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Original Research Article

A study on paediatric stridor causes and management: case series

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ABSTRACT

Background: Stridor is one of the life threatening symptoms presenting to the Emergency Department. Stridor is a sign of airway obstruction, so it demands immediate attention and thorough evaluation to uncover the precise underlying cause. This study on paediatric stridor is to find the causes of stridor in paediatric age group are to identify the cause to initiate treatment of stridor, suggest an approach to evaluate and manage the underlying cause.
Methods: Retrospective study of series 515 cases in paediatric age group**,** below 12 years of age presenting with respiratory distress to the Emergency department/ENT department. The primary management was to maintain the airway in all cases. Intravenous line established intravenous fluid/antibiotics /steroids/racemic adrenaline, followed by history of the respiratory distress from the parents/ caretakers. Then according to the provisional diagnosis evaluation is done by radiological investigation/ endoscopy.
Results: Laryngomalacia was the most common cause of infant stridor in less than one year of age in 348 cases, while Foreign body aspiration is the most common cause of stridor in age group one to 12 years in 122 cases. 358 cases (69%) were treated conservatively and cause related management was done in 157 (31%). Endoscopy and imaging offers the best methods in evaluating and treatment of pediatric stridor.
Conclusions: The management of stridor in pediatric age group is a team work of ENT surgeons, Pediatrician, Pediatric surgeons, anaesthetist. The airway maintenance is the main management followed by ENT examination, evaluation by imaging, endoscopy and treatment of the cause. We follow the airway management algorithm in order to evaluate the child for diagnosis of the cause for treatment and successful outcomes of stridulous pediatric patients.

Keywords: Paediatric, Stridor, Aetiology, Management

INTRODUCTION

Stridor is one of the life threatening symptoms presenting to the Emergency Department.[1] The word stridor is derived from the Latin word "Stridulus", which means creaking, whistling or grating. Stridor is harsh, vibratory sound of variable pitch caused by partial obstruction of the respiratory passages that results in turbulent airflow through the airway. Stridor is a sign of airway obstruction, so it demands immediate attention and thorough evaluation to uncover the precise underlying cause.[2] This study on paediatric stridor is to suggest an approach to evaluate and manage the underlying cause.

Aims of the study

1. To find the causes of stridor in paediatric age group of newborn –to 12 years.
2. Early identification of the cause to initiate treatment of stridor.

METHODS

A retrospective study of 515 cases, between March 2013-March 2014, done at Department of ENT, Institute of Child Health, Madras Medical College, Chennai of paediatric age group patients, below 12 years of age presenting with respiratory distress to the Emergency department/ ENT department.

The primary management was to maintain the airway in all cases by intubation if respiratory distress is severe, intravenous line established, intravenous fluid /antibiotics/steroids/racemic adrenaline, followed by history of the respiratory distress from the parents/ caretakers. Then according to the provisional diagnosis evaluation is done with X-ray neck ap/lateral with chest/computerised tomography/magnetic resonance imaging. The various scopy performed are direct laryngoscopy/ flexible bronchoscopy/rigid bronchoscopy/ oesophagoscopy. Tracheostomy was performed in few cases to bypass airway obstruction. Definitive treatment was instituted according to the diagnosis.

Inclusion criteria

Inclusion criteria were age group of newborn up to 12 years; history of respiratory distress due to structural anomaly of respiratory tract intra luminal/extra luminal pathology, patients of acquired pathology of airway causing respiratory distress.

Exclusion criteria

Respiratory distress due to medical diseases like asthma, cardiac, haematological causes.

RESULTS

Table 1: Causes for stridor in children less than one year.

	No. of cases
Laryngomalacia	348
Choanal atresia	5
Subglottic web	2
Cystic hygroma	2
Cyst floor of tongue	1
Cellulitis neck	1
Tracheo oesophageal fistula	1
Pierre-Robin syndrome	1
Total	361

The number of cases enrolled for study was 515 cases. Laryngomalacia was the most common cause of infant stridor in less than one year of age in 348 cases followed by choanal atresia in 5 cases (Figure 12). Foreignbody aspiration is the most common cause of stridor in age group one to 12 years in 122 cases The next common causes were Recurrent laryngeal papillomatosis, Acute-Laryngo tracheobronchitis each 7 cases (Figure 13). 358 cases (69%) were treated conservatively and cause related management was done in 157 (31%) (Figure 14). Endoscopy and imaging offers the best methods in evaluating and treatment of pediatric stridor.

Table 2: Causes for stridor in children of 1-12 years.

Causes	No. of cases
Foreign body Bronchus	122
Recurrent laryngeal papillomatosis	7
Laryngo-tracheo bronchitis	7
Acute epiglottitis	2
B/L Vocal cord palsy	2
Retropharyngeal abscess	2
Foreign body cricopharynx	2
Subglottic haemangioma	1
Diphtheria	1
Epiglottic cyst	1
Innominate vessel compression	1
Pseudo-aneurysm arch of aorta	1
Total	154

Table 3: Management of causes for stridor.

Causes	Treatment
Laryngomalacia, Acute epiglottitis, Laryngo-tracheo bronchitis, Cellulitis neck	Conservative management
Choanal atresia	Serial dilatation
Subglottic web, Pierre Robin syndrome,B/L Vocal cord palsy	Tracheostomy
Cystic hygoma	Debulking and local bleomycin injection
Cyst floor of mouth, Epiglottis cyst	Marsupilisation
Trachea –oesophageal fistula	Trachea-oesophageal fistula repair
Foreign body bronchus	Rigid bronchoscopy and foreign body removal
Recurrent laryngeal papillomatosis	Micro laryngeal excision
Retropharyngeal abscess	Incision and drainage
Foreign body cricopharynx	Oesophagoscopy and foreign body removal
Diphtheria	Intubation and Anti –diptheric toxoid
Pseudo- aneurysm arch of aorta	Repair by cardio pulmonary bypass

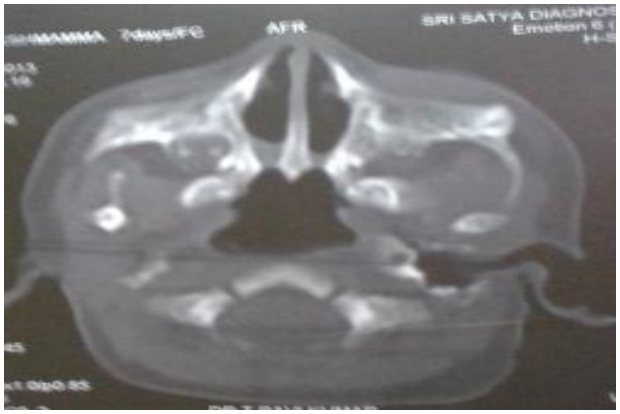

Figure 1: Bilateral choanal atresia.

Figure 2: Retropharyngeal abscess.

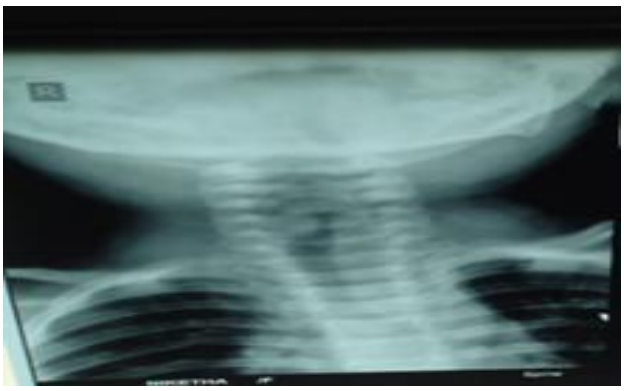

Figure 3: Laryngo tracheo bronchitis.

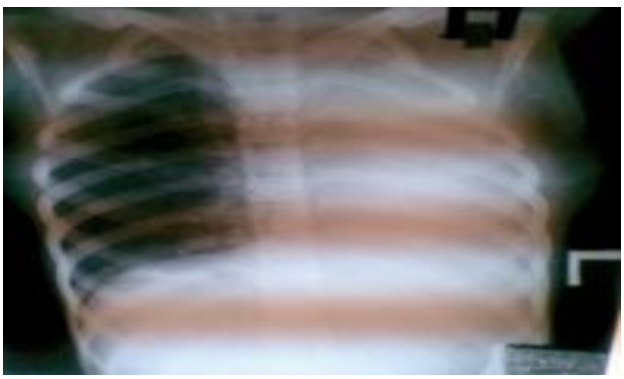

Figure 4: Left lung collapse - foreign body.

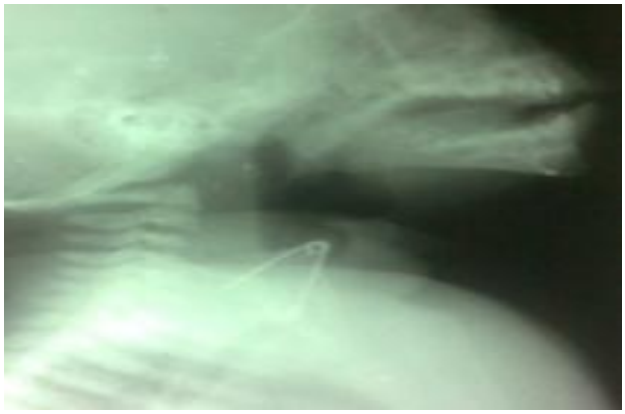

Figure 5: Safety pin cricopharynx.

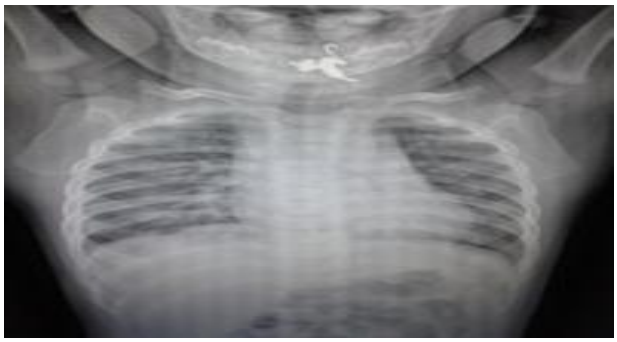

Figure 6: Ear stud cricopharynx.

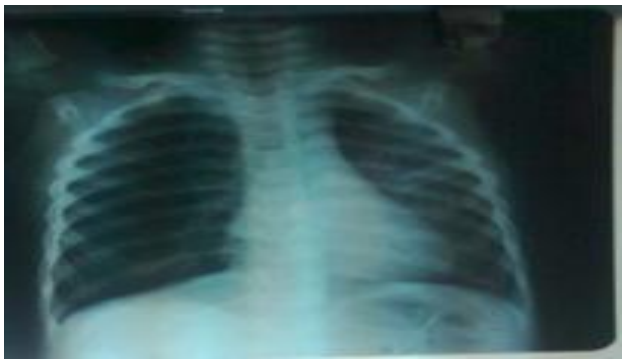

Figure 7: Right lung hyperinflation-foreign body bronchus.

Figure 8: Cystic hygroma.

Figure 9: Cellulitis floor of mouth.

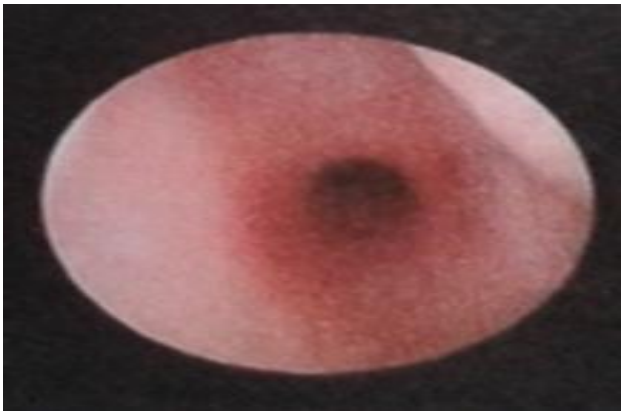

Figure 11: Subglottic stenosis.

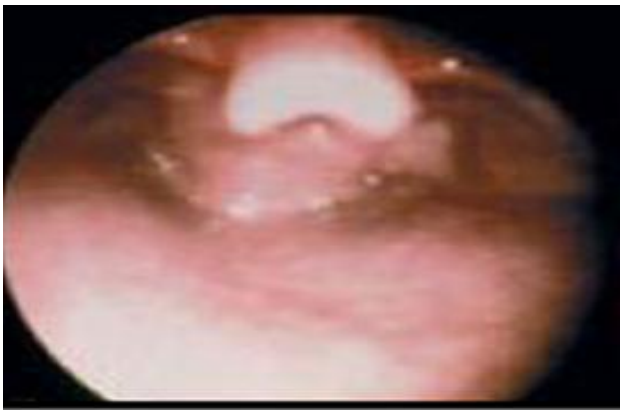

Figure 10: Laryngomalacia.

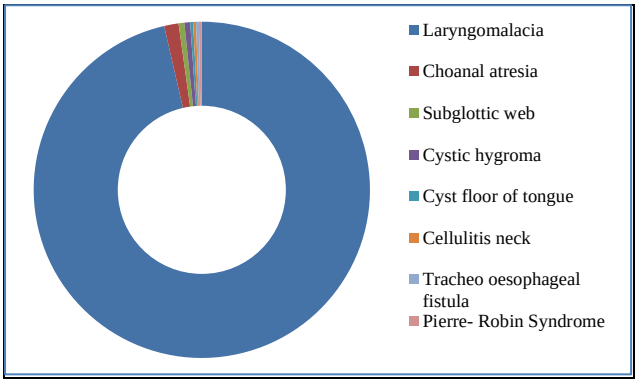

Figure 12: Causes for stridor in children less than one year.

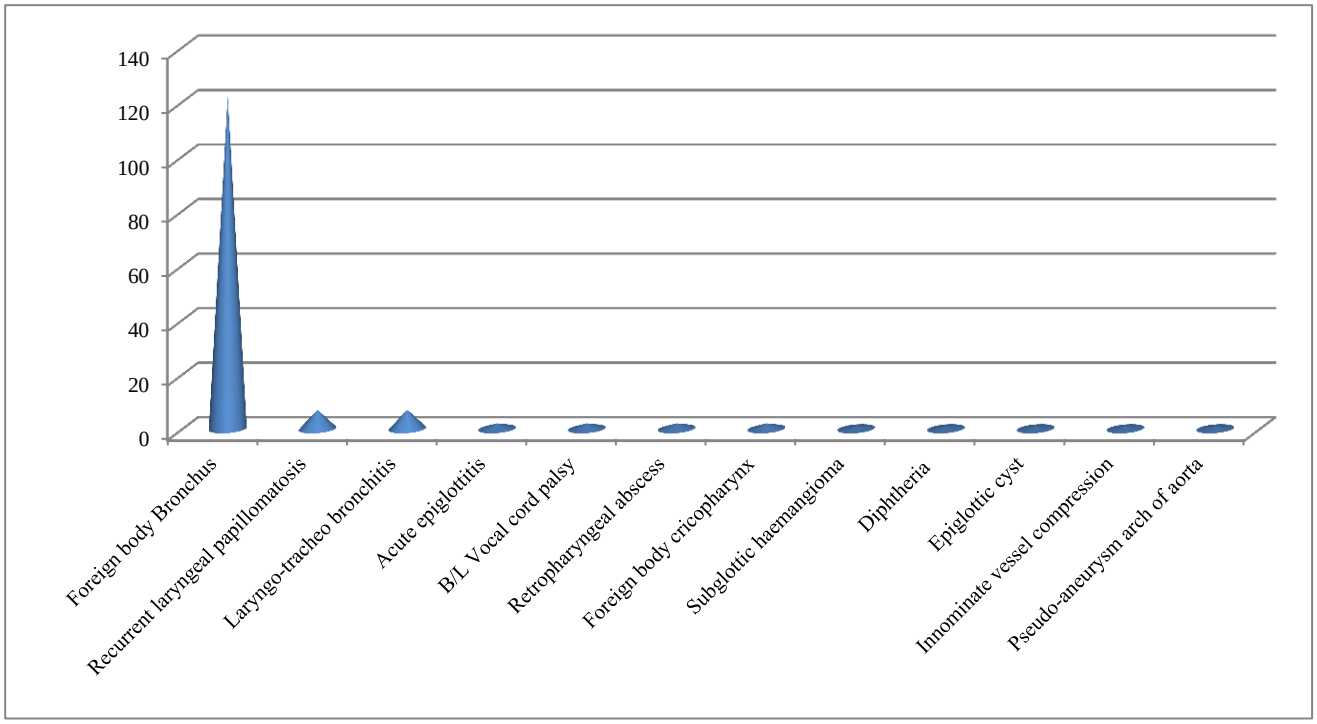

Figure 13: Causes for stridor in children of one year to 12 years.

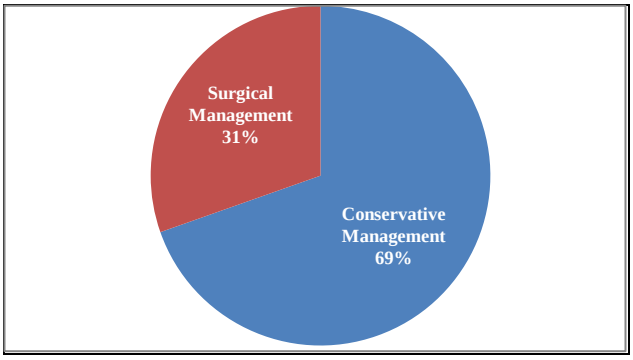

Figure 14: Management of stridulous child.

DISCUSSION

Stridor is a distressing symptom to the patients and their parents present a diagnostic challenge to the treating physician. Rapidly assessing the patients with respiratory distress and those in significant distress should be managed emergently. We observed 70% of children in our study were aged below1 year of age showing that the stridor and respiratory distress are more frequent in this age group as also reported by other authors (Table 1) similar to our study.[4-7] Stridor in very young infants is most often due to laryngomalacia, which is consistent with our study where 348 cases of infants were diagnosed with laryngomalacia.[3] Foreign bodies in the airway are another source of stridor and one study found seeds to be the most commonly aspirated object Table 2.[8] This result is similar to our study where 122 cases of bronchial foreign body was diagnosed. We encountered 2 sharp radio-opaque Hypopharynx which was impinging on the airway.

In investigations X-ray neck AP/Lateral and X- ray chest was done in all cases. Advanced imaging was done for space occupying lesions.[9] If a subglottic hemangioma is suspected, a CT or MRI should be performed, may reveal asymmetric narrowing of trachea, sometimes CT angiogram or MRI angiogram to confirm diagnosis for vascular abnormality/abscess consistent to our study.[10]

Direct laryngoscopy/flexible bronchoscopy are performed without sedation, while rigid bronchoscopy/oesophago-scopy are performed under anaesthesia. Tracheostomy was performed in few cases to bypass airway obstruction. If the scopy study is normal then we need to evaluate extra luminal compression of the airway and imaging studies are done to find out the cause. Definitive treatment was instituted according to the diagnosis. There were no mortality in our study.

CONCLUSION

The management of stridor in pediatric age group is a team work of ENT surgeons, pediatrician, pediatric surgeons, anaesthetist. The airway maintenance is the main management followed by ENT examination, evaluation by imaging, endoscopy and treatment of the cause. We follow the airway management algorithm in order to evaluate the child for diagnosis of the cause for treatment and successful outcomes of stidulous pediatric patients.

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Ethical approval: Not required

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