



## Epidemiology and clinical manifestations of bronchiolitis: A review

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### Abstract

The stages of diagnosis of bronchiolitis include (but not limited to): signs of upper respiratory tract infection or rhinorrhea, contact with people with upper respiratory tract infection before, signs of respiratory disease, including tachycardia penne, retraction, short breathing, long expiration, low oxygen saturation and wheezing at the age of under two years. The main problem for diagnosis of bronchiolitis is the differentiation of other diseases associated with wheezing. It is impossible to differentiate asthma by physical examination, but the age of the onset of the disease, the presence of fever and the lack of history (of a person or family) of asthma and allergies are the major contributors to differentiation. Bronchiolitis occurs primarily in the first year of life and is associated with fever. While asthma usually occurs in older children with repetitive visions, which are usually not accompanied by fever unless the respiratory tract infection of the asthma attack intensifies, bronchiolitis is difficult to distinguish from asthma during a wheezing attack. Bronchiolitis is a childhood illness with a peak between 2 and 6 months of age. Approximately 50% of children develop bronchiolitis during the first two years of life, and 80% of them develop this disease in the first year of life. The incidence of the disease rapidly develops between the ages of 1 and 2, after which bronchiolitis is uncommon. As age increases, the severity of infection with RSV is reduced, which indicates that age-related anatomical factors play a role in the pathogenesis of the disease. The need to repeat it every 15 to 20 minutes (up to 3 times) is prescribed. If no response was observed after bronchodillanur administration, bronchodillanur is no longer required, but if responding positively, bronchodilator can be repeated every 1-4 hours. The pathogenesis of edema and mucosal secretion is one of the main problems in patients. On the other hand, at an earlier age, the synchronization of the edema and the small diameter of the brinchildes can result in less responses to the use of specific beta 2 stimulant drugs, such as salbutamol; but non-specific beta 2 stimulants such as epinephrine can be inhaled by stimulating the alpha-adrenergic receptors, the vessels of the mucous membrane of the airway wall are reduced and the patient's respiratory distress and edema, thereby, decrease.

**Keywords:** epidemiology, clinical manifestations, bronchiolitis

### Introduction

The stages of diagnosis of bronchiolitis include (but not limited to): signs of upper respiratory tract infection or rhinorrhea, contact with people with upper respiratory tract infection before, signs of respiratory disease, including tachycardia penne, retraction, short breathing, long expiration, low oxygen saturation and wheezing at the age of under two years <sup>[1]</sup>. The main problem for diagnosis of bronchiolitis is the differentiation of other diseases associated with wheezing. It is impossible to differentiate asthma by physical examination, but the age of the onset of the disease, the presence of fever and the lack of history (of a person or family) of asthma and allergies are the major contributors to differentiation. Bronchiolitis occurs primarily in the first year of life and is associated with fever <sup>[2]</sup>. While asthma usually occurs in older children with repetitive visions, which are usually not accompanied by fever unless the respiratory tract infection of the asthma attack intensifies, bronchiolitis is difficult to distinguish from asthma during a wheezing attack <sup>[3]</sup>. Wheezing may have other causes, such as the presence of foreign bodies in the airway, maternal wounds that cause airway obstruction, and CF fibrosis. Dysplasia, bronchoconstriction, viral pneumonia or bacterial and other diseases of the lower respiratory tract, which should be considered in differential diagnosis, should also be noted <sup>[4]</sup>.

The main treatment of typical bronchiolitis involves taking effective measures to stabilize the patient's clinical condition, providing good effervescence and hydration. Antibiotics and corticosteroids are not useful in the treatment of bronchiolitis. In children with wheezing, it is advisable to try a booster dilator, but not to continue to do so unless there is an appropriate immediate response. Epinephrine has a better clinical response compared to Albuterol <sup>[5]</sup>. Considering the prevalence of Bronchiolitis, the large number of infants infected in the winter and the importance of differential diagnosis of diseases such as pneumonia and asthma in these patients, more knowledge of epidemiology, clinical symptoms, laboratory and disease symptoms can be a step towards better diagnosis of the disease and prevention of unnecessary antibiotic and corticosteroid administration. Therefore, this study was designed to determine the epidemiological characteristics, clinical and laboratory symptoms in children admitted in Golestan Hospital with diagnosis of bronchiolitis <sup>[6]</sup>. Many children who survived the onset of bronchiolitis experience repetitive attacks of wheezing that are clinically thought to be irritated with upper respiratory tract infections. Atopic evidence is considered to be the most important risk factor for recurring wheezing attacks. The addition of bacterial infection in bronchiolitis is usually a rare occurrence at least

in advanced countries. The basic pathophysiological issue in bronchiolitis, unlike pneumonia, is the obstruction of the lower airways, not the presence of fluid in the alveoli [7]. Bronchiolitis is usually characterized with respiratory epithelium necrosis with degeneration of the squamous layers, invasion of single-nucleotide lymphocytes, mucosal edema and adnexal layer, and small airway obstruction with dense block composed of dead epithelial cells, Fibrin and inflammatory cells. Macrophages and neutrophils are the dominant cells in the lungs of the affected population. In infants, especially infants under six months of age, due to the small diameter of the airways, edema and inflammation of the bronchial tubes can cause respiratory distress [8].

### Epidemiology

Bronchiolitis is a childhood illness with a peak between 2 and 6 months of age. Approximately 50% of children develop bronchiolitis during the first two years of life, and 80% of them develop this disease in the first year of life. The incidence of the disease rapidly develops between the ages of 1 and 2, after which bronchiolitis is uncommon. As age increases, the severity of infection with RSV is reduced, which indicates that age-related anatomical factors play a role in the pathogenesis of the disease [9].

It is estimated that only 10% of healthy children with brucellosis and wheezing require hospital admissions. Children with chronic pulmonary disease such as BPD, congenital heart disease with clear hemodynamic effects, neuromuscular weakness or immunodeficiency are at increased risk of severe disease. Children become infected after contact with infected family members who usually have symptoms of upper respiratory tract infection. Epidemics of bronchiolitis occur in moderate areas in cold months of the year and in tropical areas in rainy season and warm months [10].

Bronchiolitis occurs in boys more than girls, and the proportion of boys to girls is approximately 1.5 to 1. Some studies have shown that socioeconomic factors such as poverty, population growth, lack of breastfeeding, low maternal education and exposure to cigarette smoke are associated with an increased risk of developing lower respiratory tract infection when infected with RSV [11].

### Clinical symptoms

The need to repeat it every 15 to 20 minutes (up to 3 times) is prescribed. If no response was observed after bronchodilator administration, bronchodilator is no longer required, but if responding positively, bronchodilator can be repeated every 1-4 hours. The pathogenesis of edema and mucosal secretion is one of the main problems in patients. On the other hand, at an earlier age, the synchronization of the edema and the small diameter of the bronchioles can result in less responses to the use of specific beta 2 stimulant drugs, such as salbutamol; but non-specific beta 2 stimulants such as epinephrine can be inhaled by stimulating the alpha-adrenergic receptors, the vessels of the mucous membrane of the airway wall are reduced and the patient's respiratory distress and edema, thereby, decrease [12]. Although there is good evidence of a positive effect of corticosteroids on the treatment of other respiratory diseases such as asthma and croup, this principle

does not apply to bronchiolitis. Corticosteroids have been used frequently in the treatment of bronchitis. Considering that the main mechanism of bronchiolitis disease, inflammation and edema of the bronchioles mucosa, Steroids are expected to be effective in treating the disease, but most studies have shown that they are unaffected. In children who have non-respiratory indication for administration of corticosteroids, administration of these drugs should not be prevented due to fear of complications, although the duration of the virus may be increased in people treated with corticosteroids [13]. For patients with secondary severe bronchiolitis who are confirmed with RSV (confirmed by testing) and have a history of cardiovascular or pulmonary disease or HIV, Ribavirin is used, although the improvement of patients treated with antiviral drugs of ribavirin is unclear; additionally, no valid studies have shown that prescription of ribavirin can prevent death or need mechanical ventilation or shorten the duration of stay in the hospital [14].

Antibiotics are often used to treat bronchitis, which is due to fever, low age, and concern for secondary bacterial infection. Since bronchiolitis is a viral disease, antibiotics are neither useful nor necessary. However, in cases where radiographic images of pneumonia develop and the white blood cell count is elevated, the doctor will prescribe antibiotics. Many doctors discontinue the use of antibiotics after ensuring RSV infection because bacterial infection in the lung is rare in bronchiolitis, even when infiltration is detected in radiographic images of the lung. The use of antibiotics during the course of treatment should be limited to a period during which the course of the disease would suggest a secondary bacterial infection. Patients with bronchiolitis are more comfortable in supine position while the upper part of the bed is slightly raised. If there is a respiratory failure in the absence of respiratory sounds, a severe tachycardia in the tail between the ribs, oxygen saturation below 90% in the presence of 40% oxygen, cyanosis in the presence of 40% oxygen, reduced or no responses to painful stimuli and pressure  $CO_2$  over 65% may require a nasotracheal intubation, neuromuscular block and positive pressure ventilation. The use of intravenous immunoglobulin (IVIG), which has a large amount of RSV neutralizing antibodies, usually has respiratory rates associated with oxygen saturation, except when respiratory failure is imminent. In mild to moderate cases,  $CO_2$  retention does not occur, since the alveoli that function, compensates for the function of the alveoli. In severe cases, low blood pH and  $PCO_2$  are high [15].

Clinical findings (such as chest tightness) are usually not proportional to hypoxia levels measured with pulse oximetry. Children with severe dyspnea should be carefully evaluated because respiratory failure may occur quickly, even though the oximetry pulse is reassuring [16].

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