

Adenoid and Tonsil Hypertrophy in Zaria, North Western Nigeria: Review of Clinical Presentation and Surgical Outcome

Abstract

Background: Adenotonsillar hypertrophy is one of the most common childhood disorder that necessitates presentation to the ear nose and throat specialist. The disorder may be managed conservatively or by surgery. **Aim:** To highlight the clinical presentation and surgical treatment outcome of patients managed for adenoid and tonsillar hypertrophy at Ahmadu Bello University Teaching Hospital Zaria, Nigeria. **Materials and Methods:** The case records of patients managed for adenoid and tonsil hypertrophy were reviewed from January 2013 to December 2017 at the Division of Otorhinolaryngology, Department of Surgery Ahmadu Bello University Teaching hospital Zaria, - Northwestern Nigeria. Case notes with incomplete information and /or missing pages were excluded. The data were analyzed using IBM SPSS (for windows, version 23) **Results:** There were 56 (55.4%) males and 45 (44.6%) females with male to female ratio of 1.2:1. Their ages ranged from 2–16 years with a mean and standard deviation of 4.0 and 3.2 respectively. The most common symptom at presentation was snoring 85 (84.2%) followed by rhinorrhea 81(80.2%). Findings from the radiologic investigations revealed that majority of the patients had severely narrowed nasopharyngeal air column 83(82,2%) Adenotonsillectomy was the most common surgery performed on most of the patients 63(62.4%) who presented with adenotonsillar hypertrophy. Majority of the patients 95(94.1%) had resolution of symptoms within the period of follow up. Four (4.0%) of them had recurrent adenoidal growth. **Conclusion:** Snoring, rhinorrhea and mouth breathing were the most common symptoms of adenotonsillar hypertrophy. The outcome of adenotonsillar surgeries in our patients is good, with the majority having resolution of symptoms.

Keywords: Adenotonsillar hypertrophy, adenotonsillectomy, clinical presentation, outcome

Introduction

Adenoid and tonsil are lymphoid tissues located in the nasopharynx and oropharynx respectively. They form part of Waldeyer's ring.^[1] This ring consists of adenoids, tubal tonsils, posterior and lateral pharyngeal bands, palatine and lingual tonsils.^[1,2] Adenoids and tonsils are believed to develop from the epithelium of primitive oronasal cavity and mesenchymal stroma of lymphoid cells and they continue to increase in size and reach a peak around 7th year.^[3] In most cases adenoids usually completely involute at 20 years.^[3]

These structures are also called mucosa-associated lymphoid tissues (MALT) and are predominantly of B cell organ.^[4] B cells account for 50% to 65% of all adenoid and tonsillar lymphocytes.^[4] About 40% and 3% of the adenoids and tonsils consist of T cells and mature plasma cells respectively.^[4] These cells produce antibodies, lymphokines, and gamma

interferon..^[4,5] While adenoid enlargement may present with predominantly nasal symptoms such as recurrent rhinorrhea, mouth breathing, noisy breathing and otologic disorder like otitis media, the tonsil may present as recurrent tonsillitis and rarely Peritonsillar abscess. Adenotonsillar hypertrophy (ATH) refers to abnormal growth of the adenoid and palatine tonsil in the same patient. It is one of the most common causes of sleep-disordered breathing in children and maybe a source of morbidity in some. It may also be a source of concern and anxiety in the parents of symptomatic children.^[6]

There is currently a dearth of literature on the clinical presentation and treatment outcome of adenoid and tonsil hypertrophy in Nigeria. Although patients with these diseases are being managed regularly in our hospitals, many of them may have received different forms of treatment before referral to Otorhinolaryngologist. Highlighting clinical presentation and outcome of treatment of this disorder will go a long way in improving the management of the disease and aid further research.

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This study aims at highlighting the clinical presentation and surgical outcome of patients managed at Ahmadu Bello University Teaching Hospital (ABUTH) for adenoids and tonsil hypertrophy over 5 years.

Materials and Methods

This was a retrospective descriptive study of patients who were managed for Adenotonsillar hypertrophy (ATH) at the division of Otorhinolaryngology of the Department of Surgery Ahmadu Bello University Teaching hospital Zaria, Kaduna, Nigeria. Ethical approval was obtained from the Ethics Review Committee of Ahmadu Bello University Teaching Hospital. The record of patients managed for enlarged adenoids and tonsils over a 5-year period between January 2013 and December 2017 was reviewed. Clinical data retrieved from the patient's record included demographic characteristics such as age, sex, main presenting symptoms, diagnosis and findings from the radiograph as reported by the radiologist. Other information obtained from the patient's record included the types of surgery offered and the outcome. Excluded from the study were patients whose case records were either not found or did not have complete information.

Our protocol for managing patients with adenoid and tonsillar enlargement involved detailed history, examination and investigation. Plain radiograph of the postnasal space was the radiological investigation of choice. It is part of our routine to grade radiological findings into a mild, moderate or severe narrowing of the nasopharyngeal airway based on the method reported by Wormald *et al*^[7] and Kolo *et al*^[8] where the thickness of the soft palate in its superior anterior part and the air column immediately posterior to it are compared. Based on this, the airway is said to be normal/mild (grade 1) when the size of the airway is equal to or more than the size of the soft palate. When the size of the airway was less than the size of the soft palate but still greater than half the size of the soft palate, it was classified as moderately narrowed (grade 2). But when the size of the airway was less than half the size of the soft palate, it was classified as severely narrowed (grade 3). The tonsillar enlargement was graded using the Brodsky's^[9] criteria, which is based on the location of the tonsils in relation to the Oropharyngeal space. Grade 0 is when the tonsils are completely within the tonsillar fossae. Tonsils beyond the tonsillar fossae and occupying less than 25% of the Oropharyngeal width were termed grade 1. Grade 2 were the tonsils occupying more than 25% but not more than 50% of the Oropharyngeal width. Grade 3 is when the tonsils occupy more than 50% but not more than 75%. Tonsils occupying more than 75% of the Oropharyngeal width were labelled as grade 4. Patients with grade 3 adenoids were considered to have obstructive adenoidal disease, while patients with grades 3 and 4 tonsils were also considered to have obstructive tonsillar disease. Presence of both conditions constituted the obstructive Adenotonsillar disease. Patients with established indications had one of adenoidectomy, Adenotonsillectomy or tonsillectomy depending on the diagnosis. All the surgeries

were performed by the consultant Otorhinolaryngologist or senior Registrar under the supervision of the consultants

The data were entered into the spreadsheet and analyzed using the Statistical Package for Social Science version 23.0 (SPSS Inc., Chicago, Illinois, USA). Quantitative data were summarized as frequencies and percentages and presented as tables. Fisher exact test was used to determine P-value and to test statistical significance, which was set at a $P < 0.05$.

Results

From the 101 patients reviewed in this study, there were 56 (55.4) males and 45 (44.6) females with male to female ratio of 1.2:1. Their ages ranged from 2–16 years with a mean and standard deviation of 4.0 and 3.2 respectively. [See Table 1] The age group 2–4 year constituted the largest number 54 (53.5%), of patients seen, followed by 5-7year 32 (31.7%). The age group with the lowest number of patients were 11-13year and 14–16 year with 4 (4.0%) each. [See Table 1]

The most common symptom at presentation for patients with adenotonsillar hypertrophy was snoring 85 (84.2%) followed by rhinorrhea 81(80.2%) and mouth breathing 75 (74.3%). [See Table 2]

The obstructive adenotonsillar disease was the diagnosis in most of the patients 63(62.4%), followed by obstructive adenoidal disease 23(22.8%). Recurrent tonsillitis was the least diagnosis at presentation. [See Figure 1]

Findings from the radiologic investigations revealed that majority of the patients had severely narrowed nasopharyngeal air column 83(82.2%) followed by moderately narrowed nasopharyngeal air column. [See Table 3]

Adenotonsillectomy was the most common surgery performed on most of the patients 63(62.4%) who presented with ATH.

Table 1: Age sex distribution of the study population

Age group (years)	Male	Female	Total (%)
2-4	33	21	54 (53.5)
5-7	17	15	32 (31.7)
8-10	3	4	7 (6.9)
11-13	3	1	4 (4.0)
14-16	0	4	4 (4.0)
Total (%)	56 (55.4)	45 (44.6)	101 (100)

Table 2: Symptoms at presentation

Symptoms	Frequency	Percentage (%)
Snoring	85	84.2
Rhinorrhea	81	80.2
Mouth breathing	75	74.3
Restlessness during sleep	68	67.3
Recurrent sore throat	28	27.7
Odynophagia	19	18.8
Dysphagia	10	9.9
Hearing impairment	6	5.9

This was followed by adenoidectomy and tonsillectomy. [see Table 4] Most of the patients who had adenotonsillectomy were within the age range of 2–4 years followed by 5–7 years. There was a statistically significant relationship between the ages of the patients and type of surgery (Fisher Exact $P < 0.005$). [See Table 4]

Majority of the patients 95(94.1%) had resolution of symptoms within the period of follow up. Four (4.0%) of them had recurrent adenoidal growth. [See Table 5] There was a statistically significant relationship between the type of surgery and diagnosis at presentation (Fisher Exact $P < 0.005$)

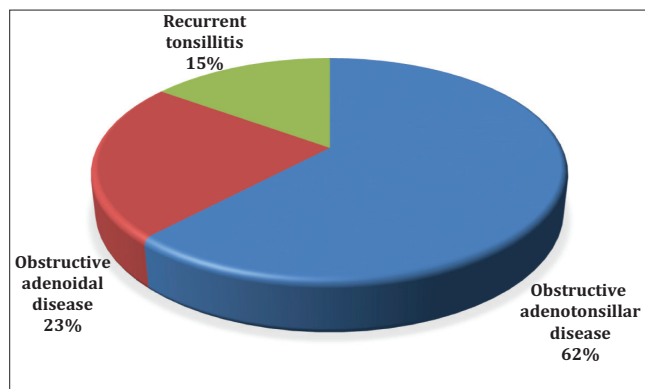


Figure 1: Diagnosis among the study population

Table 3: Findings from the radiographs

Lateral soft tissue neck radiograph	Frequency	Percentage (%)
Severe narrowing of nasopharyngeal airway	83	82.2
Moderate narrowing of nasopharyngeal airway	4	4.0
Mild narrowing or normal nasopharyngeal airway	14	13.9
Total	101	100

Discussion

Adenotonsillar hypertrophy is one of the most common childhood disorders that necessitate presentation to the ear nose and throat specialist.^[10] The disorder may be managed conservatively or by surgery. Majority of our study population (55.4%) were males and were between the ages of 2 and 7 years. A similar study by Adegbiyi *et al*^[11] from Nigeria also reported study population between 0 and 8 years. ATH is usually seen in children between 2 and 6 years of age and the process of lymphoid involution especially of adenoid may start after this age.^[12,13]

Recurrent snoring, rhinorrhea and mouth breathing are the most common symptoms our patients presented with. Lapinska *et al*^[14] also reported snoring and mouth breathing in 71.9% and 78.9% of their subjects respectively. Another study by Adegbiyi *et al*^[11] showed that snoring was the predominant symptom in 95% of their subjects. In ATH, snoring and mouth breathing may be a consequence of nasopharyngeal and oropharyngeal airway blockage. This may be pronounced when the patient is asleep in a supine position due to relaxation of the surrounding pharyngeal soft tissues.^[15]

The most common diagnosis in our patients at presentation was obstructive adenotonsillar disease followed by obstructive adenoidal disease. A similar finding was also reported in another study^[11] where obstructive Adenotonsillar disease was also the most common diagnosis followed by obstructive adenoidal disease.

Lateral radiograph of the neck and flexible nasopharyngoscopy are important in assessing adenoid hypertrophy.^[8] Our study showed that 82% of the study population had severe narrowing of the nasopharyngeal airway. We noted that the lateral radiograph in patients with the tonsillar disease only was normal. It has been suggested that lateral radiographs in patients with obstructive symptoms and tonsillar hypertrophy may not be necessary as it may not change the decision to

Table 4: Type of surgery offered to the patients

Age group (years)	Adenotonsillectomy	Adenoidectomy	Tonsillectomy	Total (%)
2-4	35	19	0	54 (53.4)
5-7	23	4	5	32 (31.7)
8-10	4	0	3	7 (6.9)
11-13	1	0	3	4 (4.0)
14-16	0	0	4	4(4.0)
Total (%)	63 (62.4)	23 (22.8)	15(14.8)	101 (100)

Table 5: Outcome of surgery in relation to diagnosis at presentation

Outcome	Recurrent tonsillitis	Obstructive adenoidal enlargement	Obstructive adenotonsillar hypertrophy	Total (%)
Resolution of symptoms	15	18	62	95 (94.1)
Recurrence	0	4	0	4 (4.0)
Post-operative bleeding	0	1	0	1 (1.0)
Dead	0	0	1	1 (1.0)
Total	15 (14.9)	23 (22.8)	63 (62.4)	101 (100)

intervene surgically.^[16] On the other hand, if a patient has obstructive symptoms and mild or no tonsillar hypertrophy, lateral radiograph becomes very important.^[16]

Adenotonsillectomy is a surgical procedure that involves complete removal of adenoid tissue in the nasopharynx as well as the removal of palatine tonsils including its capsules, by dissecting the peritonsillar space which separates the tonsils and its capsule from the muscular wall. In our study, adenotonsillectomy was the most commonly performed procedure followed by adenoidectomy and tonsillectomy. We noted that there was a statistically significant relationship between the type of the surgery and the ages of the study population. While the adenoidectomy/adenotonsillectomy were noticed to be the most common among the 2–4 years, tonsillectomy was observed to be more in those above 5 years. This may suggest that the involution process of adenoids occurs earlier in our environment when compared with the findings from the literature. The indications for adenotonsillectomy in our patients were sleep-disordered breathing (obstruction), recurrent infection of the tonsils, nose and paranasal sinuses and middle ear. Ahmed *et al*^[17] from Kano reported that in 68.7% of their patients, the indication for adenotonsillectomy was due to obstruction. Indications for surgery in our patients were considered after failure of conservative treatment using intranasal steroid, decongestant, mucolytics, antiallergic and also antibiotics in documented evidence of infection.^[14]

Ninety-four percent of our patients had complete resolution of symptoms after surgery. Most of our patients were followed up between 6 weeks to 6 months after surgery. The most common complication observed in this study was recurrent adenoidal growth seen in 4% of the study population. These patients had surgery at a mean age of 2 years. And recurrence was observed within 18 months after adenoidectomy which necessitated revision surgery in all of them. A cohort study identified young age at initial surgery to be an important factor associated with revision adenoidectomy.^[18,19] Another retrospective study reported that children who had adenoidectomy at an age younger than 5 years had 2.5 times the risk of requiring revision adenoidectomy.^[20] Other factors found to be associated with increased risk of adenoid regrowth were coexistent Bronchial asthma, allergic rhinitis and also in patients who had adenoidectomy without tonsillectomy.^[21]

Reactionary hemorrhage is one of the most common complications which usually occurs within 6 to 12 hours after Adenotonsillectomy.^[22] It is estimated to be about 0.7% and between 1 and 2% following adenoidectomy and tonsillectomy respectively.^[22] In this study, we found 1 (1%) patient with post adenoidectomy bleeding. However, the patient was managed with a post nasal pack using the Foley catheter in the ward. Even though post-tonsillectomy hemorrhage was more common, no single case was recorded in this study. We recorded 1 case of mortality in a 4-year-old male with background cerebral palsy 8 hours after Adenotonsillectomy due to respiratory failure. In

a similar retrospective study conducted in Sweden, 2 mortalities were recorded out of the 82,527 and were due to post-operative bleeding.^[23] In the United States of America and England, mortality due to tonsillectomy has been estimated to be in the range of 1 in 10,000 to 1 in 28,000.^[24,25] There are limited evidence to prove the role of postoperative hemorrhage, apnea, aspiration, and anesthetic factors in tonsillectomy related mortality. It has been speculated that children with neurological impairment, obesity and those with Down syndrome may be at increased risk.^[26]

Conclusion

Snoring, rhinorrhea and mouth breathing were the most common symptoms of adenotonsillar hypertrophy. Involution of adenoids appears to start early in our environment. The outcome of adenotonsillar surgeries in our patients is good, with the majority having resolution of symptoms. All clinicians dealing with pediatric patients should be conversant with the clinical presentation of adenotonsillar hypertrophy as this will improve the management of children with such disease.

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Conflicts of interest

There are no conflicts of interest.

References

1. von Waldeyer-Hartz HWG. Über den lymphatischen Apparat des Pharynx. Dtsch Med Wochenschr 1884;10:313.
2. Mbam TT, Adeosun AA, Akinyemi OA, Nwaorgu OG. Comparing oxygen saturation of normal children with that of children with adenotonsillar hypertrophy. Indian J Otolaryngol Head Neck Surg 2014;66:173-7.
3. Zojaji R, Mirzadeh M, Mazloun Farsi Baf M, Khorashadizadeh M, Sabeti HR. The effect of adenotonsillectomy on children's quality of life. Iran J Otorhinolaryngol 2014;26:199-205.
4. Richtsmeier WJ, Shikhani AH. The physiology and immunology of the pharyngeal lymphoid tissue. Otolaryngol Clin North Am 1987;20:219-28.
5. Hui-Leng T, David G, Leila KG. Obstructive sleep apnea in children: A critical update. Nat Sci Sleep 2013;5:109-23.
6. Kljajic Z, Roje Z, Brcic K, Capkun V. obstructive sleep apnoea in children: How it affects parental psychological status. Int J of Pediatr Otorhinolaryngol 2019;117:157-62.
7. Wormald PJ, Prescott CAJ. Adenoids: Comparison of radiological assessment methods with clinical and endoscopic findings. J Laryngol Otol 1992;106:342-4.
8. Kolo ES, Salisu AD, Tabari AM, Dahilo EA, Aluko AA. Plain radiographic evaluation of the nasopharynx: Do raters agree? Int J Pediatr Otorhinolaryngol 2010;74:532-4.
9. Brodsky L. Modern assessment of tonsils and adenoids. Pediatr Clin North Am 1989;36:1551-69.
10. Soheila N, Fakher R, Hatam B, Shirazi STB, Saki N. The effect of adenotonsillectomy on quality of life in adults and pediatric patients. Indian J Otolaryngol Head Neck Surg 2012;64:181-3.
11. Adegbiyi WA, Aremu SK, Nwawolo CC, Asoegwu CN. Current trends of adenotonsillar hypertrophy presentation in a developing country. Nigeria Int J Otorhinolaryngol Head Neck Surg 2017;3:501-5.

12. Tagaya M, Nakata S, Yasuma F, Miyazaki S, Sasaki F, Morinaga M, *et al.* Relationship between adenoid size and severity of obstructive sleep apnea in preschool children. *Int J Pediatr Otorhinolaryngol* 2012;76:1827-30.
13. Pac A, Karadag A, Kurtaran H, Aktas D. Comparison of cardiac function and valvular damage in children with and without adenotonsillar hypertrophy. *Int J Pediatr Otorhinolaryngol* 2005;69:527-32.
14. Łapińska I, Zawadzka-Głós L. Adenoid and tonsils hypertrophy—symptoms and treatment. *New Med* 2016;20:103-6.
15. Gislason T, Benediktsdóttir B. Snoring, apneic episodes, and nocturnal hypoxemia among children 6 months to 6 years old. An epidemiologic study of lower limit of prevalence. *Chest* 1995;107:963-6.
16. Peyton WS, Woolley AL, Wiatrak BJ. Pharyngitis and adenotonsillar disease. In: Paul WF, Bruce HH, editors. *Cummings Otolaryngology-Head and neck Surgery*. 5th ed. Philadelphia: Mosby Elsevier; 2010 p. 2047-89.
17. Ahmed AO, Aliyu I, Kolo ES. Indications for tonsillectomy and adenoidectomy: Our experience. *Niger J Clin Pract* 2014;17:90-4.
18. Hultcrantz E, Ericsson E, Hemlin C, Hessén-Söderman AC, Roos K, Sunnergren O, *et al.* Paradigm shift in Sweden from tonsillectomy to tonsillotomy for children with upper airway obstructive symptoms due to tonsillar hypertrophy. *Eur Arch Otorhinolaryngol* 2013;270:2531-6.
19. Odhagen E, Sunnergren O, Hemlin C, Hessén Söderman AC, Ericsson E, Stalfors J. Risk of reoperation after tonsillotomy versus tonsillectomy: A population-based cohort study. *Eur Arch Otorhinolaryngol* 2016;273:3263-8.
20. Sunnergren O, Hemlin C, Ericsson E, Hessén-Söderman AC, Hultcrantz E, Odhagen E, *et al.* Radiofrequency tonsillotomy in Sweden 2009-2012. *Eur Arch Otorhinolaryngol* 2014;271:1823-7.
21. Alkhatib T, Khashoggi K, Bukhari AF, Malaikah RH, Ageely G, *et al.* An eight-year case control study identifying predictors of adenoid recurrence. *Inter J Otorhinolaryngology* 2017;4:4.
22. Robb PJ. Tonsils and adenoids. In: Hussain SM, editor. *Logan turner's Diseases of the Nose, Throat and Ear Head and Neck Surgery*. 11 ed. New York: CRC press; 2016. p. 533-41.
23. Østvoll E, Sunnergren O, Ericsson E, Hemlin C, Hultcrantz E, Odhagen E, *et al.* Mortality after tonsil surgery, a population study, covering eight years and 82,527 operations in Sweden. *Eur Arch Otorhinolaryngol* 2015;272:737-43.
24. Tate N. Deaths from tonsillectomy. *Lancet* 1963;2:1090-1.
25. Goldman JL, Baugh RF, Davies L, Skinner ML, Stachler RJ, Brereton J, *et al.* Mortality and major morbidity after tonsillectomy: Etiologic factors and strategies for prevention. *Laryngoscope* 2013;123:2544-53.
26. Statham MM, Myer CM 3rd. Complications of adenotonsillectomy. *Curr Opin Otolaryngol Head Neck Surg* 2010;18:539-43.