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A STUDY ON THE ROLE OF DIAGNOSTIC NASAL ENDOSCOPY IN CHILDREN

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Abstract

With the advent of nasal endoscopes, diagnostic nasal endoscopy can be routinely used in children, aimed at avoiding radiological exposure and thus minimise the detrimental effects on the child. A total of 50 patients between 2-12 years were included in our study .Rigid zero degree paediatric nasal endoscopes (2 mm) were used. The most common findings were mucosal congestion, inferior turbinate hypertrophy, adenoid hypertrophy, septal deviation and sino-nasal polyps. Many ENT manifestations of symptoms have origin in the sino-nasal and nasopharyngeal area. Use of diagnostic nasal endoscopy reveals different findings, most notable being adenoid hypertrophy, sino-nasal polyps and rhinosinusitis. Paediatric nasal endoscopy can go a long way in providing a safe way of diagnosis and avoiding the hazards of radiation exposure in a growing child.

Introduction

The introduction of the Hopkins rod lens system of endoscopes coupled with some pioneering works by Messerklinger and Stammerberger in Europe and Kennedy in United States have vastly contributed to the understanding of the upper airways, subsequently making the diagnosis of various disorders easier, accessible and more economical. Being used in the initial years mostly for adult population, the advent of smaller paediatric endoscopes have opened up newer horizons for use in paediatric patients. Apart from the reasons of ease and economy, paediatric nasal endoscopy for diagnostic purposes also help to limit the amount of radiation exposure to a growing child, while providing equal or sometimes better diagnostic options when compared to radiological investigations. In our paper, we have tried to evaluate the role of diagnostic nasal endoscopy in children, especially aimed at preventing or minimising the radiological investigations.

Materials and methods

The study was conducted in Gauhati Medical College Hospital , a tertiary care hospital in Guwahati, Assam between 1st September 2012 and 31st august 2013 in the patients attending the outpatient department in Otorhinolaryngology.50 patients in the age group of 2 to 12 years with various symptoms like nasal obstruction, bleeding, discharge, decreased hearing etc. were randomly included in the study, of which 31 were boys(62%) and 19 were girls(38%).Detailed history was obtained from the guardians and patients, followed by standard clinical examination .Radiological investigations were advised in 30 patients while diagnostic nasal endoscopy was carried out in all of them.

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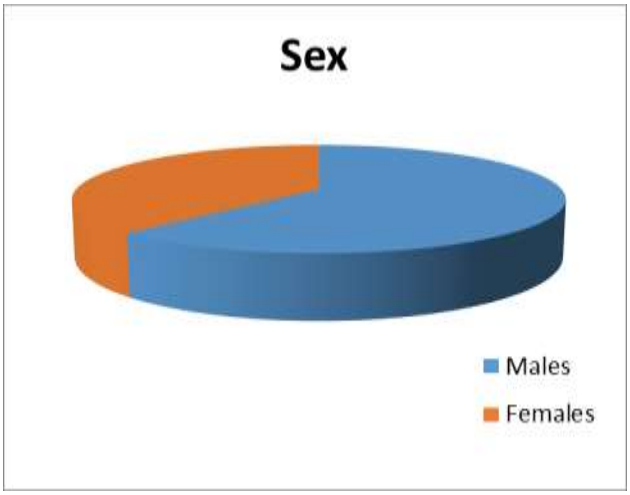

Fig. 1 Gender distribution

The choice of nasal endoscope was done related to the age and compliance of the pediatric patient. In compliant children and in those older than 8 years, 4-mm rigid nasal endoscopes were used and usually well tolerated and provided good endoscopic nasal views. Because of possible traumatic complications, in non-compliant children and in those younger than 8 years, 2 mm endoscopes were used. Before performing nasal endoscopy, the procedure was well explained to the guardians and they were taken into confidence. Subsequently, cottons soaked with decongestant(1:100000 diluted adrenaline) and local anaesthetic(4 % lignocaine) were placed in the nasal cavities for about 7-10 minutes which allowed for simultaneously augmenting the space of nasal cavities and obtaining a topical anaesthetic effect. During endoscopy, the child was placed in supine position with head end slightly high. After removal of cottonoids and treatment of the endoscopic lens with a thin film of anti-fog
solution, the endoscope is inserted slowly and delicately in the nasal cavity. First, the floor of the nose and nasal septum, inferior nasal turbinate and its meatus were examined. As the endoscope was taken posteriorly, the entire Nasopharynx and Eustachian Tube orifices were examined. Afterwards, coming back and turning the endoscope superiorly, the middle nasal turbinate and its meatus were explored . Endoscope was moved toward the uncinate process area; accessory maxillary sinus ostia, and sphenoethmoid recess were assessed. By rotating the endoscope superiorly when it is located anteriorly to the head of middle turbinate, the anterior olfactory region was observed. In addition to evaluation of nasal anatomy, assessment of mucosa status, the presence and type of endonasal secretions (i.e., serous, mucous, or purulent discharge) and their suspected origin, associated disorders, and their relationships with surrounding structures were also assessed. No major complications were encountered.

Observation and Results

The age group of the patients varied from 2 to 12 years with a mean age of 7 years. Males outnumbered females in the ratio of 1.6:1 .The most common clinical presentations (in descending order) were nasal obstruction(72%), nasal discharge(60%), nasal bleeding(56%), decreased hearing(40%), visible swelling over nose (4%)and proptosis(2%). The most common findings in nasal endoscopy were mucosal congestion(84%), inferior turbinate hypertrophy (70%), nasal discharge (60%), adenoid hypertrophy(56%), septal deviation(48%), nasal polyps (26%), vascular mass(4%) and expansile swelling (2%).

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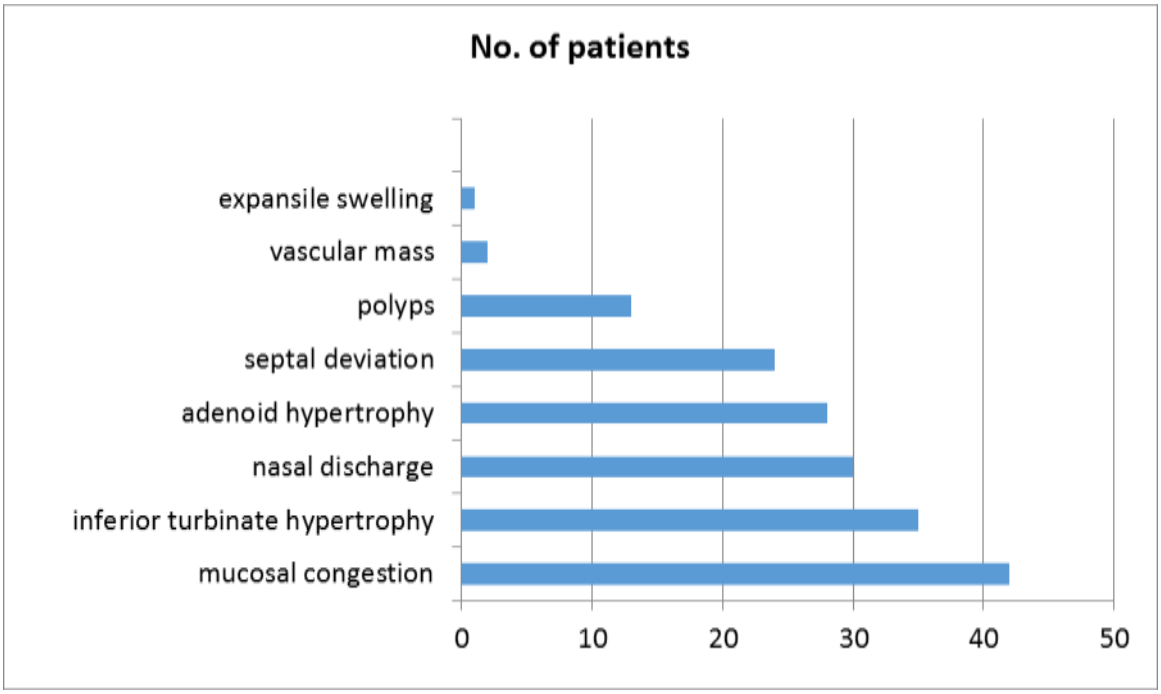

Fig. 2 Findings on diagnostic nasal endoscopy

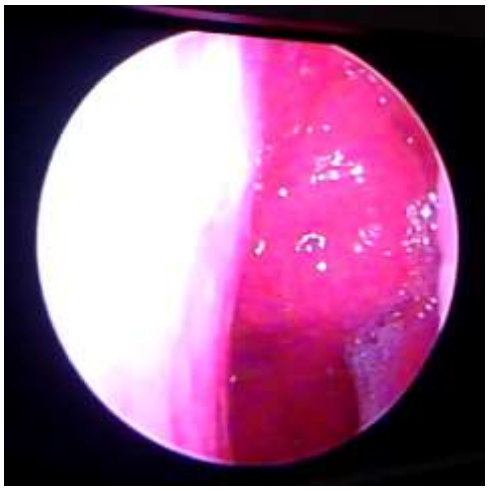

Fig. 3 Adenoid hypertrophy

Fig. 4 Polyp in nasal cavity

Fig. 5 Mouth breathing in a child with adenoid hypertrophy

Altogether 30 patients were advised radiological investigations like X- rays of para nasal sinuses , lateral view X-rays of nasopharynx and CT scans of nose and paranasal sinuses, of whom 10 did not reveal any significant finding, 8 revealed adenoid hypertrophy , 3 showed haziness in paranasal sinuses and nasal cavity and 9 showed sino nasal mass.

Discussion

The use of nasal endoscopy in children for diagnostic purposes as an outdoor procedure not only minimizes radiation exposure but gives better findings and results. Apart from the findings, a firsthand understanding of the anatomy and the variations provides for better planning of treatment options in the child, which are otherwise overlooked in isolated radiological investigations. Various previous studies have on different occasions brought to light the damaging effects of radiation; more so on children since radiation are known to have worse effects on rapidly dividing cells. Lack of or improper dose adjustment in children further accentuates the risk, notable being bone marrow damage, brain tumour and other non –stochastic effects.

Furthermore, symptoms of nasal discharge, obstruction and bleed often reveal no findings on radiology. Diagnostic nasal endoscopy as a first line investigation not only provides for visualisation of findings which would otherwise be missed on radiology, but also helps to cut treatment costs accelerating the diagnosis. Moreover, easy follow up can be done in patients to gauge the response to treatment which will otherwise be difficult radiologically. Diagnostic nasal endoscopy as an outdoor procedure provides a safe, easy, cheap and more importantly a better alternative to the conventional use of radiology in children. In our study, the common findings of bleed, rhinosinusitis, adenoid hypertrophy were often overlooked in radiology. In earlier studies, a study on assessment of adenoid size-a comparison of lateral radiographic measurement , radiological assessment and nasal endoscopy (Lertsburapa K. ,Schroeder J.W. Jr. , Sullivan.C)[1] found that radiologist's interpretation do not correlate well with intraoperative mirror examination finding. A retrospective study by Pagella F. [2]*et al.*(1999 to 2010) found nasal endoscopy a reliable , safe , accurate and easily tolerated procedure in children. Another study conducted by Ding H., Zhang X. , Liu W. , Zuo J.[3] reported nasal endoscopy as an excellent tool for diagnosis and management of epistaxis. A study by Abdel Aziz M.[4] found that endoscopic nasopharyngeal exploration at the end of conventional curettage adenoidectomy reduces the recurrence rates. Study on rigid nasal endoscopy in rhinosinusitis with adenoiditis in asthmatic children revealed purulent rhinosinusitis in 61 , and adenoiditis in 45 in total patients of 128(Ameli F. *Et al* .[5]). Al Mazrou et al [6] also reported using endoscopy for following up post-adenoidectomy patients. Caimmi D. et al. [7] also found nasal endoscopy of use in cases of nasal polyposis. Endoscopy was found useful for evaluating adenoid response to mometasone. (Bitar MA [8]) . Nasal endoscopy can also be brought into function to diagnose cause of nasal obstruction in newborns[9] and grading of adenoid hypertrophy [10]. Marseglia GL et al. [11] reported nasal

endoscopy useful in establishing a correlation between adenoid hypertrophy and serous otitis media. Kindermann CA et al. [12] found its use in establishing diagnosis of adenoid hypertrophy.

Conclusion

Nasal endoscopy in children for diagnostic purpose is a standard, easy, informative and more reliable procedure for diagnosing various sino-nasal conditions in children. While radiological investigations provide limited information and are expensive, nasal endoscopy is cost-effective and more informative. In our study, the information obtained by endoscopy was found to be more reliable for diagnosis and planning of surgery

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