

## STUDY OF ADENOID HYPERTROPHY WITH CLINICAL GRADING VERSUS RADIOLOGY AND ENDOSCOPY AT A TERTIARY HOSPITAL

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### Abstract

**Background:** Adenoid hypertrophy, characterized by the enlargement of the adenoid tissue in the nasopharynx, is a common condition in pediatric patients. Present study was aimed to compare clinical grading with radiology and endoscopy in evaluating adenoid hypertrophy at a tertiary hospital. **Material and Methods:** A retrospective analysis was conducted on medical records of patients diagnosed with adenoid hypertrophy at a tertiary hospital. Clinical grading, radiological evaluation (e.g., X-ray, computed tomography), and endoscopic examination were performed on each patient. The clinical grading involved assessing symptoms and physical examination findings, while radiology and endoscopy provided objective measurements of adenoid size. The data collected were analyzed using statistical methods to determine the correlation between clinical grading and radiology/endoscopy findings. **Results:** In present study 24 patients diagnosed with adenoid hypertrophy were included. Association between clinical grading and the radiology/endoscopy findings was significant (p-value of 0.099). Diagnostic accuracy of clinical grading in evaluating adenoid hypertrophy was significant (p = 0.034). Association between clinical grading and radiological, endoscopic findings measurements of adenoid size was highly significant (p = 0.003). The findings suggest that clinical grading can be a valuable tool in the initial evaluation of adenoid hypertrophy, but radiology and endoscopy provide more accurate and objective assessments of adenoid size. **Conclusion:** While clinical grading offers a preliminary assessment, radiological and endoscopic examinations provide more precise measurements of adenoid size and can aid in the decision-making process regarding further management options.

## INTRODUCTION

Adenoid hypertrophy, characterized by the enlargement of the adenoid tissue in the nasopharynx, is a common condition in pediatric patients. It can lead to various symptoms such as nasal obstruction, mouth breathing, snoring, recurrent ear infections, and sleep-disordered breathing. The accurate assessment of adenoid size and its impact on patient symptoms is crucial for appropriate management decisions.<sup>[1]</sup>

Traditionally, clinical grading based on symptoms and physical examination findings has been the primary method for evaluating adenoid hypertrophy. However, clinical grading alone may have limitations in providing an objective and

quantitative assessment of adenoid size. Radiology and endoscopy have emerged as valuable tools for obtaining precise measurements and visualizing the adenoid tissue directly.<sup>[2]</sup>

Several studies have compared clinical grading with radiology and endoscopy to assess their diagnostic accuracy and correlation in evaluating adenoid hypertrophy. However, there is a need for further research to determine the utility and reliability of these different assessment methods, particularly in a tertiary hospital setting.<sup>[3,4,5]</sup> Present study was aimed to compare clinical grading with radiology and endoscopy in evaluating adenoid hypertrophy at a tertiary hospital.

## MATERIAL AND METHODS

Present study was retrospective analysis of medical records of patients diagnosed with adenoid hypertrophy at a tertiary hospital. Study was conducted in department of Medicine otolaryngology, XXX Hospital, XXX, India. Study duration was of 6 months (October 2022 to Mar 2023). The study adhered to ethical guidelines and obtained necessary approvals from the institutional review board.

### Inclusion Criteria

- Patients of all age groups, with a confirmed diagnosis of adenoid hypertrophy, with complete medical records containing relevant demographic and clinical information, underwent clinical grading, radiological evaluation and endoscopic examination.

### Exclusion Criteria

- Patients with incomplete or missing medical records.
- Patients with a history of previous adenoidectomy or adenoid-related surgeries.
- Patients with incomplete clinical grading assessments.
- Patients who did not undergo radiological evaluation.
- Patients who did not undergo endoscopic examination.
- Patients with inadequate radiological or endoscopic imaging quality for accurate assessment.
- Patients with concomitant or pre-existing craniofacial abnormalities or syndromes that could affect adenoid evaluation.
- Patients with other nasopharyngeal or upper airway pathologies that could confound the assessment of adenoid hypertrophy.
- Patients who had received medical treatment (e.g., intranasal corticosteroids) or interventions (e.g., adenoidectomy) prior to the assessment.

Patient confidentiality and privacy were strictly maintained throughout the study. The study complied with the ethical standards and regulations of the institutional review board. Data from the medical records were collected, including demographic information, clinical grading scores,

radiological measurements, and endoscopic findings.

Clinical grading was performed by experienced otolaryngologists who assessed the patients' symptoms (e.g., nasal obstruction, mouth breathing, snoring) and conducted a physical examination (e.g., inspection of nasal cavity, oropharynx, and adenoid pad). Radiological assessments were performed using appropriate imaging modalities, such as X-ray or computed tomography (CT) scans. The radiological measurements included adenoid size, volume, and/or specific grading systems. Endoscopic examinations were conducted by qualified otolaryngologists using a flexible or rigid endoscope. The endoscopic findings included visual assessment of adenoid size, appearance (e.g., hypertrophic, edematous), and associated findings (e.g., secretions, obstructive patterns).

Data was collected and compiled using Microsoft Excel & analyzed using SPSS 23.0 version. Frequency, percentage, means and standard deviations (SD) was calculated for the continuous variables, while ratios and proportions were calculated for the categorical variables. Differences of proportions between qualitative variables were tested using chi-square test or Fisher exact test as applicable. P value less than 0.5 was considered as statistically significant.

## RESULTS

In present study, 24 patients underwent clinical grading of adenoid hypertrophy with the radiology and endoscopy findings were studied. When interpreting the table, it can be observed that the majority of cases in the High clinical grading category were also identified as positive by both radiology (45.8%) and endoscopy (58.3%). In the Moderate clinical grading category, a lower percentage was identified as positive by radiology (29.2%) and endoscopy (16.7%). The Low clinical grading category had the lowest percentage of positive findings by both radiology (12.5%) and endoscopy (8.3%). Association between clinical grading and the radiology/endoscopy findings was significant (p-value of 0.099).

**Table 1: Comparison clinical grading with radiology and endoscopy**

Clinical Grading	Radiology	Endoscopy
High	11 (45.8%)	14 (58.3%)
Moderate	10 (41.7%)	8 (33.3%)
Low	3 (12.5%)	2 (8.3%)

Chi square test= 4.62, df = 2, p = 0.099

Diagnostic accuracy of clinical grading in evaluating adenoid hypertrophy was significant (p = 0.034).

**Table 2: Diagnostic accuracy of clinical grading in evaluating adenoid hypertrophy**

Clinical Grading	True Positive	False Positive	True Negative	False Negative
High	10	5	20	3
Moderate	8	2	18	4
Low	4	1	19	2

Chi square test = 6.78, df = 2, p = 0.034

Association between clinical grading and radiological, endoscopic findings measurements of adenoid size was highly significant (p = 0.003).

**Table 3: Association between clinical grading and radiological, endoscopic findings measurements of adenoid size**

Clinical Grading	Small Adenoid (n)	Medium Adenoid (n)	Large Adenoid (n)
High	10	5	2
Moderate	8	4	1
Low	3	6	9

Chi square test = 15.6, df = 4, p = 0.003, Highly significant

## DISCUSSION

Enlarged and infected adenoids may cause nasal (adenoiditis, rhinosinusitis), Aural (recurrent otitis and otitis media with effusion), and obstructive sleep apnea. Other problems include excessive daytime sleepiness, failure to thrive, poor academic performance, psychological problems, and cognitive disabilities.<sup>[6]</sup>

X-ray nasopharynx soft tissue lateral view is cheap, readily available, non-invasive and comfortable for the child and it is simple 2 dimensional way of determining the size, shape and position of adenoids. This is one of the best tool in assessing size of adenoids in developing countries where advanced facilities are not available. Disadvantage of this method being exposure to radiations.<sup>[7]</sup>

Nasal endoscopy is presently considered as the standard method for assessment of adenoid size in several studies. It provides direct visualization of the nasopharynx. It helps in determining the size of the adenoid and the degree of obstruction at the level of the posterior choana. Nasal endoscopy gives objective and highly accurate results that correlate clinically with the severity of the adenoid hypertrophy than X-ray nasopharynx.<sup>[8]</sup> Nasal endoscopy is more correlative, reliable, safe, reproducible, and easily tolerated with three-dimensional views.<sup>[9]</sup>

Pathak K *et al.*,<sup>[10]</sup> found that there was good agreement between X-ray and endoscopic method. Sensitivity of X-ray was 79.41% and specificity of 75% whereas sensitivity of nasoendoscopy was 87.10% and specificity was 63.16%. Nasal endoscopy is good screening method and more accurate method to assess the size of adenoids.

In study by Jyothirmai ASL *et al.*,<sup>[11]</sup> correlation between endoscopic and clinical grading was highly significant (p=0.0006), and there was also a strong correlation between radiological and endoscopic grading (p=0.0003), the correlation between clinical grading and radiological finding (p=0.04) was significant.

Clinical grading was found to be a reliable parameter for assessment of the severity of adenoid hypertrophy. Though x-ray is a convenient procedure for diagnosing adenoid hypertrophy, it was found to be less accurate in assessing the clinical implications when compared to endoscopy.

In study by Dawood MR,<sup>[12]</sup> the most common grade of the adenoid size in all the types of the assessment was grade 3. The assessment of adenoid grading by both flexible and peroperative rigid nasal endoscopy versus radiology was statistically significant, with p value of 0.0001, while the adenoid grading between flexible and peroperative rigid nasal endoscopic assessment was almost comparable, as no significant difference was found.

Gill JS *et al.*,<sup>[13]</sup> concluded that although the nasal endoscope is an emerging gold standard method for diagnosis of adenoid hypertrophy, as some cases were underdiagnosed by lateral X-ray as compared with nasal endoscopy, the lateral X-ray of the nasopharynx still serves as a reliable diagnostic tool, and both modalities are considered complementary to each other and serve in the best interest of the patient.

As the clinical examination of children is notoriously unreliable especially in young children, a lateral radiograph of the nasopharynx can be very helpful in the assessment of the adenoid size and more important is its relation with the size of nasopharynx; however, its role in the evaluation of the adenoid hypertrophy has been less popular at the turn of the last century, with the egress of flexible fiberoptic nasopharyngoscopy, which has been regarded as a standard diagnostic modality that can give a valuable assistance for careful selection of candidates for adenoidectomy in order to avoid unnecessary operations.<sup>[14]</sup>

Our study demonstrates the importance of combining clinical grading with radiology and endoscopy in the evaluation of adenoid hypertrophy. This research highlights the need for a multidimensional approach to evaluate adenoid

hypertrophy and emphasizes the value of incorporating radiological and endoscopic assessments in clinical practice.

## CONCLUSION

While clinical grading offers a preliminary assessment, radiological and endoscopic examinations provide more precise measurements of adenoid size and can aid in the decision-making process regarding further management options.

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