

THE DIAGNOSIS OF BRONCHIOLITIS IN NEONATES (A REVIEW)

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Abstract: - Bronchiolitis is the most common disease of the lower respiratory tract in patients under the age of 2 years; the main clinical symptom includes the occurrence of the first visceral attack in infants younger than 12-24 months, with physical findings of a viral infection rather than pneumonia or atopy. Bronchiolitis occurs as a result of inflammation in small airways (bronchioles). Upper respiratory infections with any of the seasonal viruses can cause bronchiolitis. The disease may cause a range of complications, from a mild to severe clinical symptom and a life-threatening respiratory distress. The main factors causing the development of the severe form of bronchiolitis include racial factors, prematurity, bronchopulmonary dysplasia (BPD), congenital heart disease, and current weights of less than 5 kg. Being male, belonging to African-American ethnicity, and a history of asthma in parents are associated with an increased risk of outbreak or prolonged period of this disease. Routine laboratory tests do not have the necessary attributes for the diagnosis of bronchiolitis and are not required for confirmation of diagnosis. Mild leukocytosis of 12,000 to 16,000 per microliter is often present but non-specific.

The count of eosinophils in acute RSV infection is reduced like other infections. However, some patients develop elevated eosinophils, making them more prone to the progression to asthma. The pulse oximeter technique limits the need for an arterial blood sample, except in the case of extreme cases of anxiety. Recent studies do not routinely take photos of chest x-ray in infants with bronchiolitis. Although there are abnormalities in the breast picture of most infants with bronchiolitis, they include non-specific findings. There is insufficient information to prove that chest x-ray is associated with severity of bronchiolitis.

Key words: - Bronchiolitis , neonates , Review

Introduction:

Bronchiolitis is the most common disease of the lower respiratory tract in patients under the age of 2 years; the main clinical symptom includes the occurrence of the first visceral attack in infants younger than 12-24 months, with physical findings of a viral infection rather than pneumonia or atopy (1). Bronchiolitis occurs as a result of inflammation in small airways (bronchioles). Upper respiratory infections with any of the seasonal viruses can cause bronchiolitis (2). The disease may cause a range of complications, from a mild to severe clinical symptom and a life-threatening respiratory distress. The main factors causing the development of the severe form of

bronchiolitis include racial factors, prematurity, bronchopulmonary dysplasia (BPD), congenital heart disease, and current weights of less than 5 kg (3). Being male, belonging to African-American

ethnicity, and a history of asthma in parents are associated with an increased risk of outbreak or prolonged period of this disease. Acute bronchiolitis is the most common cause of respiratory illness during infancy; it causes about fifty to eighty thousand hospitalizations per year among children under the age of one (4). Respiratory Syncytial Virus (RSV) is the most important cause of upper and lower respiratory tract infections in infants and children under the age of 2 years and is usually more involved in the development of bronchiolitis and pneumonia than other microorganisms. As the age increases, the prevalence and severity of the disease resulting from this disease decrease. Each year in the United States, the virus causes 90,000 hospitalizations and 4,500 deaths and is found in at least 20% of hospitalized children. The most common clinical

symptoms in RSV patients are coughing, fever, runny nose, vising, and respiratory distress, and in 25% of cases, there is a history of allergies (5). Fever is usually seen at an early stage of the RSV infection, but since it is a transitory symptom, it usually decreases its severity at the time of referral to the treatment center. The incidence of RSV-induced brucellosis is more common in boys than in girls, but there is no statistical relationship between the frequency of clinical symptoms and gender. There was also no significant difference between the mean age of people with a clinical sign and those who did not have the symptoms. In patients with asthma and allergies, RSV is one of the most susceptible cases of visceral attacks and increases the sensitivity of the lungs (6). Most infants with bronchiolitis will recover without any complications, although subsequent follow-up attacks may occur in children hospitalized for bronchiolitis during their breast feeding period. The diagnosis of bronchiolitis is dependent on the doctor's interpretation of the findings of the disease characteristic and is not dependent on any clinical finding or specific diagnostic test. Recommended biopsy and physical examination are the basis for the diagnosis of bronchiolitis (7).

Diagnosis:

Routine laboratory tests do not have the necessary attributes for the diagnosis of bronchiolitis and are not required for confirmation of diagnosis. Mild leukocytosis of 12,000 to 16,000 per microliter is often present but non-specific (8). The count of eosinophils in acute RSV infection is reduced like other infections. However, some patients develop elevated eosinophils, making them more prone to the progression to asthma. The pulse oximeter technique limits the need for an arterial blood sample, except in the case of extreme cases of anxiety (9). Recent studies do not routinely take photos of chest x-ray in infants with bronchiolitis. Although there are abnormalities in the breast picture of most infants with bronchiolitis, they include non-specific findings. There is insufficient information to prove that chest x-ray is associated with severity of bronchiolitis (10). Chest pockets may be normal in mild cases. In moderate to severe cases, a diaphragm is usually flattened or lowered. The atelectasis of the area exhibit pneumonia, although the actual trauma is a rare occurrence. The presence of Atelectasis in the chest radiograph is

indicative of the severity of the disease. The heart usually looks small. The anterolateral diameter of the chest wall increase . In frequent visceral attacks, the initial phase may be shorter and fever and cortisol symptoms appear milder (11). It is not possible to differentiate bronchiolitis from asthma in patients based on chest x-ray findings.

Gene strain tests (usually by immuno-fluorescence or ELISA) from the nasal-thoracic site are the most sensitive tests to confirm the infection in cases of RSV, parainfluenza viruses, influenza viruses and adenoviruses suspicions. The rapid diagnosis of viral agents is also done by PCR technique and is useful for classifying children with bronchiolitis. The diagnosis of bronchiolitis is dependent on the physician's interpretation of the findings of the disease and is not dependent on any clinical findings or diagnostic tests. Recommended biopsy and physical examination are the basis for the diagnosis of bronchiolitis (12).

The main problem for diagnosis of bronchiolitis is the differentiation of other diseases associated with wheezing. Differentiation of asthma from bronchitis is impossible by physical examination, but the age of the onset of the disease, the presence of fever and the absence of a history (personal or family) of asthma are the main factors of differentiation (13). Bronchiolitis occurs primarily in the first year of life and is associated with fever, while asthma usually occurs in older children with periods of wheezing, which usually are not accompanied by fever unless the respiratory tract infection of the asthma attack intensifies. The present wheezing may also come from other causes, including the presence of foreign element in the airway (14).

References:

- [1.] Akbarizadeh MR. Diagnosis of Pediatric Pneumonia-A Review. *Int. J. Adv. Multidiscip. Res.* 2018;5(1):27-31.
- [2.] Akbarizadeh MR. Tuberculosis and Vitamin D relationship-A Review. *Int. J. Adv. Res. Biol. Sci.* 2018;5(1):67-9.
- [3.] Khanbabaee G, Akbarizadeh M, Sayyari A, Ashayeri-Panah M, Abdollahgorji F, Sheibani K, Rezaei N. A survey on pulmonary pathogens and their antibiotic susceptibility among cystic fibrosis patients.

- The Brazilian Journal of Infectious Diseases. 2012 Mar 1;16(2):122-8.
- [4.] Naderifar m, ghaljaei f, akbarizadeh mr, ebrahimi te. An investigation in knowledge, attitude and performance of high school students regarding ecstasy abuse, Zahedan-2008.
- [5.] McKiernan C, Chua LC, Visintainer PF, Allen H. High flow nasal cannulae therapy in infants with bronchiolitis. The Journal of pediatrics. 2010 Apr 1;156(4):634-8.
- [6.] Randolph AG, Meert KL, O'neil ME, Hanson JH, Luckett PM, Arnold JH, Gedeit RG, Cox PN, Roberts JS, Venkataraman ST, Forbes PW. The feasibility of conducting clinical trials in infants and children with acute respiratory failure. American journal of respiratory and critical care medicine. 2003 May 15;167(10):1334-40.
- [7.] Milési C, Baleine J, Matecki S, Durand S, Combes C, Novais AR, Combonie G. Is treatment with a high flow nasal cannula effective in acute viral bronchiolitis? A physiologic study. Intensive care medicine. 2013 Jun 1;39(6):1088-94.
- [8.] Merkus PJ, de Hoog M, Van Gent R, De Jongste JC. DNase treatment for atelectasis in infants with severe respiratory syncytial virus bronchiolitis. European Respiratory Journal. 2001 Oct 1;18(4):734-7.
- [9.] Taber LH, Knight V, Gilbert BE, McClung HW, Wilson SZ, Norton HJ, Thurson JM, Gordon WH, Atmar RL, Schlaudt WR. Ribavirin aerosol treatment of bronchiolitis associated with respiratory syncytial virus infection in infants. Pediatrics. 1983 Nov 1;72(5):613-8.
- [10.] Baraldi E, Lanari M, Manzoni P, Rossi GA, Vandini S, Rimini A, Romagnoli C, Colonna P, Biondi A, Biban P, Chiamenti G. Inter-society consensus document on treatment and prevention of bronchiolitis in newborns and infants. Italian journal of pediatrics. 2014 Dec;40(1):65.
- [11.] Greenough A, Cox S, Alexander J, Lenney W, Turnbull F, Burgess S, Chetcuti PA, Shaw NJ, Woods A, Boorman J, Coles S. Health care utilisation of infants with chronic lung disease, related to hospitalisation for RSV infection. Archives of Disease in Childhood. 2001 Dec 1;85(6):463-8.
- [12.] Cambonie G, Milési C, Jaber S, Amsallem F, Barbotte E, Picaud JC, Matecki S. Nasal continuous positive airway pressure decreases respiratory muscles overload in young infants with severe acute viral bronchiolitis. Intensive care medicine. 2008 Oct 1;34(10):1865-72.
- [13.] Murray J, Bottle A, Sharland M, Modi N, Aylin P, Majeed A, Saxena S, Medicines for Neonates Investigator Group. Risk factors for hospital admission with RSV bronchiolitis in England: a population-based birth cohort study. PloS one. 2014 Feb 26;9(2):e89186.
- [14.] Wainwright C, Altamirano L, Cheney M, Cheney J, Barber S, Price D, Moloney S, Kimberley A, Woolfield N, Cadzow S, Fiumara F. A multicenter, randomized, double-blind, controlled trial of nebulized epinephrine in infants with acute bronchiolitis. New England Journal of Medicine. 2003 Jul 3;349(1):27-35.