

EVALUATION OF STRIDOR AND ABNORMAL CRY IN INFANTS

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ABSTRACT

INTRODUCTION

Turbulent flow due to partial obstruction of the airway gives rise to abnormal or unwanted noise. Noise originating in the larynx or trachea is typically high-pitched and termed 'stridor'. Laryngomalacia is the most common congenital cause of stridor in infants. In this study, we have analysed the cases of stridor and abnormal cry in infants that have presented to our institute over a span of one year.

AIM

To identify the causes of stridor and abnormal cry in infants presenting to our institute.

MATERIALS AND METHODS

This is a retrospective study of 50 cases of stridor and abnormal cry in infants that presented at a Tertiary Care ENT Hospital in South India from Jan 2015 to Dec 2015. Children below the age of 12 months that presented to our department with stridor and abnormal cry were included in our study.

RESULTS

The cases were evaluated in terms of Age, Sex ratio, Aetiology and Presenting features and statistically analysed.

CONCLUSION

The sheer volume of paediatric cases presenting with airway problems and other disease entities necessitates the need for establishment of a dedicated Paediatric ENT wing in every Tertiary Care Hospital.

KEYWORDS

Stridor in Infants, Abnormal Cry in Infants, Paediatric Stridor, Direct Laryngoscopy, Laryngomalacia, Bilateral Abductor Palsy.

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INTRODUCTION: Turbulent flow due to partial obstruction of the airway gives rise to abnormal or unwanted noise. Noise originating in the larynx or trachea is typically high-pitched and termed 'stridor'. Laryngomalacia is characterised by partial or complete collapse of the supraglottic structures on inspiration. It is the most common congenital cause of stridor in infants. Diagnosing paediatric airway problems is a challenging task to the caregivers. In this study, we have analysed the cases of stridor and abnormal cry in infants that have presented to our institute over a span of one year.

AIMS: To identify the causes of stridor and abnormal cry in infants presenting to our institute.

MATERIALS AND METHODS: This is a retrospective study of 50 cases of stridor and abnormal cry in infants that presented at a Tertiary Care ENT Hospital in South India from Jan 2015 to Dec 2015. All the cases were admitted and subjected to direct laryngoscopy to identify the aetiology and they are treated accordingly.

Children below the age of 12 months that presented to our department with stridor and abnormal cry were included in our study. In all the cases, the children were given Sevoflurane inhalational anaesthesia and Inj. Atropine intravenously, larynx was exposed with a paediatric Macintosh laryngoscope and further detailed examination of the larynx was done with a zero-degree nasal endoscope as shown in Fig-1. The mobility of vocal cords and other abnormalities are visualised and noted in a pre-prepared format. The examination was recorded in each and every case and the data stored for analysis at a later date. Majority

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of the cases were discharged within 24 hours except a few that needed dedicated paediatric nursing care were referred to a tertiary paediatric center in our area.

RESULTS: Of the 50 cases of stridor and abnormal cry in infants that presented to our institute, 28 cases were male and 22 cases were female infants {Male: Female = 1.3:1}, {Fig-2}. The age of presentation was 0-30 days in 6 infants, 1-4 months in 27 infants, 5-8 months in 9 infants and 9-12 months in 8 infants {Fig-3}. Clinical presentation was Stridor/Noisy breathing in 37 infants, respiratory distress in 13 infants, Weak cry in 10 infants and Regurgitation of feeds in 6 infants {Fig-4}. Of the 50 cases, Laryngomalacia was found in 32 cases, B/I Abductor palsy was found in 3 cases, Laryngeal web was found in 2 cases and Normal findings in 13 cases {Fig-5}.



Fig. 1: Showing Position of the Infant and Surgeon

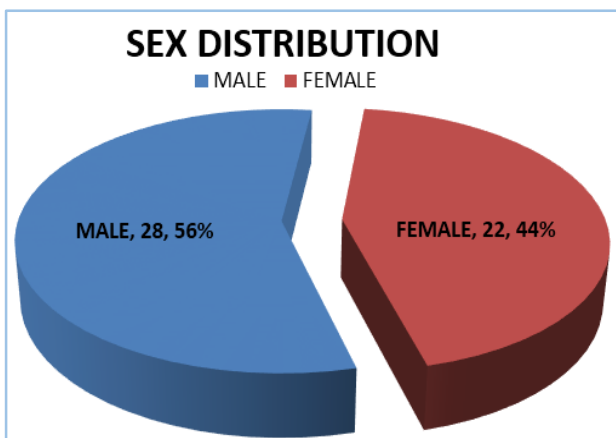


Fig. 2: Showing Sex Distribution

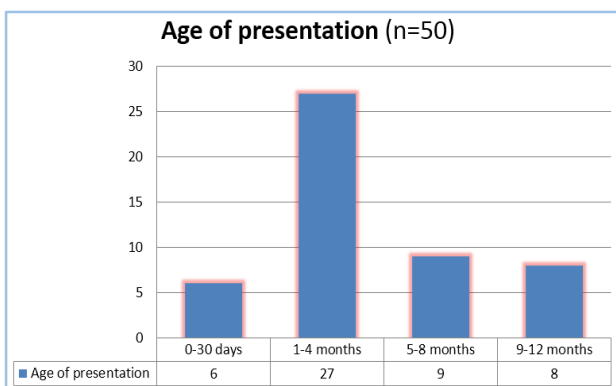


Fig. 3: Showing Age of Presentation

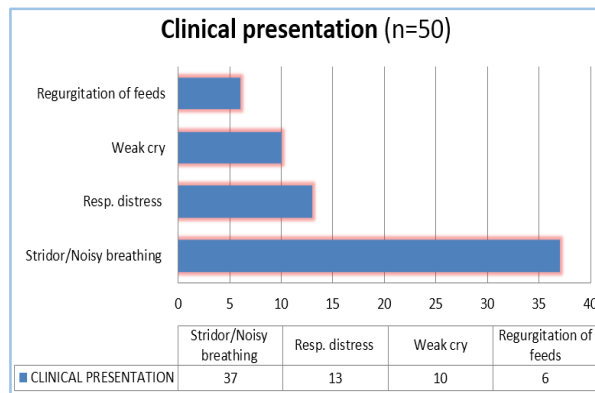


Fig. 4: Showing Clinical Presentation

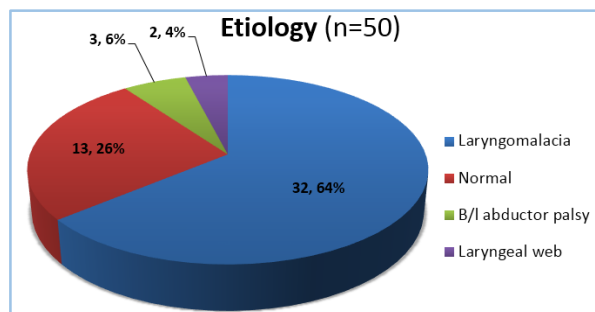


Fig. 5: Showing Etiology



Fig. 6: Showing Normal Larynx and Laryngomalacia

DISCUSSION: Laryngomalacia is the most common cause of stridor in infants and the most common congenital anomaly of the larynx. It affects 50% to 75% of infants with stridor.^{1,2} The aetiology of laryngomalacia is likely multifactorial, with anatomic, inflammatory, and neurological factors all contributing to the disease process.³ The stridor is typically worse with agitation, crying, feeding, and supine positioning. In addition to stridor, patients with laryngomalacia can have feeding difficulty, failure to thrive, dysphagia, aspiration, apnoea, cyanosis, reflux, obstructive sleep apnoea, and pulmonary hypertension in severe cases.⁴

The diagnosis of laryngomalacia is typically made with flexible fibre optic laryngoscopy. Findings include collapse of the supraglottic structures during inspiration, leading to inspiratory stridor and airway obstruction as shown in Fig-6. Common endoscopic features include inspiratory prolapse of the arytenoid cartilages, redundant arytenoid mucosa, shortened aryepiglottic folds, and an omega shaped or tubular epiglottis.⁵ Patients typically present with inspiratory stridor during the first few weeks of life, which usually worsens over the first 6 months of life and peaks in severity at about 6 months of age, followed by gradual improvement in the symptoms, with most patients being symptom free by age 18 to 24 months.⁶

Treatment of laryngomalacia has evolved over the years from a conservative approach awaiting resolution to a myriad of surgical options.⁷ Surgical treatment is indicated when the obstruction compromises ventilation to the extent that it causes failure to thrive, which occurs in a minority of cases.^{8,9} Gastroesophageal reflux disease (GERD) is a well-established comorbidity of laryngomalacia, and many patients with laryngomalacia have symptoms of and are treated for reflux.¹⁰

Vocal cord paralysis is the second most common cause of stridor in the neonate, following laryngomalacia. While unilateral paralysis occurs more frequently, bilateral paralysis can present with more severe symptomatology, most notably high-pitched inspiratory stridor and respiratory distress. Infants often require immediate intubation and eventual tracheotomy.¹¹ Normally, the diagnosis of bilateral paralysis is earlier than of unilateral paralysis owing to the more exuberant symptomatology of these patients. Considering bilateral paralysis, the main causes are neurological, idiopathic and birth trauma.¹²

Majority of bilateral true vocal paralysis cases can be attributed to structural abnormalities of the central nervous system, such as Arnold-Chiari malformation, meningomyelocele, and meningocele.¹³ Cardiothoracic or oesophageal surgeries can also be complicated by injury to the recurrent laryngeal nerves, either by stretch injury or lysis.¹³ In a study by Hamid Daya et al¹² in 2000 at London, it was found that Cardiac surgery was the most common of Iatrogenic Causes of bilateral paralysis, the closure of a Patent Ductus Arteriosus was the most common cause. Similarly, in our study, the two of the three cases of B/l vocal cord palsy were operated for tracheo-esophageal fistula repair along with ventricular septal defect repair.

Hence, we suggest the examination of larynx before and after major thoracic surgeries in paediatric population to allow early diagnosis and intervention as early as possible in cases of vocal fold paralysis. We have encountered two cases of Laryngeal webs one in the glottis area and the other in subglottis. Both the cases have history of prolonged intubation in intensive care units due to the need for mechanical ventilatory support. This observation stresses the need for prevention of prolonged intubation and to look forward for other airway maintenance measures. A considerable proportion of cases in our study had a normal functioning larynx on examination. This finding stresses the point that the child should be stabilised first and examined well by direct endoscopy before jumping to preformed diagnoses and before performing drastic airway procedures that cause more harm than good.

The sheer volume of paediatric cases presenting with airway problems and other disease entities, necessitates the need for establishment of a dedicated Paediatric ENT wing in every Tertiary care hospital. It is also desirable to have a well-trained and dedicated ENT anaesthesia team at our disposal. This study is an attempt to analyse the cases of stridor and abnormal cry in infants in our institute in a period of one year, we plan to continue the study further and

present a more detailed analysis on more number of subjects in the future.

CONCLUSION: It is the author's strong opinion that the sheer volume of paediatric cases presenting with airway problems and other disease entities, necessitates the need for establishment of a dedicated Paediatric ENT wing in every Tertiary Care Hospital.

It is also desirable to have a well-trained and dedicated ENT anaesthesia team at our disposal. It is our strong intention that the time is ripe for the major teaching institutions in India to explore the possibilities of offering Paediatric ENT Fellowship Programmes for the young ENT surgeons of our country.

REFERENCES

1. Cotton RT, Richardson MA. Congenital laryngeal anomalies. *Otolaryngol Clin North Am* 1982;14:203-218.
2. Holinger LD. Etiology of stridor in the neonate, infant and child. *Ann Otol Rhinol Laryngol* 1980;89(5 Pt 1):397-400.
3. Holinger LD, Konior RJ. Surgical management of severe laryngomalacia. *Laryngoscope* 1989;99(2):136-142.
4. Thompson DM. Abnormal sensorimotor integrative function of the larynx in congenital laryngomalacia: a new theory of etiology. *Laryngoscope* 2007;117(6 Pt 2 suppl 114):1-33.
5. Shah UK, Wetmore RF. Laryngomalacia: a proposed classification form. *Int J Pediatr Otorhinolaryngol* 1998;46(1-2):21-26.
6. Holinger P, Brown W. Congenital webs, cysts, laryngoceles, and other anomalies of the larynx. *Ann Otol Rhinol Laryngol* 1967;76(4):744-752.
7. Raylene Dias, Chandahas T Deshmukh, Milind S Tullu, et al. Rare treatment option for a common pediatric airway problem. *Indian J Crit Care Med* 2015;19(11):681-683.
8. Awan S, Saleheen D, Ahmad Z. Laryngomalacia: an atypical case and review of the literature. *Ear Nose Throat J* 2004;83(5):334,336-338.
9. Zalzal GH, Anon JB, Cotton RT. Epiglottoplasty for the treatment of laryngomalacia. *Ann Otol Rhinol Laryngol* 1987;96(1 Pt 1):72-76.
10. Olney DR, Greinwald HJ, Smith RJ, et al. Laryngomalacia and its treatment. *Laryngoscope* 1999;109(11):1770-1775.
11. Thomas T Tarin, Julian A Martinez, Nina L Shapiro. Familial bilateral abductor vocal cord paralysis. *International Journal of Pediatric Otorhinolaryngology* 2006;69(12):1693-1696.
12. Daya H, Hosni A, Bejar-Solar I, et al. Pediatric vocal fold paralysis. *Arch Otolaryngol Head Neck Surg* 2000;126(1):21-25.
13. Wang RC, Miller RH. Hoarseness and vocal cord paralysis. In: Calhoun KH, ed. *Head & neck surgery: otolaryngology*. Lippincott Williams & Wilkins, Philadelphia 2001;3rd edn:611-613.