

# Acute Laryngitis in Children: A Study of 121 Cases

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## ABSTRACT

**Objective:** The objective of the study was to study the clinical analysis of acute laryngitis in children. **Methods:** One hundred and twenty-one children with acute laryngitis who were treated in our hospital from January 2016 to June 2018 were selected as the observation objects. All the test indexes of the children met the diagnostic criteria of acute laryngitis in children. **Results:** The disease occurred frequently in the spring and autumn season, especially in 1–3-year-old boys. About 83% of the 121 children were treated with antibiotics, 83% were treated with intravenous hormones, and 99% were treated with budesonide atomization inhalation. The symptoms were not improved or even aggravated in 0 cases. **Conclusion:** The onset of the disease is urgent, the disease progresses rapidly, and it is easy to be complicated with laryngeal obstruction. Antibiotics, sufficient hormone, and oxygen atomization inhalation of budesonide should be given in time.

**Key words:** Acute, laryngitis in children, clinical analysis

## INTRODUCTION

In acute laryngitis, children are infected by bacteria and viruses, etc., where the mucous membrane of the vocal tract is damaged. As a result, an increase in the permeability of the mucosa and congestion and edema of the loose connective tissue occurs, which increases the hyperresponsiveness of the vocal tract.<sup>[1,2]</sup> Moreover, in children's laryngeal nerves are more sensitive, they are prone to spasms after acute stimulation, followed by symptoms such as dyspnea, wheezing, and even severe asphyxia.<sup>[3,4]</sup> The typical symptoms of laryngitis are inspiratory wheezing and a barking cough.<sup>[5]</sup> If timely and effective treatment is not taken, the condition can be aggravated progressively. In this paper, we presented our findings obtained from clinical data of 121 patients with acute laryngitis treated in our hospital from January 2016 to December 2018.

### Diagnostic criteria

It accords with the diagnostic criteria of acute infectious laryngitis in the 8<sup>th</sup> edition of Zhu Futang practical Pediatrics and the 9<sup>th</sup> edition of pediatrics written by Zhu Futang.

### Clinical grading

According to the severity of inspiratory dyspnea, laryngeal obstruction was divided into four degrees (The 8<sup>th</sup> edition of Zhu Futang practical Pediatrics page-1162), as presented below.

- Degree I: Inspiratory laryngitis and dyspnea occurred after exercise, and there was no change in respiratory sound and heart rate in lung auscultation.
- Degree II: Laryngeal dyspnea and inspiratory dyspnea also occurred at rest. Laryngeal conduction or tubular respiratory sound could be heard in lung auscultation and heart rate increased.

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- Degree III: In addition to the above symptoms of laryngeal obstruction, restlessness due to hypoxia, cyanosis of lips and fingers (toes), round eyes, panic, sweating of head and face, and the respiratory sound of lung decreased significantly, heart rate was fast, and heart sound was low.
- Degree IV: Gradually weak, lethargic state, due to inability to breathe, three concave signs are not obvious, pale and gray, lung auscultation respiratory sound almost disappeared, only tracheal conduction sound, arrhythmia, heart sound blunt, and weak.

## METHODS

A total of 121 patients with acute laryngitis treated in our hospital from January 2016 to December 2018 were selected as subjects. The sex and age distribution of the selected subjects was as; 83 males and 38 females, 36 patients aged 4 months–1 year, 61 patients aged 1–3 years, 10 patients aged 3–4 years, and only 13 cases were over 4 years old. The disease is more common in the spring season. Among them, 78 cases had a fever, 109 cases had hoarseness, 15 cases had laryngeal obstruction (Degree I obstruction 6%, Degree II obstruction 67%, and Degree III obstruction 27%), and 2 cases had convulsions. Consent was obtained from families of the patients to this data in this paper. Children with other serious diseases and drug contraindications were excluded from the study.

### Study area

Respiratory diseases.

### Study period

The study period was from January 2016 to December 2018.

### Study design

This was a longitudinal hospital-based observational study.

### Study population

Patients with acute laryngitis treated in our hospital.

### Inclusion criteria

The patients diagnosed as acute laryngitis, according to the 8<sup>th</sup> edition of Zhu Futang practical Pediatrics.

### Exclusion criteria

The patients with other diseases characterized similar to laryngitis.

### Sample size

The sample size was 121.

### Ethical considerations

This article has been reviewed by the ethics committee.

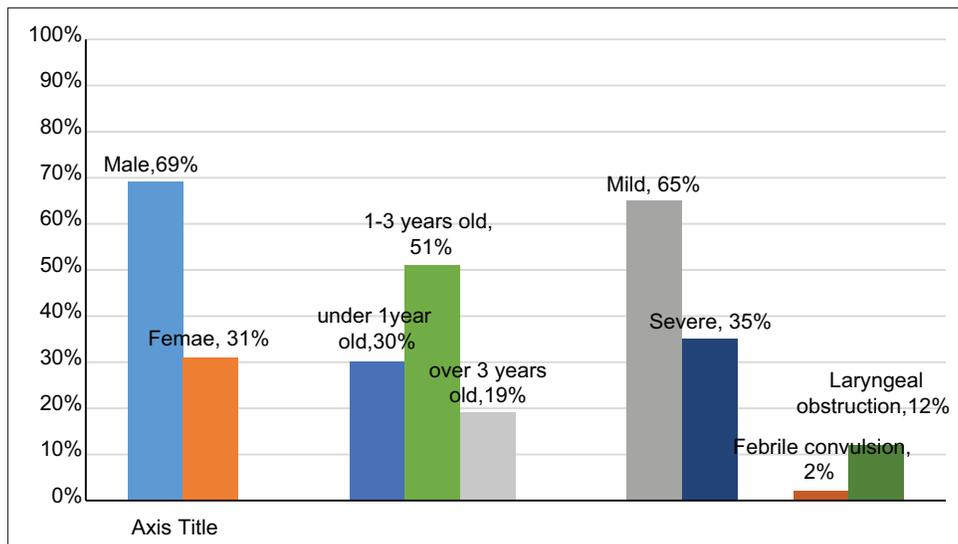
### Statistical analysis

The children were randomly distributed, given different treatment methods, observed the treatment effect, and drawn charts.

## RESULTS

### Features of the sample population

Among 121 cases, 69% were males, 31% were females, 30% were under 1 year old, and 51% were 1–3 years old. About 19% were over 3 years old [Figure 1]. Mild children accounted for 65% and severe cases accounted for 35%. According to the classification, we categorize a mild case and a severe case with the severity of inspiratory dyspnea, Degree



**Figure 1:** Percent distribution of gender, age, degree of illness, and complication in the study subjects

I or Degree II is a mild case, and Degree III or Degree IV is a severe case [Figure 1].

**Onset season**

The number of patients reported in our hospital showed that different seasons played their role to influence the percent spread of this disease. We found 41 cases in spring (34%), 32 cases in summer (26%), 34 cases in autumn (28%), and 14 cases in winter (12%) [Figure 2].

**Laboratory examination**

Abnormal erythrocyte distribution width variation coefficient accounted for 6%, erythrocyte distribution standard deviation abnormal accounted for 43%, leukocyte abnormal accounted for 30%, neutrophil abnormal accounted for 56%, C-reactive

protein (CRP) abnormal for 35%, and procalcitonin (PCT) abnormal for 37% [Figure 3].

**Treatment**

**Control of infection**

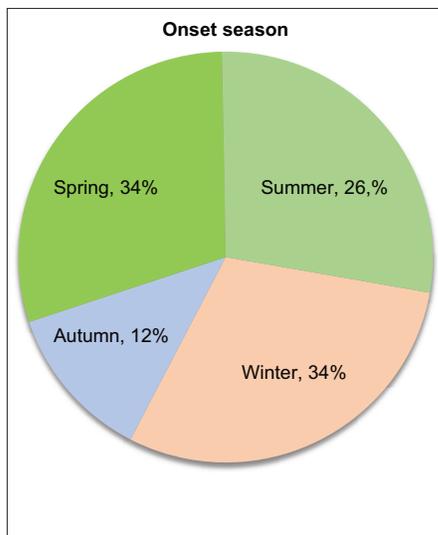
The disease of acute laryngitis is progressing rapidly, so it is difficult to quickly determine whether it is a virus or a bacterial infection. An appropriate and sufficient amount of broad-spectrum antibiotics should be selected as early as possible to control the infection. In general, children can be treated with an antibiotic. In patients with severe illness, more than two kinds of antibiotics can be used to exert a synergistic effect, and intravenous administration is appropriate.<sup>[6]</sup> Among 121 children admitted to hospital with acute infectious laryngitis during this period, 83% of the children were treated with antibiotics, of which 49% were cefuroxime sodium, ceftriaxone sodium 39% and erythromycin 5%.

**Glucocorticoid**

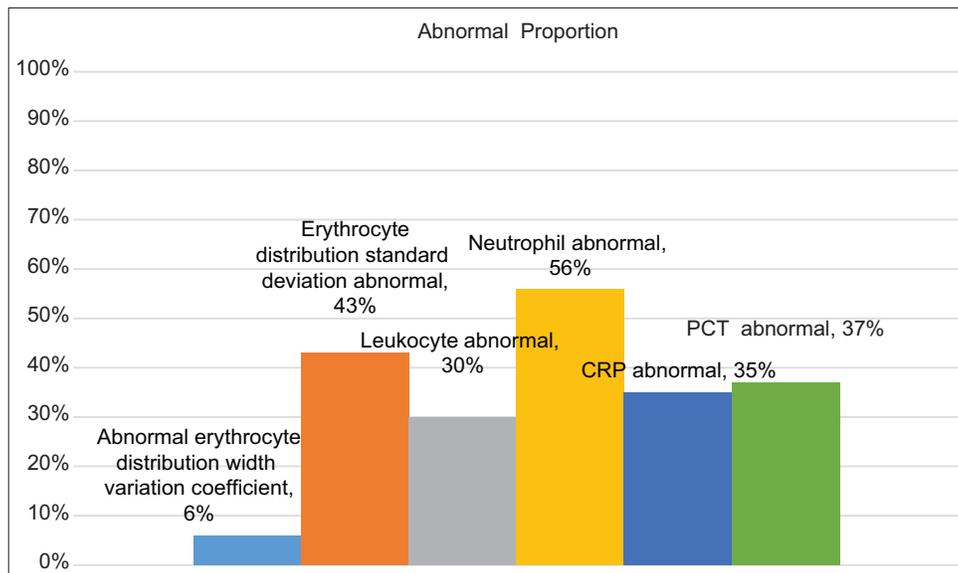
Hormones have anti-inflammatory and allergic effects and have a good effect in treating laryngitis, but the amount should be large enough, otherwise, it will not be effective. Intravenous dexamethasone (2–5 mg each time, increasing or decreasing depending on age) or hydrocortisone (5–10 mg/kg) should be administered in 4–6 h for patients with severe Degree II or Degree III respiratory distress.<sup>[7]</sup> Of the 121 children, the utilization rate of intravenous steroids is 83%; among them, 15% were dexamethasone, 84% methylprednisolone, 1% hydrocortisone, and nebulized budesonide 99% [Figure 4].

**Outcome of this study**

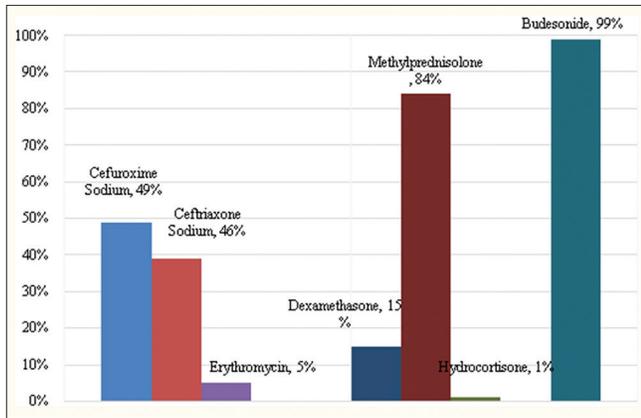
The disease occurred frequently in the spring and autumn season, especially in 1–3-year-old boys. About 83% of the 121 children were treated with antibiotics, 83% were treated



**Figure 2:** Different seasons and their impact on the % spread of the disease



**Figure 3:** Percent distribution of laboratory examinations



**Figure 4:** Percent distribution of the treatments given

with intravenous hormones, and 99% were treated with budesonide atomization inhalation. The symptoms were not improved or even aggravated in 0 cases.

## DISCUSSION

Acute infectious laryngitis refers to a diffused inflammation of laryngeal mucosa that is characterized by barking cough, hoarseness, laryngeal ringing, and inspiratory dyspnea caused by a viral or bacterial infection. Can also be concurrent in measles, whooping cough, influenza, and other acute infectious diseases, common viruses are influenza virus, parainfluenza virus, and adenovirus; common bacteria are *Staphylococcus aureus* and *Streptococcus pneumoniae*. A previously published study showed that the disease was most common in infants and young children (1–3 years old) and in boys, male (69%) and female (31%).<sup>[8]</sup> In laboratory indicators, leukocyte abnormalities (30%, including abnormal granulocytes, accounted for 56%), CRP abnormalities (35%), and PCT abnormalities (37%). Since most severe cases are associated with a bacterial infection, a certain amount of broad-spectrum antibiotics should be selected to control the infection at an early stage and delay the progression of the disease.

In this experiment, 12% of the children were complicated with laryngeal obstruction. After admission, the condition was effectively controlled by systemic application of antibiotics, local atomization inhalation, and systemic administration of appropriate amounts of hormones. For children with laryngeal obstruction, the Degree I and the Degree II should be treated effectively in time. Tracheotomy should also be performed on the fourth- and third-degree patients with dyspnea. Degree IV antibiotics should be used for 83% intravenous hormone 83% atomization inhalation. Tracheostomy should be performed immediately to save the life of the child.

Acute infectious laryngitis has an acute onset, is mild during the day, is severe at night,<sup>[9]</sup> and is easy to be complicated with laryngeal obstruction. If it is not rescued in time, it is easy to cause asphyxiation and death.<sup>[10]</sup> Therefore, it should be explained to the family members of the children that children with hoarseness should be diagnosed and treated early. Control the progress of the disease does not be careless.

## CONCLUSION

In 1-3-year-old boys, the spread of disease is more frequent in Spring and Autumn. Out of 121 children, 83% were treated with antibiotics and intravenous hormone, while 99% were treated with budesonide atomization inhalation. Antibiotics, sufficient hormone and oxygen atomization inhalation of budesonide should be given in time.

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