is uncommon in adults and because examination of the nasopharynx by indirect posterior rhinoscopy is inadequate, many cases of enlarged adenoid in adults are misdiagnosed and accordingly maltreated [3].

Although the cause of adenoid hypertrophy is not exactly known but certain reasons have been proposed. Presence of lymphoid hyperplasia in the adult nasopharynx, including the persistence of childhood adenoids is associated with chronic inflammation [3]. Regressed adenoidal tissue may re-proliferate in response to infections and irritants [10]. Finkelstein et al. [11] reported the presence of obstructive adenoids in 30 % of heavy smokers but in another study percentage of smokers was not significantly higher than in males of the same age [12]. In our study 12 members were having history of smoking (10 male, 2 female).

In a study by Hamdan et al. [13] prevalence of adenoid hypertrophy in adults with nasal obstruction approached 63.6 % in patients with nasal obstruction and 55.1 in the control group ($p = 0.007$). In our study the prevalence of adenoid hypertrophy in patients with nasal obstruction is 21 %.

There are various clinical features associated with adenoid hypertrophy. All patients have nasal obstruction [3, 10] which may result in oral breathing, recurrent nasal infection and hypo nasal speech. Higher percentage of children with Adenoid Hypertrophy was reported to suffer from snoring compared with adults [2].

A study conducted by Yaldrim et al. [2] in 2008 showed etiology and pathological characteristics of adult and childhood adenoid hypertrophy (AH). Clinical and morphological features and accompanying otolaryngological pathologies were recorded in 40 adults and 23 children undergoing adenoidectomy for obstructive adenoid hypertrophy. Both adenoid hypertrophy forms were similar in terms of symptomatology and associated inflammations.

There were, however, significant differences in otitis media rate, with effusion and dullness, and retraction in the eardrum both more prevalent in childhood adenoid hypertrophy. Adult adenoid hypertrophy was associated with nasal septum deviation in 25.0 % of patients (45 % in our series). Histopathological features of adenoidal lymphoid tissue were dissimilar in the two groups: numerous lymph follicles with prominent germinal centres were the chief finding in childhood adenoids, whereas adult adenoids showed chronic inflammatory cell infiltration and secondary changes (e.g. squamous metaplasia). These results underline the importance of considering adenoid hypertrophy as a cause or contributing factor in nasal obstruction and related pathologies in adults and support the theory that it represents a long-standing inflammatory process rather than being a novel clinical entity.

Head and neck manifestations of acquired immunodeficiency syndrome (AIDS) are among the most common complications of this disease. Some of these manifestations are the initial signs of HIV infection, and others are associated with full-blown AIDS. Adenoid hypertrophy can be a presentation of HIV infection [14].

In studies where they have been compared to more normal-sized adenoids, a chronic infection with Hemophilus influenza, normal bacteria of the upper respiratory tract, has been identified. The adenoid can also hypertrophy from chronic irritation from infected or inflamed nasal secretions being swept back over it. There may be some adenoidal enlargement occurring with chronic allergic states. Adenoidal hyperplasia in adults is quite rare. If it is identified, malignancies of the type B white blood cell (lymphoma plasmacytoma) or HIV must be considered. In our series Allergy was associated with 30 % of the adenoid hypertrophy in adult. HIV infection was associated with 3.3 % cases and non Hodgkin's and other sinonasal malignancy was associated with 3.3 % cases each. Descending infection is responsible for 33.3 % cases of adenoid hypertrophy where as ascending infection is responsible for 20 % cases.

Long-term adenoidal enlargement can lead to ear disease and chronic mouth-breathing. There is some concern that chronic mouth-breathing in children may result in elongation of the middle part of the face and a narrow, high-arched palate that can result in orthodontic abnormalities. Undiagnosed obstructive sleep apnea may cause pulmonary hypertension, poor mental alertness, and hypertrophy of the right side of the heart.

If the adenoidal enlargement is fairly acute, it will often respond to antibiotics and oral steroids. In some individuals a big adenoid can be reduced by long term nasal steroid sprays. In those who do not respond to these forms of medical management, surgery is often employed. In a study by Demirhan et al. [15] in 2010 showed that 76 % patients

having adenoid hypertrophy, surgery was eliminated by using fluticasone propionate nasal drop.

If the adenoid is acutely enlarged and responds well to antibiotic and steroid therapy, then it will return to a smaller size, with lessening of the amount of nasal obstruction. However, if the adenoid re-enlarges and recreates the symptoms, surgery would then be necessary. Typically those individuals who have required adenoidectomy have an improvement in eustachian tube function and lessening of their nasal obstruction and excessive nasal discharge; and in those children who have had their adenoid removed for chronic sinus disease, 25 % of them will have their sinus disease resolve.

In adult, adenoid hypertrophy can be very dangerous as it is associated with lymphoma and other malignancy and sometimes with HIV infection. With early treatment prognosis may be good. So any case of adult adenoid hypertrophy should not be neglected.

Conclusion

In conclusion adenoid hypertrophy is common and a normal finding in children. And it is an uncommon finding in adults. Now the incidence of adult adenoid hypertrophy is increasing because of allergy, chronic infection and malignancy. Pollution is thought to be a predisposing factor. It is also found associated with HIV infection which is now increasing through out the world.

Study shows that 21 % of adult nasal obstruction is due to adenoid hypertrophy. But in case of the patient with chronic tonsillitis only 9 % were associated with adenoid hypertrophy. Males are more commonly involved (70 %) then female may be because of out door activities and more commonly exposed to pollutants. And most commonly involved age group is 16–25 years (60 %). Majority of the cases with adenoid hypertrophy are associated with infection and allergy i.e. descending infection in 33.3 % cases, ascending infection in 20 % cases and allergic rhinitis in 30 % cases.

Association of malignant sinonasal tumors, non Hodgkin's lymphoma and HIV infections are rare i.e. 3.3 % each. Still as these are dangerous conditions and prognosis

depends upon early diagnosis and treatment these should not be neglected.

So early identification of adults with adenoid hypertrophy should be considered for early management.

References

1. Wysocka J, Hassmann E, Lipska A, Musiatowicz M (2003) Naïve and memory T cells in hypertrophied adenoids in children according to age. *Int J Pediatr Otorhinolaryngol* 67:237–241
2. Yildirim N, Sahan M, Karsliglu Y (2008) Adenoid hypertrophy in adults: clinical and morphological characteristics. *J Int Med Res* 36:157–162
3. Kamel RH, Ishak EA (1990) Enlarged adenoid and adenoidectomy in adults: endoscopic approach and histopathological study. *J Laryngol Otol* 104:965–967
4. Bitar MA, Rahi A, Khalifeh M, Madanat LM (2006) A suggested clinical score to predict the severity of adenoid obstruction in children. *Eur Arch Otorhinolaryngol* 263:924–928
5. Brodsky L (1989) Modern assessment of tonsils and adenoids. *Pediatr Clin North Am* 36:1551–1569
6. Brandtzeag P (2003) Immunology of the tonsils and adenoids: everything the ENT surgeon needs to know. *Int J Pediatr Otorhinolaryngol* 67:69–76
7. Modrzynski M, Zawisza E, Rapijko P (2003) Serum immunoglobulin E levels in relation to Waldeyer's ring surgery. *Przegl Lek* 60:325–328
8. Yuce I, Somdas M, Ketenci I, Caqli S, Unlu Y (2007) Adenoidal vegetation in adults: an evaluation of 100 cases. *Kulak Burun Boqaz Ihtis Derg* 17(3):130–132
9. Minnigerode B, Blass K (1974) Persistent adenoid hypertrophy [Die persistierende Rachenmandel-hypertrophy]. *HNO* 22:347–349 [in German]
10. Frenkiel S, Black MJ, Small P (1980) Persistent adenoid presenting as a nasopharyngeal mass. *J Otolaryngol* 9:357–360
11. Finkelstein Y, Malik Z, Kopolovic J et al (1997) Characterization of smoking-induced nasopharyngeal lymphoid hyperplasia. *Laryngoscope* 107:1635–1642
12. Barcin C, Tapan S, Kursakloglu H et al (2005) Türkiye!de saglikli genç eris_kinlerde koroner risk faktörlerinin incelenmesi: Kesitsel bir analiz. *Türk Kardiyoloji Dern Ars* 33:96–103
13. Hamdan AL, Sabra O, Hadi U (2008) Prevalence of adenoid hypertrophy in adult with nasal obstruction. *J Otolaryngol Head Neck Surg* 37(4):469–473
14. Moazzez AH, Alvi A (1998) Head and neck manifestations of AIDS in adults. *Am Fam Physician* 57(8):1813–1822
15. Demirhan H et al (2010) Medical treatment of adenoid hypertrophy with fluticasone propionate nasal drop. *Int J Pediatr Otorhinolaryngol* 74(7):733–736