

Evaluation of Adenoid Hypertrophy by Lateral Radiograph for Nasopharynx and by Rigid Nasal Endoscopy: A Prospective Comparative Study

Abdul Azeez Vallur

How to cite this article:

Abdul Azeez Vallur. Evaluation of Adenoid Hypertrophy by Lateral Radiograph for Nasopharynx and by Rigid Nasal Endoscopy: A Prospective Comparative Study. RFP J ENT Allied Sci. 2019;4(2):53-56.

Author Affiliation: Associate Professor, Department of ENT, Dr. V.R.K. Womens Medical College, Aziz Nagar, Moinabad, Hyderabad, Telangana 500075, India.

Corresponding Author: Abdul Azeez Vallur, Associate Professor, Department of ENT, Dr. V.R.K. Womens Medical College, Aziz Nagar, Moinabad, Hyderabad, Telangana 500075, India.

E-mail: azeez_imam@yahoo.com

Received on 19.12.2019; Accepted on 30.12.2019

Abstract

Background: Adenoid, also termed as nasopharyngeal tonsil, Lushka's tonsil, is located at the junction of roof and posterior wall of the naso-pharynx. Infections like recurrent rhinitis, sinusitis, tonsillitis can cause chronic Adenoid infection and hypertrophy which can be diagnosed by a postnasal mirror examination, rigid nasal endoscopic examination. **Objectives:** To relate adenoid hypertrophy by performing x ray nasopharynx lateral view for soft tissues and diagnostic rigid nasal Endoscopy. **Methodology:** It was a prospective study conducted among patients visiting tertiary care institute both pediatric and adult group both in patient and out-patient departments of ENT. Patients were selected as case material, with clinical features of Nasal obstruction, Nasal discharge, Sinusitis, Epistaxis, Voice change, Aural symptoms like Tubal obstruction etc were selected. A detailed clinical examination is done. SPSS 21 was used for analysis. Nonparametric test and correlation value were computed. **Results:** 50 patients were studied as the sample size, all of whom were subjected to both the modalities of investigation, after entering the results in a master charta statistical analysis was done. Value calculated showed a result of +0.795, which is approximating to +0.8, that is very much nearer to +1, showing very strong and positive relation between X-ray and Rigid endoscopic grade which means that x-ray nasopharynx lateral view for soft tissues is nearly as reliable as Rigid endoscopy and thus can be used as reliable tool in diagnosing Adenoid hypertrophy. **Conclusion:** Even in this endoscopic era, x-ray nasopharynx lateral view for soft tissue can be useful and as reliable as a diagnostic tool for the diagnosis of adenoid hypertrophy, which may be the only available investigation in the absence of rigid nasal endoscopic equipment.

Keyword: Adenoid hypertrophy; Nasal endoscopy; Airway obstruction; Nasal discharge; Sinusitis; X-ray nasopharynx.

Introduction

Adenoid or Nasopharyngeal tonsil form the central part of the ring of lymphoid tissues surrounding the oro-pharyngeal isthmus, called Waldeyer's ring at the portal of upper respiratory tract. In early

childhood it is the first site of contact for inhaled antigens. Historically adenoid has been associated with upper airway obstruction, as a focus of sepsis, more recently with the persistence of otitis media with effusion. Adenoid can be identified by MRI from the age of four months in 18% of the children.¹

By 5 months of age, the adenoid tissue could be identified in almost all children. Growth continues during infancy and plateaus between 2 and 14 years of age. Regression of the adenoids occurs rapidly after 15 years of age in most children the adenoids appears to be at its largest size in 7 years old agegroup.² With the arrival of endoscopy, now a more commonly used as the diagnostic tool for adenoid hypertrophy there are many false negative and false positive reports when x ray is exclusively used as a diagnostic tool. The rationale behind the study was to establish a correlation about how far x ray is effective in diagnosing the adenoid hypertrophy, in comparison with RNE.

Materials and Methods

This was a prospective interventional study planned for a period of nearly 1 years from July 2018 to June 2019. Patients visiting tertiary care institute both paediatric and young adult group both in patient and out -patient in Department of ENT were selected as study subject with clinical features of Nasal obstruction, Nasal discharge, Sinusitis, Epistaxis, Voicechange, Aural symptoms like Tubal obstruction, Recurrent acute otitis media, Serous otitis media with fluctuating hearing loss, general features of Adenoid facies and Pulmonary hypertension are selected. Both pediatric and adult age group patients are selected, and detailed clinical examination done relevant investigations are carried out and correlation is made between X ray Naso-pharynx lateral view for soft tissues and Diagnostic rigid nasal endoscopy. Patients with nasal polyps, Growths, deviated nasal septum. X ray neck lateral view for soft tissue to see Adenoid: Nasopharynx ratio: Graded as- 1,2,3,4. Patient's neck kept in minimum extension are excluded.

Materials and Methods

Endoscopy is done After application of local anesthesia by nasal packs with 4% lignocaine and adrenaline (1:80000), 30-degree 4 mm storz Rigid nasal endoscope is passed with patient in supine position. The space between the posterior end of septum and roof of nasopharynx anteroposterior and between the two eustachian tube orifices laterally is taken into consideration to see the extent of adenoids hypertrophy in two dimensions. The radiograph taken is x- ray nasopharynx lateral view for soft tissues. It is taken with patient in supine position and neck slightly extended.

Siemen'S Multix machine was used, and x ray field was collimated to the nasopharynx, with a focus film distance of 40 inches using average exposure factors of 60 kv and 3.2 milli-ampere-seconds. Fujioka method³- It is the method selected for estimating the nasopharyngeal air way obstruction by adenoid hypertrophy. Adenoid thickness is defined as the distance along a perpendicular line from the pharyngeal tubercle on the base of skull to the adenoid convexity. This is the method followed for estimation of Adenoid hypertrophy on an X - ray lateral view of the nasopharynx for soft tissues. X -ray is taken in deep inspiration and the neck is kept in partially extended, with beam of X - ray being focused on the nasopharynx region. The distance between the outermost point of the convexity of Adenoid shadow and Spheno-basiociput, [A], is divided to distance between spheno-basiociput and posterior end of the Hard palate, [N]. When synchondrosis is not clearly visualized, the point where posteroinferior margin of lateral pterygoid plates crosses the floor of bony nasopharynx can be used.

Table 1: Adenoid Hypertrophy grading by FUJIOKA method

Grade	A/N Ratio
1	¼ to 1/3
2	1/3 to 2/3
3	2/3 to near complete occlusion
4	Complete occlusion



Fig. 1: X ray nasopharynx lateral view - Methodology of measurement of adenoid hypertrophy

Statistical Analysis

The above data is compared using a scientific approach, as to how much an x -ray Nasopharynx is reliable when compared to the other diagnostic

modality. To relate how far X-ray Nasopharynx lateral view for soft tissues is on par with Diagnostic Rigid Nasal Endoscopy. Kendall - Tau's 13 correlation method after analysis gives a value which is in between -1 to +1, and if the result is nearer to +1, it suggests that a positive. SPSS -Version 21 Software was used for analysis.

Results

Table 2: Age and Sex wise distribution of study participants (n = 50)

Age (years)	Males (n = 30)	Females (n = 20)	p-value
0-5	3	2	0.11
5-10	6	3	
10-15	15	7	
15-20	6	8	

As per Table 3 the study was male preponderance comprising 60% of total study subjects. The most common age group was found to be 10-15 years (50%) in males and 15-20 years (45%) in males. The least common age group was 0-5 years. Which signifies that adenoid hypertrophy was not common in young age group, while in males and females it was in different in age group but not significant which means it is comparable.

Table 3: Presenting complaints in the study participants (n = 50)

Chief complaints	N (%)
Nasal blockage	22 (44)
Sore throat	10 (20)
Nasal discharge	5 (10)
Ear discharge	5 (10)
Snoring	3 (6)
Sneezing	3 (6)
Decreased hearing	2 (4)

As per Table 3 the most common chief complaint was found to be nasal blockage seen in 44% of cases, followed by 20% in sore throat. Nasal discharge and ear discharge were seen in 10% of cases. While the least common complaint was found to be decreased hearing.

Table 4: Rigid Nasal Endoscopy with respect to Adenoid Hypertrophy

Grade	N (%)
1	18 (36)
2	24 (48)
3	6 (12)
4	2 (4)

As per Table 4 grades are set according adenoid hypertrophy in terms of rigid nasal endoscopy. As seen, most of the patient are Grade 2 (48%) as per diagnostic basis followed by Grade 1 in 36% of patients. Grade 3 and 4 are least diagnostic.

Table 5: X ray with respect to Adenoid Hypertrophy

Grade	N (%)
1	22 (44)
2	22 (44)
3	3 (6)
4	3 (6)

As per Table 5 grades are set according adenoid hypertrophy in terms of x ray. As seen, most of the patient are Grade 2 and 1 equally (44%) as per diagnostic basis. Grade 3 and 4 are least diagnostic. This further concludes that x-ray can be a reliable diagnostic modality in the absence of rigid nasal endoscopy.

Table 6: Correlation between X-ray and Rigid Nasal Endoscopy in the view of soft tissue

Grade	r (Xray)	r (RNE)	p-value
1	0.795	0.80	0.001*
2	0.664	0.996	0.01*
3	0.210	0.761	0.01*
4	0.113	0.321	0.01*

As seen through Table 6 in the view of soft tissue and adenoid hypertrophy both X-ray and rigid nasal endoscopy showed positive correlation which was found to be highly significant (p < 0.05). This concludes that though nasal endoscopy is superior than X-ray, but it is equally effective diagnostic technique.

Discussion

P.J. Wormald demonstrated the efficacy of flexible naso-pharyngoscopy compared with lateral neck radiography and clinical symptoms in the assessment of adenoid hypertrophy in children's. Chandrasekhar et al. studies correlates with the study.⁴ Babak Saedi, Mohammed Sagedhi, et al. study was designed for better understanding of the role of different methods of nasal endoscopy in the assessment of adenoid hypertrophy and comparing them with lateral neck radiography and patients' symptoms. The results of the study indicated that both radiography and nasal endoscopy could define the relationship between adenoid hypertrophy and associated symptoms

and therefore are complementary.⁵ Between them, despite the popularity of nasal endoscopy, radiography can serve as a better planning tool. S.B. V chandrasekhar et al. study got similar result Mary Kurienetal used X-Rays in the evaluation of adenoid hypertrophy. Lateral radiograph of the neck and aflexible nasopharyngeal endoscopy was done to evaluate adenoid enlargement in children aged 3-12 years who were included in a 5-week randomized double-blind placebo-controlled study for the effect of beclomethasonein adenoid hypertrophy.⁶ These were graded independently by both the co-investigator and investigator X-ray and nasal endoscopy for re-evaluation of adenoid size was done at the completion of the study. Variables of both the procedures were scored at the beginning and end of the study. This study showed that lateral X-rays of the neck, besides being a non-invasive procedure, remains a very reliable and valid diagnostic test in the evaluation of hypertrophied adenoids. Navin kondapati et al. in their study, 13 cases of adenoid hypertrophy were seen between the age group of 18 to 39 years. Patients came with complaints of nasal obstruction, snoring and mouth breathing. Diagnostic nasal endoscopy showed enlarged soft tissue in the nasopharynx, probably hypertrophied adenoids. Computerised tomography was done to rule out other differential diagnosis.⁷ After surgical excision the tissue was sent for histopathological examination that confirmed diagnosis. For complete removal trans nasal endoscopes were used in assistance. Patients were regularly followed up for any recurrence. At the end of the study they concluded that instead of regressing in a natural physiological way with age, adenoids can remain in the nasopharynx, sometimes getting enlarged due to infection. One should keep enlarged adenoids as differential diagnosis in adults while dealing with a nasopharyngeal lesion. Our study goes in favour of their findings. In a Comparison between radiological and Nasopharyngolaryngoscopic assessment of adenoid tissue volume in mouth breathing children. Gangadhara Somayaji K. S., et al. In a study of Significance of Adenoid Nasopharyngeal Ratio in the Assessment of Adenoid Hypertrophy in Children.⁸ Radiological assessment of lateral radiograph of nasopharynx was done. On analysis of the results, x-raynasopharynx lateral view for soft tissues can be helpful asa diagnostic tool in patients having adenoid hypertrophy even in

the endoscopic era and it can be used as an aid for preoperative investigation when endoscopic equipment is not available.

Conclusion

On analysis, the results, x-ray nasopharynx lateral view for soft tissues can be helpful as a diagnostic tool in patients having adenoid hypertrophy even in the endoscopic era, and it can be used as an aid for preoperative investigation when endoscopic equipment isnot available.

Source of Funding: None

Conflict of Interest: None declared

References

1. Jaw TS, Sheu RS, Liu GC, Lin we. Development of adenoids: A study by measurements of MRI images. kaoshing journal of medical sciences 1999;15(1):12-18.
2. Volger RC, Ii Fj, pilgrim TK. Age specific size of normal adenoid pad on MRI. Clinical otolaryngology and allied sciences 2000;25:392-5.
3. Fujioka M, young LW, Girdany BR. Radiological evaluation of the adenoid size in children: Adenoid nasopharynx ratio. AJR Am J Roentgenol 1979;133:401-4.
4. PJ Weormald and CAJ Prescott journal of otology and laryngology 1992;106:342-34.
5. Babak S, Mohammad S, Mohammad M, Hossein M. Diagnostic efficacy of different methods in the assessment of adenoid hypertrophy American Journal of otolaryngology 2011 Mar-Apr;32(2):147-51.
6. Mary K, Anjali L, John M, et al. X-Rays in the evaluation of adenoid hypertrophy: It's role in the endoscopic era, Indian J Otolaryngol Head Neck Surg. 2005 Jan; 57(1):45-47.
7. Kondapati N, Shinde V, Deogawkar S, Ghatte G. Adenoid Hypertrophy in Adults - A Myth or Reality. Webmed Central otolaryngology 2013; 4(3):WMC004079.
8. Gangadhara Somayaji KS, Rajeshwari A, Mahaveera Jain. Significance of Adenoid. Nasopharyngeal Ratio in the Assessment of Adenoid Hypertrophy in Children. Research in Otolaryngology 2012;1(1):1-4.