Scholar Publishing Group
International Journal of Public Health and Preventive Medicine
https://doi.org/10.38007/IJPHPM.2021.020405
ISSN 2789-8377 Vol. 2, Issue 4: 58-70

Clinical Features and Imaging Studies of Bronchiolitis Obliterans

McMaster Ellen*

Univ Fed Espirito Santo, Av Fernando Ferrari 514, BR-29075910 Vitoria, ES, Brazil

**corresponding author*

Keywords: Bronchiolitis Obliterans, Criteria, Pathological Features, Treatment Methods

Abstract: Bronchiolitis obliterans refers to lung bronchiole injury caused by infection or other reasons, coughing and wheezing that last more than 6 weeks, with or without breathing difficulties, exercise intolerance, which seriously affects physical and mental health and life Quality chronic airflow limitation syndrome.Bronchiolitis obliterans is mainly manifested by coughing and wheezing. Generally, there are 2-4 days of low-grade fever, nasal congestion and runny nose, accompanied by symptoms of lower respiratory tract diseases, including cough, shortness of breath, nasal inflammatory and tri-concave signs. You can hear expiratory wheezing during auscultation. A small number of severely ill children can develop heart failure or respiratory failure, or even life-threatening. Although bronchiolitis has a high cure rate, some children die, and it is closely related to repeated wheezing and the development of asthma in the future, even endangering children health. Bronchiolitis is associated with many risk factors, including premature birth, passive smoking, young age, lack of breastfeeding, malnutrition, chronic lung disease, congenital heart disease, atrioventricular block, male, ethnicity, viral infection , Low weight at admission, multiple pregnancy, mother smoking during pregnancy, allergic dermatitis, neonatal mechanical ventilation, mothers with allergies or asthma during pregnancy, season of birth, low socioeconomic status, Down syndrome, environmental pollution , Living environment height>2500 meters above sea level and cesarean section, etc. In order to study the clinical features and imaging of bronchiolitis obliterans, this article investigates the pathological characteristics of 100 patients from the hospital and conducts a follow-up survey of these 100 patients to understand the prognostic treatment of patients during and after treatment. The study found that the prevalence of bronchiolitis obliterans in infants under 1 year old is about 18-32%, the prevalence of children under 2 years old is 9-17%, and the prevalence of infants under 2 years old is about 1-3%. Children with bronchiolitis require hospitalization. Children with bronchiolitis obliterans are prone to have diarrhea during the course of their illness. In addition, myocardial damage and liver damage may also occur, and a small number of patients have heart failure, respiratory failure, and even endanger the life of the child. This shows that bronchiolitis obliterans is extremely harmful to children and needs to be paid attention to by parents and experts, and be prepared in its early and prognostic treatment.

1. Introduction

Bronchiolitis obliterans is a common respiratory disease in children, more common in infants and young children. The onset season is mostly winter and spring. The pathogens are mostly respiratory syncytial virus, including rhinovirus, influenza virus, adenovirus, and parainfluenza virus. Refers to chronic airflow limitation that severely affects children's physical and mental health and quality of life, such as coughing and wheezing that last more than 6 weeks after lung bronchiolar injury caused by infection or other reasons, with or without breathing difficulties, exercise intolerance, etc. Syndrome [1]. It is a pathological diagnosis, which is characterized by partial or complete obstruction of terminal respiratory bronchioles. It was discovered and named by German pathologist Lange in 1901. Constrictive bronchiolitis is mainly seen in children with obliterative bronchiolitis after infection. It is caused by the damage of the epithelial cells of the tracheal mucosa after acute lower respiratory tract infection. Compression near the bronchioles makes the nearby lumen narrow and difficult to pass. And, due to the special place where this problem occurs, it is difficult to reverse this process, causing serious damage to the bronchioles and harming the bronchioles and their nearby areas [2].

Clinically, it is easy to be misdiagnosed as other coughs, and treatment is delayed due to wheezing. There is no recognized treatment guideline. Mainly with symptomatic and supportive treatment, the overall prognosis is poor [3-4]. At the same time, chronic airway inflammation occurs after bronchial injury in the acute phase, resulting in irreversible airway fibrosis and airway obstruction. Early active anti-inflammatory treatment can block the disease process and improve the prognosis. In recent years, with the development of pulmonary HRCT technology, the diagnosis rate of bronchiolitis obliterans has increased compared with the past, and it has gradually attracted the attention of clinicians. However, clinically relying on the non-specific clinical manifestations of children and the diagnosis of lung HRCT makes the diagnosis and treatment relatively lagging. It is conducive to early intervention in the treatment of children with bronchiolitis obliterans, increases the risk of poor prognosis in children with bronchiolitis obliterans, and makes the families of children face a heavier economic burden [5]. Therefore, by summarizing the clinical data of bronchiolitis obliterans in children, analyzing the possible high-risk factors of bronchiolitis obliterans, and further understanding of bronchiolitis obliterans in children, it is helpful for clinicians to detect bronchiolitis obliterans early and treat obliterative bronchiolitis obliterans. Inflammation, improving the prognosis is of great significance.

For bronchiolitis obliterans, there are certain studies at home and abroad. Zhao Zhipeng made a clinical comparison of patients with bronchiolitis obliterans with different conditions, analyzed the differences in the condition and prognosis of each patient, and carried out statistics and research. Difference characteristics [6]; Zhang Fudong analyzed and compared the current diagnostic methods of bronchiolitis obliterans in children, introduced the principles and advantages and disadvantages of related methods, and focused on the role of multi-slice spiral CT in the diagnosis of bronchiolitis obliterans in children Explained [7]; Zhao Shunying studied how to recognize and manage bronchiolitis obliterans in the early onset, analyzed the principles of bronchiolitis obliterans formation, and research proved that early obliterative bronchiolitis can be treated by methods such as experimental mosaic perfusion. Inflammation improvement and intervention [8-9]; Dai Ge et al. conducted a clinical analysis of bronchiolitis obliterans through controlled experiments, and studied the clinical features, pathogenesis, treatment methods and prognosis of bronchiolitis obliterans , And summarized its characteristics [10]; Ma Ying studied the nursing methods for patients with bronchiolitis obliterans. Through a grouped controlled experiment, the patients were treated with general and comprehensive nursing methods. The research results proved that through comprehensive The effect of nursing treatment method is better than that of general nursing [11].

The research of the above experts has certain merits for the influence and treatment of bronchiolitis obliterans, but there are also certain shortcomings. For example, the early treatment and prognostic treatment of bronchiolitis obliterans are rarely discussed. In order to study effective prevention and treatment methods for bronchiolitis obliterans, this article uses case analysis to study the pathogenesis and prognostic treatment of bronchiolitis obliterans, and draws preliminary conclusions and makes some arguments. Some shortcomings, but it can still provide a certain theoretical basis for experts at home and abroad to study the improvement of bronchiolitis obliterans.

2. Principles and Treatment of Bronchiolitis Obliterans

2.1. Pathological Mechanism of Bronchiolitis Obliterans

Bronchiolitis obliterans generally occurs after infection, and viral infection is an independent risk factor for bronchiolitis obliterans after infection in children. The severity of the disease and the constitution of the host will also affect the prognosis of the disease. Mycoplasma pneumoniae is the pathogen most likely to develop bronchiolitis obliterans in addition to adenovirus infection, and further research is needed [12]. The clinical symptom relief rate of bronchiolitis obliterans after MP infection is higher, but the imaging changes are not obvious, and further study is needed. Measles, respiratory syncytial virus, and varicella-zoster virus can all cause bronchiolitis obliterans, but the number of cases in this study is small, and the conclusion is biased; bacterial and fungal infections in this study can also cause bronchiolitis obliterans , But there are many types of fungi and bacteria pathogens, so I won't repeat them here. As far as non-infectious factors are concerned, systemic diseases such as poisonous smoke affect the lungs, and can also cause the loss of lung bronchioles, trigger a series of inflammatory reactions, and develop into bronchiolitis obliterans, but there is no clear pathogenesis yet Mechanism [13].

Bronchitis obliterans, also known as constrictive bronchitis, is mainly caused after a relatively serious respiratory infection. Patients may find symptoms of high fever at the beginning of the onset, and even cause convulsions and convulsions. In addition, it will be accompanied by faster breathing rate in quiet conditions, shortness of breath, wheezing and other symptoms are also more obvious. It is also possible to see an inspiratory depression in the suprasternal fossa, which is usually accompanied by symptoms such as cyanosis of the lips. Active medication is needed to prevent suffocation. In terms of treatment, patients can take glucocorticoids to help the treatment, and at the same time can use macrolide drugs for anti-inflammatory treatment. After healing, they should maintain a regular life, take appropriate rest, avoid overwork, and give some light , Foods rich in vitamins.

Bronchiolitis obliterans is mostly caused by respiratory syncytial virus infection. The immune response caused by RSV can be protective or pathogenic, and appears to be initially infected in seronegative infants and older children or adults There are functional differences between re-infections. Despite the induction of antibody and T cell responses after the initial infection, and detectable antigenic changes in RSV surface glycoproteins, RSV can be reinfected throughout life. Many studies believe that the pathogenesis and immune response of RSV bronchiolitis obliterans are related to the direct cell damage from virus replication. T cell-mediated cellular immune response seems to be crucial for virus clearance during infection. The cellular immune response includes two subsets, T helper 17 cells (Th17) and regulatory T cells (Treg). The balance between these two subtypes may play an important role in the pathogenesis of RSV bronchiolitis obliterans [14 -15].

When infected with RSV, bronchial epithelial cells stimulate differentiation into Th17 cells while inhibiting differentiation into Treg cells. Th17 cells produce IL-17. Since IL-17 receptors are

ubiquitous on epithelial cells, endothelial cells, monocytes and macrophages, IL-17 not only increases mucus secretion, but also increases Th2 cell production of Th2 cytokines, such as IL-13. IL-13 is a key factor that regulates airway hyperresponsiveness and airway epithelial mucus production, affects the migration of eosinophils to the lungs, and may also cause smooth muscle spasm . The main role of Treg cells is to maintain immune balance by avoiding excessive effector T cell activation and tissue damage, thereby helping to maintain homeostasis during infection. Treg cells interfere with the survival of T cells by producing inhibitory cytokines IL-10 and transforming growth factor β (TGF-β), and directly eliminate effector cells and inhibit antigen-presenting cells (APC) through IL-2 consumption and secretion. Maturity plays a role. In addition to the balance between T helper 17 cells (Th17) and regulatory T cells (Treg), some studies have provided evidence for the imbalance of Th1 and Th2 responses during severe RSV infection, Th2 advantage, and the serum or nasopharyngeal of children infected with RSV The increase in the IL-4 concentration in the aspirate leads to ineffective virus clearance and increased disease severity. On the other hand, it reduces the Th1 reaction and the IFN-γ concentration in the serum or nasopharyngeal aspirate decreases, thereby reducing the virus clearance rate [16].

2.2. Inspection Methods for Bronchiolitis Obliterans

Lung biopsy is the gold standard for diagnosing BO. Due to the limitations of pathological examinations, the diagnosis of BO is mainly a clinical diagnosis, which mainly relies on clinical manifestations, imaging changes, abnormal lung function, and excludes the possibility of other obstructive lung diseases, and can be assisted by fiberoptic bronchoscopy. For example, it is now believed that after some inducements such as inhalation injury, drugs, viruses, Mycoplasma pneumoniae, and some bacterial infections, persistent coughing and wheezing or difficulty breathing, chest HRCT examination has typical manifestations such as mosaic sign, gas trapping sign, peripheral bronchus Thickening and expansion of the tube wall can be clinically diagnosed. [17-18].

The pathogenesis is diverse, and the specific pathogenesis is not clear. The main clinical manifestations are: frequent coughing and wheezing, dyspnea, decreased endurance, exertion, etc., lack of characteristic clinical manifestations, and easy to be misdiagnosed as other cough and wheezing diseases. For delayed treatment, there is no recognized treatment guideline so far, mainly symptomatic and supportive treatment, and the overall prognosis is poor. At the same time, the bronchioles appear chronic airway inflammation after the acute phase of damage and form irreversible airway fibrosis and airway occlusion. Early active anti-inflammatory treatment may block the progress of the disease and improve the prognosis. In recent years, with the development of pulmonary HRCT technology, the diagnosis of bronchiolitis obliterans has increased than before, which has gradually aroused the recognition of clinicians, and clinically relying on children's non-specific clinical manifestations and lung HRCT for diagnosis makes diagnosis and treatment exist Hysteresis is not conducive to early intervention and treatment of children with bronchiolitis obliterans, increases the risk of poor prognosis for children with bronchiolitis obliterans, and makes the family of children with children face a heavier financial burden. Therefore, by summarizing the clinical data of children with bronchiolitis obliterans and analyzing the possible high-risk factors of bronchiolitis obliterans, we have a better understanding of bronchiolitis obliterans in children, so that clinicians can identify and treat bronchiolitis obliterans early. Bronchitis and improving the prognosis are of great significance [19].

The clinical treatment of bronchiolitis obliterans is a long process, and long-term follow-up is required. The patient's condition is judged in real time based on the child's clinical symptoms, signs, lung function, airway inflammation, and imaging changes, so as to adjust the medication.

At present, clinical imaging examinations of the lungs are widely used, including chest radiograph and high-resolution CT (HRCT). Patients with bronchiolitis obliterans detect whether there are abnormalities in their chests, which are often inconsistent with the clinical symptoms of the children. The chest radiograph of children with severe clinical symptoms may only show increased transparency.

1) Chest X-ray examination

Carofina et al. found that the chest radiograph changes of 35 children with PI bronchiolitis obliterans were as follows: peribronchial thickening accounted for 66%, atelectasis accounted for 51%, lung hyperinflation accounted for 54%, and patchy alveolar infiltration accounted for 34%. %, unilateral transparent lung accounted for 3% and local light transmission enhancement accounted for 3%, and only 2 cases (6%) showed normal chest x-ray [20].

2) Lung tissue biopsy and fiberoptic bronchoscopy

For bronchiolitis obliterans, it is generally believed that open-chest lung biopsy is the best way to confirm the diagnosis. However, due to various limitations, for example, open-chest detection of bronchiolitis obliterans may be raised to the undiseased part, resulting in this method in Difficult to operate in practice. At present, the general detection method for bronchiolitis obliterans is mainly based on medical history, symptoms, and signs. Lung biopsy is only suitable for patients who have no response after treatment and whose condition is progressively worsening. Fiberoptic bronchoscopy can rule out airway malformations, bronchial foreign bodies and other diseases, and bronchial mucosal biopsy can be taken to provide a basis for further diagnosis of bronchiolitis obliterans [21].

3) Lung ventilation perfusion scans

Experiments have shown that lung ventilation and perfusion scans are of great help in the diagnosis of bronchiolitis obliterans. Using this method, the specific location of lung injury can be determined. Compared with other methods, lung ventilation and perfusion scans are easy to operate and are not when detecting and scanning, the pulmonary condition can be clearly understood, and the misdiagnosis is low. It has a more obvious display for the condition of bronchiolitis obliterans, and has important significance for subsequent treatment and changes [22]..

2.3. Diagnostic Criteria

In theory, lung biopsy is the most common examination method for bronchiolitis obliterans in the world. However, due to the limitations of lung biopsy, it is difficult to accurately detect bronchiolitis obliterans in practice and promotion. [23], so it is difficult to really promote. This diagnostic standard refers to the standard issued by the State Medical Administration:

1) Predisposing factors: often have a history of chronic diseases (repeated cough, asthma, tuberculosis, heart palpitations, etc.), induced by fatigue or external feelings.

2) Symptoms: Difficulty breathing, cyanosis of the lips, shortness of breath, nasal incitement, and even opening the mouth and raising the shoulders and cannot lie supine.

3) Physical signs: distended jugular vein, hepatomegaly, and lower extremity edema; excessive voicelessness in the chest, reduction or disappearance of the heart dullness boundary, lowering of the liver dullness boundary; low breath sounds on lung auscultation, and dry and wet rales or wheezing may be heard Beep.

4) Others: The total number of white blood cells and neutrophils can be increased in co-infection, and auxiliary examinations such as serum electrolytes and imaging, electrocardiogram, heart and lung function, blood gas analysis, etc. can be improved.

The typical symptoms of bo are repeated or persistent shortness of breath, wheezing or coughing, wheezing with fever, etc., lung CT bronchial wall thickening, white blood cells elevated, and

C-reactive protein positive. In this case, you can go to the hospital for examination and treatment, and anti-inflammatory , Fever, atomized inhalation, etc. If the child has symptoms of coughing, wheezing, and suffocation, first give the child oxygen inhalation. In addition, take some drugs for treatment. At the same time, be sure to give the child some warm water and monitor her body temperature at any time.

2.4. Treatment Methods

(1) Glucocorticoid

Glucocorticoids can reduce airway hyperresponsiveness and inflammation. The first report of the use of hormones was in a 1958 study in which rabbits were injected with steroids to prevent the progression of bronchiolitis obliterans. Nowadays, it has been widely used in bronchiolitis obliterans, but experts have different opinions on the dosage and usage of hormones. Studies have suggested that the initial dosage of oral glucocorticoids is usually 1-2 mg/(kg d), and the dosage begins to decrease after 1-3 months, and the treatment course is 6-12 months or longer [24-25]. A foreign scholar in a study of 40 children with bronchiolitis obliterans found that the injection method should be intravenous injection, with a dosage of 30mg/(kg d), three times in a row, once a month, the patient's wheezing The number of attacks and hospitalizations were reduced, and oxygen saturation was improved. Research data proves that corticosteroid pulse therapy can be a safe alternative to avoid the side effects of continuous oral corticosteroid therapy. However, there is no relevant controlled study, Further prospective controlled studies are necessary to confirm these findings. In addition, studies have shown that if patients with bronchiolitis obliterans have bronchial wall thickening on HRCT, intravenous methylprednisolone therapy can improve the symptoms of bronchiolitis obliterans.

(2) Bronchodilator

Bronchiolitis obliterans is a chronic obstructive airway disease. Theoretically, it does not respond significantly to bronchodilators. This is also one of the clinical features of bronchiolitis obliterans. However, research by RitaMattiello et al. showed that in 72 cases of obstructive bronchiolitis obliterans Bronchodilators are used in patients. The lung function of children in this study has been improved, especially FEF 25-75%. This trial proved that bronchodilators can change the lung function of bronchiolitis obliterans and clear the obstructive lung. Ventilation disorders can improve and relieve the clinical symptoms of bronchiolitis obliterans [26].

(3) Macrolide antibiotics

Bronchiolitis obliterans patients, due to respiratory mucosal diseases, often combined with bronchiectasis and other diseases, are prone to respiratory tract infections, especially conditional pathogen infections. Macrolide drugs have non-specific anti-inflammatory effects and reduce the exposure of disease-causing organisms. Studies have shown that azithromycin is an important treatment option for patients with bronchiolitis obliterans caused by lung transplantation, and can improve the survival rate of patients after lung transplantation. KatharinaKrenn et al. found that interleukin-17 may play a role in lung allograft rejection, and azithromycin can reduce the expression of interleukin-17. The anti-inflammatory and immunomodulatory effects of azithromycin may be more prominent than its antibacterial effects at low doses. As an adjuvant therapy to conventional immunosuppressive therapy, azithromycin has played a great role, especially in the regulation of innate immune response.

(4) Other treatment methods

1) Oxygen therapy some patients with hypoxic bronchiolitis obliterans need long-term oxygen therapy. Portable oxygen concentrators can be used for oxygen therapy to maintain oxygen saturation above 94%. Studies have pointed out that patients with bronchiolitis obliterans have a

high risk of nocturnal hypoxia, and the assessment and treatment of nocturnal hypoxia should be part of the disease management of patients with bronchiolitis obliterans.

2) Fiberoptic bronchoscopy can use fiberoptic bronchoscopy to exclude airway malformations and airway foreign bodies, and can be used as a treatment method to reduce acute inflammation by bronchoalveolar lavage through fiberoptic bronchoscopy.

3) Non-steroidal anti-inflammatory drugs have been studied for hydroxychloroquine for the treatment of patients with severe bronchiolitis obliterans.

4) Influenza vaccination and avoiding the inhalation of second-hand smoke and other toxic gases can reduce the chance of respiratory infections and improve the prognosis of bronchiolitis obliterans.

Prognostic criteria: 1) Clinical remission: no cough and asthma attacks, good activity tolerance, disappearance of pulmonary rales, no recurrence of clinical symptoms after stopping drug treatment, significant improvement in lung function, and disappearance of HRCT mosaic perfusion sign;

2) Partial clinical relief: clinical symptoms are repeated, cough and asthma symptoms are slightly improved, and activity tolerance is slightly poor; lung function is not significantly improved, and HRCT mosaic perfusion sign exists;

3) The clinical condition persists: persistent cough and asthma symptoms, poor activity tolerance; no improvement in lung function, HRCT mosaic perfusion sign exists;

4) Deterioration of clinical conditions: persistent cough and asthma symptoms, easy to merge with respiratory tract infection, symptoms aggravate after infection, poor activity tolerance, severely affecting the quality of life, deterioration of lung function, persistent or even worsening of HRCT mosaic perfusion.

3. Bronchiolitis Obliterans Experiment

3.1. Experimental Purpose

Through the follow-up investigation of patients, we learned about the pathology of bronchiolitis obliterans and whether bronchiolitis obliterans is effectively controlled after treatment and whether the control effect is obvious. To study the clinical features and imaging of bronchiolitis obliterans, summarize and analyze the clinical features, treatment and prognosis of bronchiolitis obliterans, and provide reference for the early diagnosis, early treatment and prognostic judgment of bronchiolitis obliterans.

3.2. Experimental Analysis Objects

Through collecting clinical data (gender, age at diagnosis or diagnosis, clinical symptoms and signs at admission) of 100 children diagnosed with bronchiolitis obliterans in the inpatient department of Guangdong Children's Hospital, auxiliary examinations include seven respiratory virus antigen tests, T lymph Cell subpopulation detection, allergen detection, fiber bronchoscopy, BALF cytology count, lung function, lung CT, etc.), follow-up by telephone consultation and outpatient consultation. Perform retrospective analysis on the collected data and draw conclusions.

3.3. Data Sources

The data in this article are mainly derived from the clinical data of the inpatient diagnosis of Guangdong Children's Hospital from 2015 to 2019, as well as the statistics of on-site understanding of patients and telephone interviews. After that, the statistical data is classified and analyzed, and simulated by computer software.

4. Experimental Analysis of Occlusive Bronchioles

4.1. Distribution of Patients with Occlusive Bronchiole

Through the investigation of 100 patients, we have counted the age and gender of the patients. The specific distribution is shown in Table 1:

Table 1. Distribution of men and women

	0-2(age)	3-7(age)	8-11(age)	Greater than 11(age)
male	24	23	15	7
female	9	12	6	4

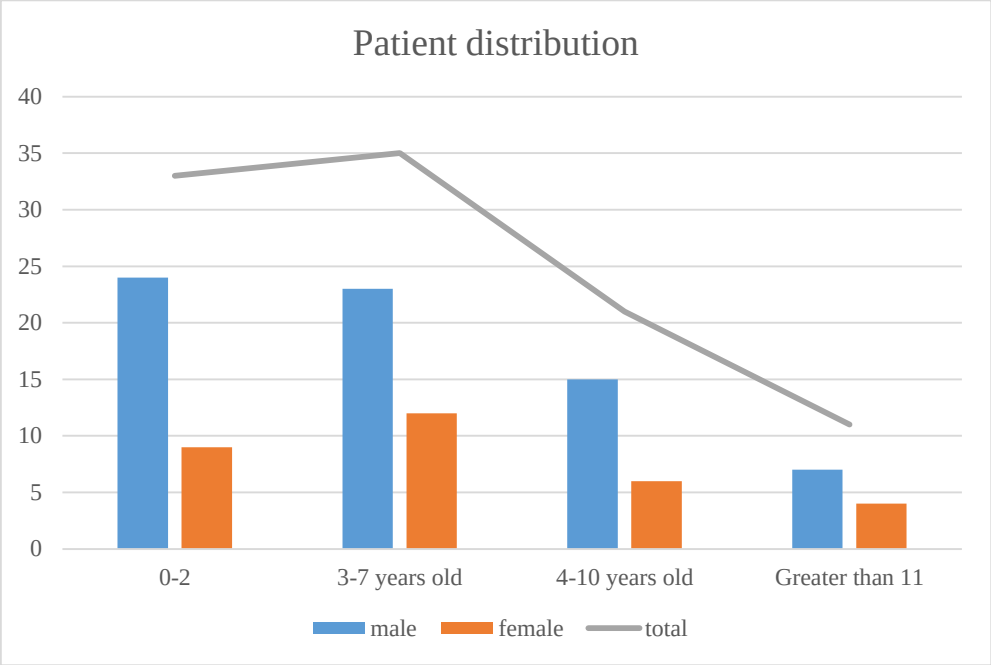

Figure 1. Distribution of men and women

From Table 1 and Figure 1, we can see that there are 69 males and 31 females out of 100 children. The male constituent ratio is higher than the female constituent ratio. In terms of age distribution, the average diagnosis age is 2.7 years, which is significantly higher than other age groups. The main clinical manifestations were continuous and repeated coughing and wheezing, which could be accompanied by shortness of breath, exercise intolerance, rales and wheezing in the lungs, and clubbing in 2 cases. Among them, 22 children required mechanical ventilation (including tracheal intubation and non-invasive ventilation), and 17 required nasal catheters for oxygen.

4.2. Causes of Patients

By investigating the cause of the patient's illness and communicating with the patient's attending doctor, we have obtained the cause of the patient's illness. The specific statistics are shown in Figure 2:

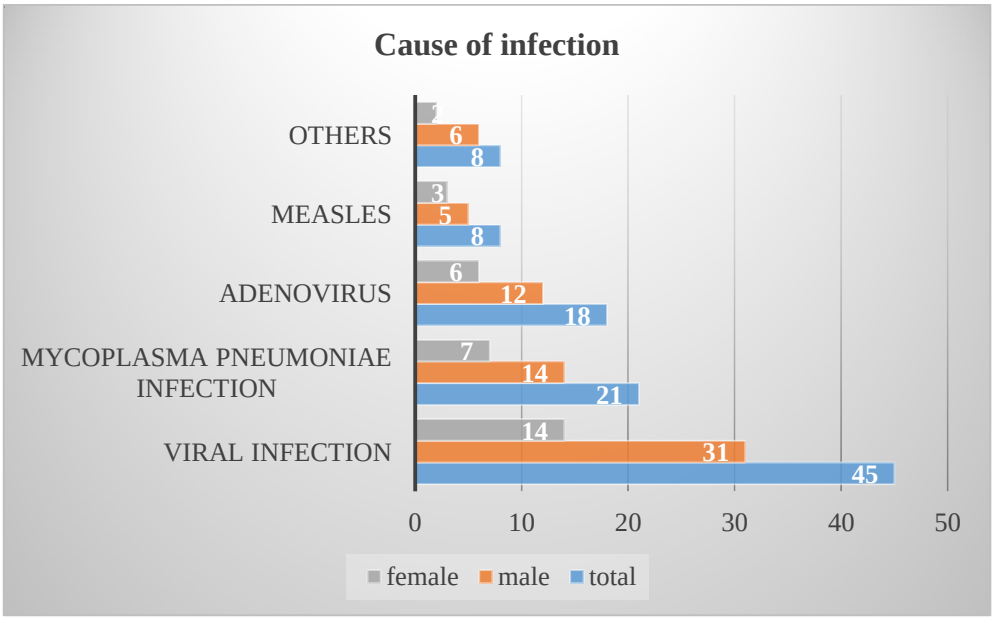

Figure 2. Cause of illness

From Figure 2, we can see that the main pathogenic factor of bronchiolitis obliterans is infection. There are 45 cases of viral infection, and the composition ratio of viral infection is higher than other pathogenic factors; in terms of source of infection, 18 cases of Mycoplasma pneumoniae infection, Mycoplasma pneumoniae The composition ratio is second only to adenovirus, followed by measles and bacteria. Thirty of the children underwent allergen testing, and the results suggested that children with bronchiolitis obliterans were mainly allergic.

4.3. Situation after Treatment

We conducted a post-treatment survey of these 100 patients. After treatment, most of the patients' symptoms improved, as shown in Figure 3:

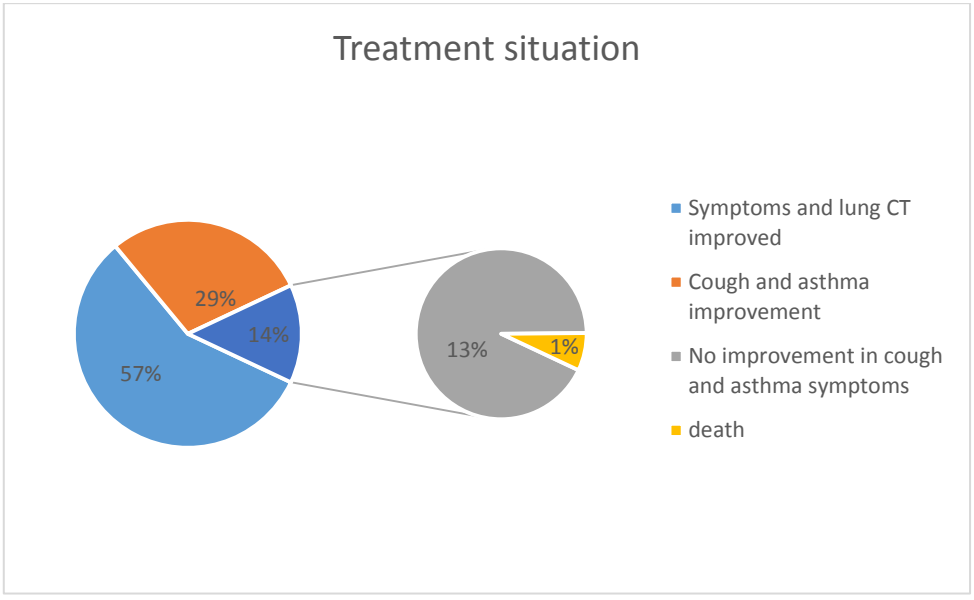

Figure 3. Patient situation

From Figure 3, we can see that all patients were treated with budesonide + terbutaline combined with nebulization after discharge, after adjuvant other supportive treatments. Fifty-seven children with symptoms and lung CT improved (57%), 29 children with cough and asthma improved (29%), 13 cases with cough and asthma symptoms did not improve (13%), and one child died (1%).

4.4. Overall Patient Distribution

After conducting surveys and statistics on all patients, we learned the incidence of patients at various ages, as shown in Figure 4:

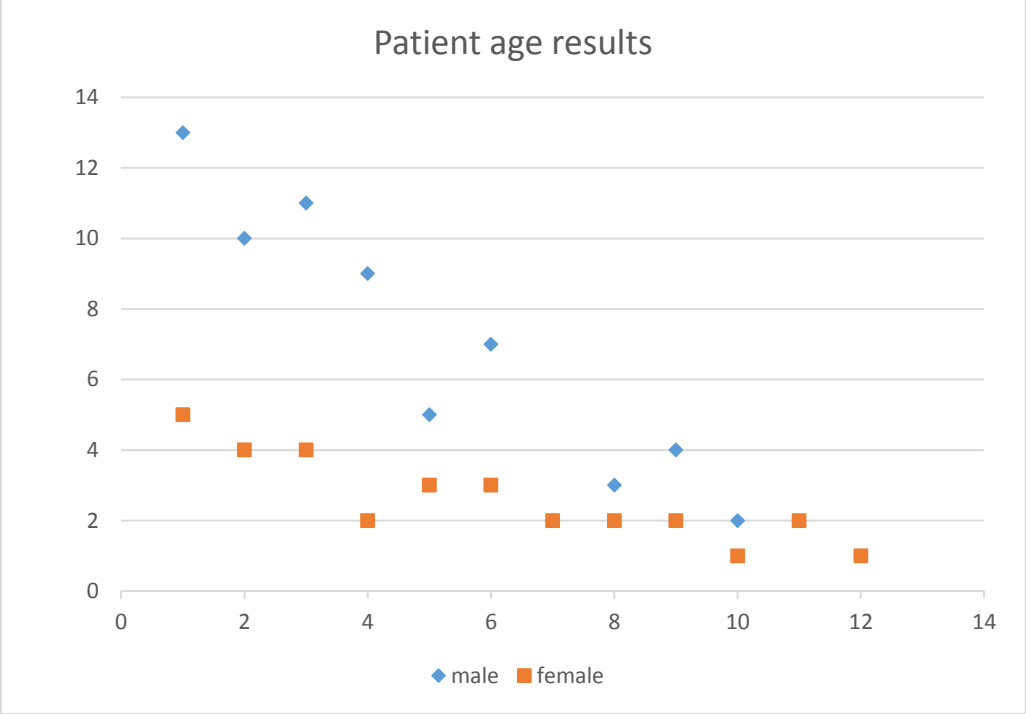

Figure 4. Patient age distribution

Through the above experimental data, we can draw the following conclusions:

(1) Children's bronchiolitis obliterans tends to occur in infants aged 0-3 years, and males are higher than females.

(2) Children's bronchiolitis obliterans are mainly infections. Mycoplasma pneumoniae has a greater chance of causing childhood bronchiolitis obliterans, second only to adenovirus. Among the 100 children, 69 were males and 31 were females. The male constituent ratio was higher than the female constituent ratio. In terms of age distribution, the average age at diagnosis is 3.7 years

(3) Most of the clinical symptoms of children with bronchiolitis obliterans can be relieved after anti-inflammatory treatment. Early diagnosis and treatment can shorten the time of clinical symptom relief, but there are still some children with bronchiolitis obliterans that have no obvious imaging changes after treatment.

5. Conclusion

Bronchiolitis obliterans has various causes and infections are more common. The main clinical symptoms are cough, wheezing, shortness of breath, wet rales and wheezing in the lungs that last longer than 6 weeks, and mosaic perfusion signs in lung HRCT. Air retention symptoms are its

characteristic manifestations. The treatment is mainly combined with nebulization, macrolides, hormones, montelukast sodium, immunomodulators, etc.; good home care; long-term adherence to medication, on time and on time In order to improve the prognosis. At present, there is no clear treatment plan and targeted drugs, and the overall prognosis is poor.

Bronchiolitis obliterans is mainly manifested by coughing and wheezing. Generally, there are 2-4 days of low-grade fever, nasal congestion and runny nose, accompanied by symptoms of lower respiratory tract diseases, including cough, shortness of breath, nasal inflammatory and tri-concave signs. You can hear expiratory wheezing during auscultation. A small number of severely ill children can develop heart failure or respiratory failure, or even life-threatening. Although bronchiolitis has a high cure rate, some children die, and it is closely related to repeated wheezing and the development of asthma in the future, and even endangers children health. Bronchiolitis is associated with many risk factors, including premature birth, passive smoking, young age, lack of breastfeeding, malnutrition, chronic lung disease, congenital heart disease, atrioventricular block, male, ethnicity, viral infection , Low weight at admission, multiple pregnancy, mother smoking during pregnancy, allergic dermatitis, neonatal mechanical ventilation, mothers with allergies or asthma during pregnancy, season of birth, low socioeconomic status, Down syndrome, environmental pollution , Living environment height>2500 meters above sea level and cesarean section, etc.

In short, bronchiolitis obliterans is a common disease in infants and young children, with a high prevalence rate. Some children are prone to recurrent attacks after being cured, and eventually develop into asthma. We should have a deep understanding of this common disease, strengthen health education, provide active, reasonable and useful treatment to children, and try our best to prevent the recurrence of bronchiolitis obliterans.

Funding

This article is not supported by any foundation.

Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

References

[1] Liang Dongge, Han Zhiying. Clinical analysis of 30 children with bronchiolitis obliterans. Chinese Medicines and Clinics, 2016, 16(03):421-423.

[2] Zhao Zhipeng, Liu Xiuyun. Comparison of clinical features in children with bronchiolitis obliterans in different conditions. Chinese Journal of Practical Pediatrics, 2015, 030(008):605-609.

[3] Xia Liping, Jiang Yi. Research progress of bronchiolitis obliterans in children. Chinese Journal of Applied Clinical Pediatrics, 2015, 001(30):1754-1757.

[4] Han Qing, Shi Yu, Li Hongxia, et al. A case of childhood bronchitis obliterans with bronchiolitis obliterans with organizing pneumonia and literature review. Chinese Journal of Pediatrics, 2016, 54(000):523-526.

[5] Zhang Fudong, Tuan Rongrong, Yang Ruishan, et al. Diagnostic value of multi-slice spiral CT in children with bronchiolitis obliterans. Journal of Practical Medical Techniques, 2016, 23(04):374-375.

[6] Zhuang Juan, Wu Depei, Gu Bin, et al. Clinical analysis of bronchiolitis obliterans syndrome after haplotype hematopoietic stem cell transplantation. Chinese Journal of Hematology, 2019, 040(005):404-410.

[7] Zhao Shunying, Wen Xiaohui. Early recognition and treatment of bronchiolitis obliterans after severe infection. Chinese Pediatric Emergency Medicine, 2017, 24(12):881-882,887.

[8] Dai Ge, Wang Ting, Jiang Wujun, et al. Clinical analysis of 37 cases of bronchiolitis obliterans after adenovirus pneumonia. Chinese Journal of Applied Clinical Pediatrics, 2020, 35(16):1235-1238.

[9] Zheng Yinglian, Mao Guoqi. The relationship between serum antineutrophil cytoplasmic antibodies and diagnosis and treatment of bronchiolitis obliterans in children. Labeled Immunoassays and Clinics, 2020, v.27; No.159(01):75- 78.

[10] Yuan Liyuan. Bronchiolitis obliterans and bronchiolitis tidal breathing lung function and exhaled nitric oxide changes. Jilin University, 2015, 03(16):123-125.

[11] Xi Jicheng, Zhang Zhibiao, Wang Chongjun, et al. Simvastatin combined with cyclosporin A inhibits the occurrence of bronchiolitis obliterans in a heterotopic tracheal transplantation model in mice. Chinese Journal of Organ Transplantation, 2019, 040(009):558- 562.

[12] Liu Ting, Liu Xiaohong, Li Jianqiang. A case of bronchiolitis obliterans with organizing pneumonia. Clinical Medicine Practice, 2017, 004(007):58- 62.

[13] Tang Yan, Liu Cheng, Bi Wanli, et al. Dual-source Flash CT manifestations of bronchiolitis obliterans in children after infection and preliminary study of its relationship with pathology. Journal of Clinical Radiology, 2015, 34(010):1650 -1654.

[14] Huang Wenxian, Wang Yulei, Xu Shoujun, et al. Clinical features and HRCT manifestations of bronchiolitis obliterans in children after infection. Chinese Journal of CT and MRI, 2015, 001(12):7-10.

[15] Chen Fujiang, Wu Tiefeng, Wu Chaoxiong, et al. Clinical analysis of bronchiolitis obliterans after measles pneumonia in children. Chinese General Practice, 2015, 13(010):1645-1647.

[16] Li Sijie. Research progress of bronchiolitis obliterans in children. International Journal of Pediatrics, 2017, 044(005):316-319,323.

[17] Yang Ting, Rao Huaping, Jin Shijie, et al. Clinical observation of terbutaline combined with budesonide nebulized inhalation in the treatment of infantile bronchiolitis obliterans after infection. Journal of Pediatric Pharmacy, 2016, 022(007):19-21.

[18] Liu Yuping, Wang Xiaodong, Zhao Qian. Analysis of CT manifestations and signs of bronchiolitis obliterans in children. Journal of Medical Imaging, 2016, 001(7):1327-1329.

[19] Liu Qunhui, Qu Wenjing, Chen Yan. Clinical study of integrated traditional Chinese and western medicine in the treatment of bronchiolitis obliterans in children. Community Medicine Journal, 2015, 13(001):36-38.

[20] Chang Li, Liu Zhuo, Wang Yuping, et al. Serum vascular endothelial growth factor expression in children with bronchiolitis obliterans and its correlation with the course of disease. Chinese Journal of Practical Pediatrics, 2016, 001(31):947-948.

[21] Zhen Junfeng, Zhang Lu, Cao Xinxin, et al. Clinical analysis of single center Castleman disease with paraneoplastic pemphigus and bronchiolitis obliterans. Journal of Chinese Academy of Medical Sciences, 2017, 39(004):492-498.

[22] Yin Zifu. Staged nursing care of children with bronchiolitis obliterans. Journal of Nursing Science, 2015, 30(017):32-34.

[23] Chen Junxing, Hong Qingshan, Wang Xiaoli, et al. The application value of multi-slice spiral CT in the classification and staging of infantile bronchiolitis obliterans. The Journal of Practical Medicine, 2017, 33(3):470-472.

[24] Lian Xinyi. Professor Xu Rongqian's clinical experience in treating pediatric bronchiolitis obliterans with external therapy. Global Chinese Medicine, 2016, 9(009):1089-1091.

[25] Zhang Xiaoyan, Lin Jiangtao, Jia Yuping, et al. A case of bronchiolitis obliterans associated with paraneoplastic pemphigus secondary to lymphoma and literature review. Chinese Journal of Respiratory and Critical Care, 2019, 018(001):70- 75.

[26] Xu Jing. The relationship between CMV reactivation and bronchiolitis obliterans after allogeneic hematopoietic stem cell transplantation. Chinese Journal of Hematology, 2015, 36(005):389-392.