



## A Study of Etiology and Management of Stridor

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### Introduction

Stridor is defined as high pitched noise generated due to turbulent flow of air through a partial obstruction of the airway in larynx or trachea.<sup>1</sup>

Stridor is one of the life threatening symptoms presenting to the Emergency Department. Its presence indicates an obstruction of the airway. Stridor is a manifestation of foreign body obstruction, severe anaphylaxis and infections such as viral croup, acute epiglottitis and acute tracheitis.<sup>2,3</sup>

It is more common in males than females and about 15% of patients have a strong family history of croup. Epiglottitis was once one of the most common infectious causes of upper airway obstruction but now occurs much less frequently. It affects approximately 1.3 out of every 100,000 children per year.<sup>4</sup>

Foreign body aspiration is the most common non-infectious cause of upper airway obstruction which may or may not result in stridor, and causes the deaths of more than 150 children per year.<sup>5</sup>

Laryngomalacia and tracheomalacia are the most prevalent causes of congenital stridor, accounting for 60% of cases.<sup>6</sup>

Early detection of worsening stridor is important to avoid the patient from deteriorating further. Some symptoms such as drooling, agitation and tripod position in children are important warning signs that the airway obstruction is severe enough to compromise the ventilation of the child.<sup>7</sup>

### Signs and symptoms associated with stridor in adults:

**Symptoms:** difficulty in breathing (dyspnea) and swallowing change in voice, neck swelling, cough, pain in throat.

**Signs:** use of accessory muscles while respiration, swelling of lips and tongue in anaphylaxis reaction /acid dye ingestion/thermal burn, floor of mouth raised, tripod position etc.

Stridor may be heard during inspiration, expiration or both.

**Inspiratory** stridor is often produced in obstructive lesions of supraglottis or pharynx e.g. laryngomalacia or retropharyngeal abscess.

**Expiratory** stridor is produced in lesions of thoracic trachea, primary and secondary bronchi e.g. bronchial foreign body, tracheal stenosis.

**Biphasic** stridor is seen in lesions of glottis, subglottis and cervical trachea e.g. laryngeal papilloma, vocal cord paralysis and subglottic stenosis.<sup>11</sup>

### Common causes of stridor in adults

Trauma to neck- (RTA, strangulation), tumors of larynx, ludwigs angina, parapharyngeal abscess, vocal cord paralysis, thyroid malignancy, thermal burns, acid dye ingestion, tetanus.

In India an other developing countries the prevailing lower SES, smoking and drinking habits, poor general health of population, environmental and different social customs definitely increase the incidence of stridor.

Stridor should be differentiated from **stertor** which is a low pitched snoring type sound generated at the level of nasopharynx and oropharynx .

### Materials & Methods

The study entitled to “**A Study of Etiology and Management of Stridor**” conducted in the department of otorhinolaryngology & head and neck surgery in government hospital for a period of 1 year from January 2018 to December 2018. A total of 100 cases presenting with STRIDOR in the ENT emergency were taken for study.

### Inclusion Criteria

- All patients presenting with stridor at ENT emergency, paediatrics ward, medicine and surgery ICU.

### Exclusion Criteria

- Patients with snoring, nasal obstructive diseases.

### Results

**Table No. 1:** Incidence of stridor in Different Age Groups

Age group (years)	No. of cases	Percentage
<1 year	16	16%
1-5 year	26	26%
6-10 year	10	10%
11-15 year	-	-
16-20 year	05	05%
21-25 year	05	05%
26-30 year	04	04%
31-35 year	02	02%
36-40 year	06	06%
41-45 year	03	03%
46-50 year	04	04%
51-55 year	05	05%
56-60 year	04	04%
61-65 year	03	03%
66-70 year	04	04%
71-75 year	01	01%
76-80 year	01	01%
81-85 year	-	-
86-90 year	01	01%
>90 year	-	-
TOTAL	100	100%

In the present table, the peak incidence of stridor was found in the age group between 1 -5 years (26%) followed by <1 year (16%)

**Table No. 2:** Sex wise distribution of patients

Sex	No. of cases	Percentage
Male	64	64%
Female	36	36%
Total	100	100%

The incidence of stridor was observed to be more in males (64%) than females (36%).

**Table No. 3:** Types of stridor

Type of stridor	No. of Cases	Percentage
Inspiratory	66	66%
Expiratory	22	22%
Biphasic	12	12%
Total	100	100%

Most common type of stridor is inspiratory 66% followed by expiratory 22% least common is biphasic 12%.

**Table No. 4:** Duration of stridor

Time Period	No. of Cases	Percentage
<1 Wk	72	72%
1-12Wks	23	23%
3 Months – 6 Months	04	04 %
>6 Months	01	01 %
Total	100	100%

In our study 72% patients were having stridor for duration <1 week, 23% patients were having stridor for duration 1-12 weeks, 4% patients were having stridor for duration 3 months to 6 months, only 1% patients were having stridor for duration >6 months.

**Table No. 5:** Clinical presentation of patients with stridor

Clinical presentation	No. of cases	Percentage
Noisy breathing	100	100%
Difficulty in breathing	90	90%
Difficulty in swallowing	46	46%
Change in voice	40	40%
Swelling in neck	30	30%
Pain in throat	21	21%
Cough	70	70%
Fever	40	40%
Hoarseness of voice	30	30%
Cry –abnormal	10	10%

In our study noisy breathing 100% was the most common associated complain followed by 90% difficulty in breathing and least common associated complaint was abnormal cry(10%).

**Table No. 6:** Causes of stridor

Causes of stridor	No. of cases	Percentage
Foreign body bronchus	22	22
Laryngomalacia	10	10
Altb	07	07
Diphtheria	10	10
Epiglottitis	02	02
Growth larynx	20	20
Ludwigs angina	10	10
Larynx edema (burn & acid ingestion)	08	08
Larynx trauma	06	06
Ca thyroid	01	01
Tetanus	01	01
Vocal cord palsy	01	01
Retropharyngeal abscess	01	01
Parapharyngeal abscess	01	01

Among various causes of stridor foreign body bronchus was the most common cause of stridor 22%, followed by growth larynx 20%, and least common causes were vocal cord palsy 1%, Retropharyngeal abscess 1%, parapharyngeal abscess 1%, tetanus 1%, ca thyroid 1%.

**Table No. 7:** Treatment of stridor

Causes of stridor	MANAGEMENT
Foreign body bronchus	Bronchoscopy and foreign body removal
Laryngomalacia	Conservative
Diphtheria	Tracheostomy
ALTB	Medical management
Epiglottitis	Medical management
Retropharyngeal abscess	Incision and drainage
Growth larynx	Tracheostomy and direct laryngoscopy and biopsy
Ludwigs angina	Incision and drainage, tracheostomy
Larynx edema	Tracheostomy
Larynx trauma	Tracheostomy

In our study Tracheostomy done in 50%, bronchoscopy and foreign body removal in 22%, Direct laryngoscopy and biopsy taken in 20%, incision and drainage 12%, conservative management 10%, medical management 9%

**Discussion**

The present study entitled “A Study of Etiology and Management of Stridor” at Government Hospital. Study period from January 2018 to December 2018 on 100 patients with stridor.

**Age Distribution**

In our study it was observed that most of the patient belong to age group 1-5 years (26%) followed by <1 year 16%, 6-10 year 10%.

Overall age distribution: newborn-10 year age is 52%.

**On comparison with the following studies:**

1. In study done by Selvam DK et al (2017)<sup>50</sup>

Total patients 515

In their study the maximum patient were below 1 year i.e. 70% ( and B/W 1-12 year of age is 30%.

It is not matching with our study because we included all the patients upto adults.:

In their study maximum cases are of laryngomalacia (97%) in <1 year age group.

Paediatric patients is 52% in our study and sample size is also small in our study.

2. Sugany.C, Nathiya.S, S.Ramesh (2017)<sup>52</sup>

In their study majority of cases are in the age group <1 year 62% followed by

4-12(24%) and then 1-4 year (14%).

### Sex Distribution

Out of 100 patients 64% male and 36% female. male: female ratio is 1.7:1.also found that stridor was more common in males. The variation in ratio could be due to different population size. Male predominance could also be explained because of different habits eg. Smoking, chewing tobacco, alcohol intake which is not common in females in our locality. Males are also exposed to occupational hazards, while females mostly lead indoor life.

### In accordance with the following studies:

- 1.Waalkens HJ et al(1989)<sup>51</sup> in their study 80% male and 20% female.
2. **Suganya C et al (2017)**<sup>52</sup> in their study 70 % male and 30% female. This a study is match to our study.
- 3.Rupa v. raman (1990)<sup>53</sup> in this study 65.5% male and 35.5% female. results are similar in our study.

### Duration of Stridor

In our study 72% patients were having stridor for duration <1 week followed by 23% patients having stridor for duration 1-12 week,4% patients having stridor for duration 3 months -6 months, only 1% having stridor for duration >6 months.

### In accordance with the following studies:

- 1.Suganya.C, Nathiya.S,S.Ramesh (2017)<sup>52</sup> 76% cases were present with stridor <1week followed by 24% cases were presented with chronic stridor.

### Types of Stridor

In our study most common type of stridor is inspiratory 66% followed by expiratory 22% and Biphasic 12%.

### On comparison with the following studies:

1. **Suganya C et al (2017)**<sup>52</sup> In this study most common type is Inspiratory stridor in 96% followed by biphasic stridor in 4% cases.

### Causes of Stridor

In our study causes of stridor in children (52 cases).congenital etiology of stridor is 19.2% and acquired is 67.8%.

In our study m.c. cause of stridor is foreign body bronchus between 1-12year age group 42% and m.c cause of infant stridor (<1 year) is laryngomalacia 19.2%.

Infectious disease ALTB 13.6% and diphtheria causing stridor in 19.2%, retropharyngeal abscess 1.9%,

### Adult patients (48 cases)

Most common is growth larynx 41.6% followed by ludwigs angina 20.8%, larynx edema 16.6%,larynx trauma 12.5%,vocal cord palsy 2.08%, ca thyroid 2.08%, tetanus 2.08%, epiglottitis 3.8%,parapharyngeal abscess 2.08%.

### In accordance with the following studies:

- 1.Rupa v., Raman R.(1991)<sup>53</sup> Congenital etiology is 32.2% and acquired in 67.8%.

In this study Laryngomlacia 19.4% was commonest congenital cause of stridor. ALTB 25% and diphtheria 10%causing stridor. Results are similar in our study. other causes in this study foreign body bronchus 6.7%, epioglottitis 0.5%,neck abscess 0.5%.

- 2.waalkens HJ et al(1989)<sup>51</sup>

In this study cause of stridor are larynx anomaly 32%, infectious disease causing stridor 34%.

3. In study done by **Selvam DK et al (2017)**<sup>50</sup>

In this study total case included is 515. In their study maximum patient were <1 year of age 1.e 70% followed by 1-12 year is 30%. In age group <1 year 97% were case of laryngomalcia. 1-12 year age group most common cause of stridor is foreign body bronchus 79%.

This study is not match with our study because in our study we got less cases of laryngomalacia because most probably they were under reported. The reason behind it is it does not cause any continous respiratory distress and parents ignorance because of lower SES and poor education status.

- 4.Vasileios zochios (2015)<sup>54</sup>

In this study total cases are 249 with 99 publications.

In this study commonest systemic cause of stridor is neurological 26% followed by psychogenic stridor in 21.2%, vocal cord disease 10.8%, esophageal and autoimmune 7.2%, primary airway lesion 6.8%, thyroid and parathyroid disease 5%, infectious, inflammatory and immunodeficiency 3.6%, exercise in elite athletes 7.6%, thoracic aortic aneurysm 1%.

In our study most common cause of stridor in adult is growth larynx 41.6% followed by ludwigs angina 20.8%, larynx edema 16.6%.

- This study is done in developed country (U.K.) So patient presents early and undergo early diagnosis and treatment. Where as in our country the patients remain undiagnosed till they develop respiratory distress, change in voice and other symptoms.
- Growth larynx is most common in our study because carcinoma larynx is more common in our country as compare to other countries. Carcinoma larynx is the ninth and seventh most common cause of cancer. in males in Asia and India respectively .
- India is another developing country prevailing lower SES, tobacco chewing, smoking and drinking habits, poor general health of population, environmental and different social customs definitely increase the incidence of carcinoma larynx.
- A higher incidence of growth larynx in our study could be explained by the fact that our medical college and hospital is only government medical college and hospital for a large population, with well equipped operation theatre and well functioning pathological laboratory where histopathology is available which helps in making diagnosis of carcinoma larynx .There is also separate oncology department in our medical college so patients are referred from surrounding areas.

### Management of Stridor

In our study Tracheostomy done in 50%, bronchoscopy and foreign body removal in 22%,

Direct laryngoscopy and biopsy taken in 20%, incision and drainage 12%, conservative management 10%, medical management 9%.

### In accordance with the following studies:-

1. Rupa v., Raman R. (1990)<sup>53</sup>

Tracheostomy was done in 25% of patients.

2. Waalkens HJ et al (1989)<sup>54</sup> Intubation and tracheostomy performed in 33.3% patients.

### Conclusion

The present study was undertaken to study etiology and management of stridor among the patients attending the Otorhinolaryngology, Head & Neck Surgery department in Government Hospital total of 100 patients were included in the study. stridor is a very severe airway obstruction which needs emergency management. Management of stridor can be a challenge. stridor for longer duration may be because of underlying malignancy so every patient with stridor should be investigated thoroughly and managed accordingly. Proper diagnosis through detailed history and examination is paramount.

Direct laryngoscopy and bronchoscopy proved to be useful method in detecting various causes of stridor and making a diagnosis. Biopsy should be taken from any growth or any suspicious area for the confirmation of diagnosis so that proper management can be given.

In our study most commonly affected age group with complains of stridor is 0-10 years (52%) with majority of them were males. M.C. cause of pediatric stridor foreign body bronchus followed by laryngomalacia and diphtheria. Since our study is a Government Institution based study and patients in the institution are more from low socio-economic strata, which are more prone to laryngeal infections and cancer larynx due to their poor nutrition, addiction habits and occupational exposure.

Benign and malignant lesions of larynx are more common in patients between 40-60 years of age group. Smoking is also a contributing factor causing persistent inflammation and irritation of the larynx.



**Management** of stridor is according to the cause of stridor.

Fb bronchus-bronchoscopy is done.

Growth larynx-tracheostomy followed by dlscopy and biopsy taken from growth and send for HPE.

Diphtheria, larynx trauma, larynx edema, vocal cord palsy, tetanus, ca thyroid-tracheostomy.

ALTB, epiglottitis-medical management.

Ludwigs angina-incision and drainage, tracheostomy.

Retropharyngeal and parapharyngeal abscess-incision and drainage.

Laryngomalacia-conservative management.

In our study Tracheostomy done in 50%, bronchoscopy and foreign body removal in 22%, Direct laryngoscopy and biopsy taken in 20%,incision and drainage 12%, conservative management 10%, medical management 9%.

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