Broncho Pulmonary Dysplasia

Symptoms or Behaviors

- Limited tolerance for physical activity
- More rapid, shallow breathing than normal, expending more effort
- Increased susceptibility to respiratory tract infections
- Possible early language delays
- Wheezing
- "Sucked in" ribs
- Cough
- Movement of the chest and abdomen in opposite directions with every breath
- Abnormal posture of neck, shoulders and trunk, reflecting the struggle to breathe

Minnesota Low Incidence Project

About the Disorder

Brocho Pulmonary Dysplasia (BPD) is also known as chronic respirator lung disease. It is sometimes described as an iatrogenic chronic lung disease of infants. An iatrogenic condition is secondary to some type of treatment, in this case the medical intervention at birth in response to the breathing problems experienced by infants with immature lungs. The administration of high concentrations of oxygen by means of ventilators that force oxygen into immature lungs results in cellular changes in the lung tissue, such as thickening of the alveolar ducts and bronchial walls. This damage leads to a reduction in the diameter of the airway and results in the infant having to work considerably harder than normal to obtain sufficient oxygen. BPD may develop in the lungs of infants who have a very low birth weight (less than 52.5 ounces), or those who were born prematurely (before 37 weeks of gestation), regardless of birth weight. However, any newborn infant who has serious respiratory problems in its first few days after birth is at risk of developing BPD. Although it is most common in premature babies, it can occur in full-term infants who need mechanical ventilation and oxygen under pressure. However, many specialists believe that respiratory distress syndrome (RDS) and premature birth are not the only factors in the development of BPD. Rather, BPD appears to reflect the limited ability of a baby's lungs during its first hours and days after birth to respond to adverse situations such as oxygen toxicity, infections, and pneumonia.

Estimates are that as many as 69% of babies who weigh less than 35 ounces and 15% of those who are preterm develop the condition. The incidence of BPD is estimated to be between 7000 and 10,000 cases per year, making it one of the leading causes of chronic lung disease in infants in the U.S., along with cystic fibrosis and asthma.

Although BPD may begin as early as one week of age, it is difficult to diagnose until the baby is fourteen to thirty days old. A diagnosis is based on a history of lung injury in the first days after birth, a continuing need for supplemental oxygen at age twenty-eight days, and persistence of the clinical signs of respiratory difficulty beyond twenty-eight days. An x-ray of the infant's chest may also be an indicator in the diagnosis.

There is no treatment that is specific for BPD. Supportive measures and symptomatic treatment are provided to help BPD infants breathe and give their lungs time to mature. Infant's lungs generally improve gradually through normal repair processes.

BPD is classified as mild, moderate, or severe. Those who have a mild to moderate condition may require bronchodilator treatment, similar to those who have asthma, and diuretic medication, commonly known as "water pills", which increases the excretion of fluid and decreases the accumulation of fluid in the lungs. A child with severe BPD may need a tracheotomy and mechanical ventilatory support for prolonged periods of time. Approximately 18% of all infants with BPD exhibit a severe form of the disease. Anti-inflammatory medications are used long term to reduce airway swelling in more severely ill babies whose wheezing and respiratory distress are occasionally difficult to control with bronchodilators alone. In infants who have severe BPD, other disabilities are common, including epilepsy, deafness, blindness, and cerebral palsy. In addition, children with BPD often have gastroesophageal reflux disease, a condition in which the contents of the stomach leak into the esophagus. Reflux can result in an inflammation of the esophagus which can be painful, and which can result in nausea and bouts of vomiting.

Developed with Minnesota Low Incidence funds, Region 10 Physical Health Disabilities Network, and School Nurse Organization of Minnesota (SNOM)

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Educational Implications

Although the effects of BPD on the respiratory system tend to decrease over time, an estimated 70% of adolescents have continued airway obstruction, and 52% show some signs of airway hyperactivity. Some children continue to have serious chronic respiratory difficulties for the rest of their lives, requiring oxygen therapy on a regular basis. Many children have a limited tolerance for physical exercise, and may need special considerations in school activities. Parents should be informed of any outbreaks of communicable diseases, particularly respiratory infections, so that preventative measures can be taken. Since children with BPD typically breathe at a faster rate, expending more energy, they consequently require additional supplemental nutrients and high-calorie food. School kitchen staff should discuss the student's dietary needs with parents and ensure that proper foods are available. Children who required long-term mechanical ventilation during their first years may show signs of language delay. They may also show signs of growth delay due in part to the effects of poor nutritional status. Reduced height and weight are typically most evident in the middle childhood and adolescent years when body image and acceptance by peers become important issues. School staff should be alert to signs of non-acceptance or teasing. Children with BPD often need ongoing therapy i.e. chest physiotherapy and medication therapy, on a regular basis. There must be assurance that medical services will be provided and staff members trained.

Instructional Strategies and Classroom Accommodations

- Curriculum modifications (extra time for assignments, every other problem, no time limits, alternative ways to test and get information, and resource room)
- Buddy system for notes, teacher outlines
- Absences may require repeated instruction, modified requirements as noted above.
- Tutorial services/homebound instruction when necessary
- Allow student to use restroom whenever necessary, which may be often if the child is on a diuretic medication or medication that increases the production of urine.
- All children should be encouraged to participate in as many physical activities as possible; however alternative activities that do not require as great an expenditure of energy may need to be provided.

Resources

Hill, Jennifer Leigh. (1999) *Meeting the Needs of Students with Special Physical and Health Care Needs.* Prentice Hall.

Parker, James N., M.D. & Parker, Philip M., M.D. Editors. *Official Parents' Sourcebook on Bronchopulmonary Dysplasia.*

NHLBI Information Center
(National Heart, Lung, and Blood Institute)
P.O. Box 30105
Bethesda, MD 20824-0105
(301) 592-8573
Home page:
http://www.nhlbi.hig.gov
Printable information booklet

American Lung Association
1740 Broadway
New York, NY 10019
http://www.lungusa.org
Printable fact sheet

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