



## A CASE SERIES OF CROUP IN STRIDOR IN A SEMI URBAN TEACHING HOSPITAL – SOUTH INDIA

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### ABSTRACT

Croup is a common cause of infectious etiology of acute stridor. A series of twenty eight cases seen over a period of two years have been described. The patients presented with acute onset of stridor, cough, respiratory distress and hoarseness of voice. Male children are more commonly affected. Radiographically positive findings in 8 cases and normal in 20 cases. Lab findings showed elevated leucocyte count in 24 cases. All cases were responded well with steroids and nebulised epinephrine. Complete Recovery in all twenty eight cases.

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### INTRODUCTION

Croup is one of the common pediatric respiratory illnesses, characterized by varying degrees of inspiratory stridor, barking cough, and hoarseness due to obstruction in the region of the larynx. Although most children with croup experience a mild and short-lived illness, significant upper airway obstruction, respiratory distress, and death can occur. Croup is one of the most common reasons for children to present to the Emergency Department (ED). The disease mainly affects children between 6 months and 3 years old. The symptoms of croup result from upper airway obstruction caused by an acute viral infection, most typically from the parainfluenza virus. Parainfluenza virus (types 1 to 3) is the most common etiology. Of the three types, parainfluenza type 1 is the most common. Although parainfluenza type 3 virus infections often occur in young children, croup develops in only a small percentage of those exposed other viruses that cause croup include enterovirus, human bocavirus, influenza A and B viruses, respiratory syncytial virus, rhinovirus, and adenovirus.

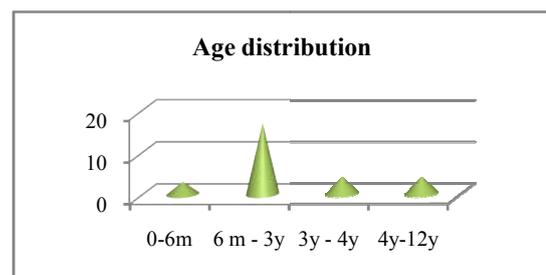
### MATERIALS AND METHODS

An observational study was performed in the year October 2014- September 2016. This study was conducted at

RMMCH, Chidambaram. All cases of acute stridor of pediatric age group 0-12 years were registered. Demographic data such as age and sex were included. Of these, Clinical characteristics including chief complaints of cough, stridor and hoarseness of voice for the initial visit, clinical course, and outcome of treatment were noted. Informed consent for study participation was carried out. In this study, post operative cases of stridor were excluded.

### RESULTS

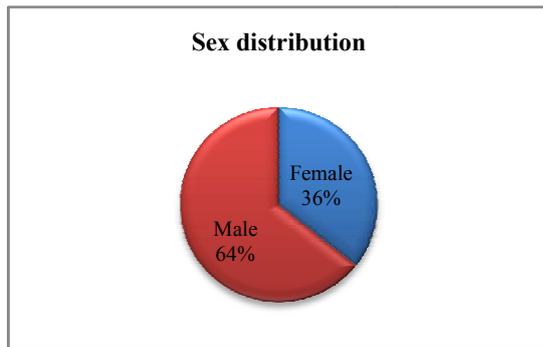
In this study, 50 children were presented with stridor. Out of them, 28 were found to have had croup. There were 3 cases in 0-6 months, 17 cases in 6 months -3 years, 4 cases in more than 3 years-4 years, 4 cases in more than 4 years -12 yrs.



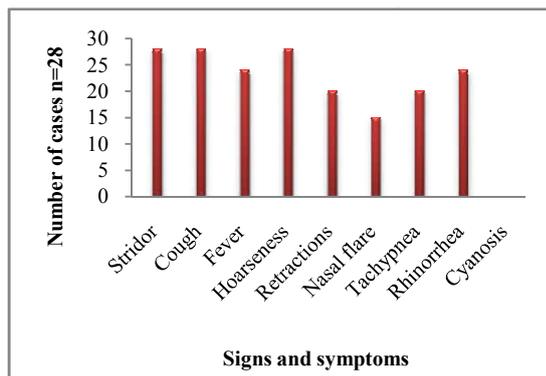
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The male: female (M:F) ratio was 1.8:1.



The median and mean ages were found to have 1 year 3 months and 2 years and 3 months respectively. The peak age group was 3 months to 6 years. In the current study, the incidence of croup gradually decreased with age in patients older than 3 years. The most common presenting complaints were noisy breathing, cough, fever, rhinorrhea, respiratory distress, hoarseness of voice and nasal flaring. All 28 children had the classical presentations of inspiratory stridor, cough and hoarseness of voice. 24 cases presented with fever, 24 cases presented with rhinorrhea, 20 cases presented with retractions, 20 cases had increased respiratory rate, 15 cases had nasal flaring. No cases were found to have cyanosis.



In this 96% of the cases had inspiratory stridor, 4% of the cases had biphasic stridor. In the current study, 24 (87.5%) cases had elevated White blood cell count. Lymphocytosis was observed in differential count. Radio imaging was done for all cases including chest and neck radiographs. Chest radiographs showed normal study in all cases. Neck radiographs including anteroposterior and lateral radiographs taken. Eight cases (28.5%) showed X-ray positivity of steeple sign. In this study, severity of croup was classified according to Westley croup score. Fifteen cases (54%) were classified under moderate severity and remaining 13 cases (46%) were classified under severe category. Moderate severity cases were treated with steroids. Seven cases out of 15 cases showed improvement in croup score at 18 hours of IM dexamethasone and 8 cases out of 15 cases showed improvement at 20 hours of nebulised budesonide. Severe croup cases were treated with steroids and nebulised epinephrine. 9 cases of severe category showed improvement with nebulised epinephrine in 30 minutes post treatment. They assessed every 1 hour for the duration of 6 hours. Marked improvement in croup score from baseline was observed after 6 hours. The remaining 4 cases were initially treated with systemic

steroids and also they were needed nebulised epinephrine in addition to steroids.

## DISCUSSION

In this study with classic signs and symptoms (i.e., abrupt onset of barking cough, hoarse voice, inspiratory stridor and, often, fever), the diagnosis of croup was straightforward and was done reliably and safely by use of the history and physical examination. Although far less than 1% of children with acute onset stridor have another diagnosis, the other differential diagnosis were ruled out. Bacterial tracheitis may result from a secondary infection and usually leads to a more toxic appearance, with higher fever and worse respiratory symptoms than croup. Bacterial tracheitis does not respond to usual croup treatment. Intravenous antibiotics are needed, and intubation may become necessary. Acute epiglottitis typically leads to a more toxic appearance than croup. The classic presentation of epiglottitis is an anxious child with a sore throat who is drooling and sitting or leaning forward; Immunization against *Haemophilus influenzae* type b has contributed to the decreased incidence of epiglottitis, and the early use of corticosteroids has decreased the incidence of respiratory distress in patients with croup. Other diagnoses to consider include foreign body aspiration, peritonsillar abscess, retropharyngeal abscess, and angioedema. In this study the diagnosis of croup was mainly on history and physical examination. Roger Zoorab, Mohamed Sidani and John Murray *et al* supported this. There were 3 cases in 0-6 months, 17 cases in 6 months -3 years, 4 cases in more than 3 years-4 years, 4 cases in more than 4 years -12 yrs. The male:female (M:F) ratio was 1.8:1. The median and mean ages were found to have 1 year 3 months and 2 years and 3 months respectively. The peak age group was 3 months to 6 years. Doo Ri Lee and Chang Hyu Lee *et al* conducted 146 children in Korea. They observed that the male:female (M:F) ratio was 1.9:1. The mean age was  $2.2 \pm 2.0$  years. The peak age group was 1 to 3 years. All cases of croup in this study had inspiratory stridor, brassy cough and hoarse voice. Knutson D & Aring A. *et al* observed the same.

Laboratory and imaging evaluation are not essential, but may be used to rule out other illnesses in selected patients with an atypical or severe presentation. In the present study two third of the cases showed elevated leucocytosis predominantly lymphocytic distribution, accounted for 87.5%. Hodge *et al* showed three fourth of ALTB cases had elevated White blood cell count.

Although chest radiography cannot diagnose croup, it can rule out other pulmonary conditions when the diagnosis is unclear in a child with stridor. If frontal radiography of the neck is performed, one may see narrowing of the subglottic space, often termed the steeple sign. However, the absence of this sign does not rule out croup. In the current study, 28.5% of cases showed typical findings of croup. Jaswal A, *et al* observed the same results. Clinical trials have adopted a variety of clinical scores as outcome measures, but these scores have shown a lack of reliability when used by a wide range of clinicians. However, elements of the clinical features in these scoring tools are

useful in estimating severity of croup. The severity of a child's symptoms at presentation can reliably guide management. Although there are no universally accepted standards for assessing disease severity, clinical scoring systems used for research all involve common signs. These include severity of chest wall indrawing, presence of stridor at rest or only with agitation, stridor only with inspiration or with both inspiration and expiration, cyanosis and lethargy. In practice, most clinicians characterize respiratory distress as mild, moderate, severe or impending respiratory failure. In the current study, westley croup score was used to assess the severity. Fifteen cases (54%) were classified under moderate severity and remaining 13 cases (46%) were classified under severe category. Moderate severity cases were treated with steroids. Seven cases out of 15 cases showed improvement in croup score at 18 hours of IM dexamethasone and 8 cases out of 15 were showed improvement at 20 hours of nebulised budesonide. Johnson DW, Jacobson S, Edney PC, Hadfield P, Mundy ME, Schuh S *et al* conducted a Randomised Control Trial study and concluded that the overall effectiveness was the same in various forms of steroids. Severe croup cases were treated with steroids and nebulised epinephrine. 9 cases of severe category showed improvement with nebulised epinephrine in 30 minutes post treatment. They assessed every 1 hour for the duration of 6 hours. marked improvement in croup score from baseline was observed after 6 hours. The remaining 4 cases were initially treated with systemic steroids and also they were needed nebulised epinephrine in addition to steroids. Westley CR, Cotton EK, Brooks JG. *et al* conducted nebulised epinephrine in the treatment of croup and showed favourable result on epinephrine: In the current study, there was a favourable outcome observed in all croup cases and there was no morbidity and mortality.

## CONCLUSION

Croup is mainly based on clinical signs and symptoms. The severity of croup cases clinically assessed by westley croup score which is used for assessment and management of croup. Treatment of all children with croup with corticosteroids and nebulized epinephrine can substantially decrease intubations, improving children's outcomes and lessening the burden of the disease on children's families.

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