

Respiratory syncytial virus (rsv) research paper examples

[Family](#), [Children](#)



Introduction

Respiratory syncytial virus (RSV) is the leading cause of acute lower respiratory tract infections (LRTIs) in infants and young children. The infection is also seen in adults and old individuals, but infants and children are more commonly affected (Krillov, 2011). Infection with RSV accounts for more than 100,000 hospitalizations every year in the US. In US, RSV is a ubiquitous pathogen infecting virtually all children at least once by the time they are three years old. Globally, RSV is associated with 160,000 to 600,000 deaths per year in children alone (Howard, 2000).

Etiology

Prematurely born infants (at 36 weeks or less gestational age) are at a higher risk of getting the infection. For these premature infants, the risk of hospitalization is almost double than that for full-term infants (CDC, 2006). Some other risk factors for acquiring the infection are - chronic lung disease in infancy, hemodynamically significant congenital heart disease, neuromuscular disorders, anatomical abnormalities of the airway, or immunodeficiency with significant T-cell dysfunction. Other than these, exposure to environmental pollutants like passive smoking, minimal breastfeeding by the mother, or multiple birth sets (triplets or more) are also known risk factors. The child often has a family history of asthma or atopy (Krillov, 2011).

Pathophysiology

The infection is limited to the respiratory tract and does not spread systemically. Initial infection involves the lower respiratory tract and manifests itself as acute bronchiolitis. Though the inoculation of the virus is at the upper respiratory tract, it spreads down the respiratory tract through cell - to cell transfer of the virus along intracytoplasmic bridges from the upper to the lower tract (Krillov, 2013). Though the illness begins by showing symptoms of upper respiratory tract, it rapidly involves the small airways characterized by cough, coryza, rales, wheezing, low-grade fever, and a decreased oral intake. Infection of the middle ear (otitis media) is also seen in 40% of the cases. RSV can cause significant morbidity in other age groups too, especially the old and the immunocompromised patients (Krillov, 2011). Reinfection with RSV can also occur in one's lifetime, although the subsequent infections are limited to upper respiratory tracts only, and are milder as compared to the first ever infection (Krillov, 2011).

Presentation

The infant or child suffering from an RSV infection may present with low grade fever, cough, coryza, and/or wheezing. Physical examination may reveal diffuse small airway disease, associated viral or bacterial infection of the middle ear, and dehydration that is assessed by evaluating skin, capillary refill, and mucous membranes (Krillov, 2013).

Studies have also documented increased rates of wheezing over a number of years after a hospitalization for RSV LRTI in infancy (Sigurs, 2005 & Stein, 1999).

Treatment

Current treatment is primarily supportive and aimed at maintaining adequate oxygenation and ventilatory support, and hydrating with administration of intravenous fluids, if necessary (Krillov, 2011). Supportive therapy may also include administration of supplemental oxygen and monitoring oxygen saturation, respiratory rate, and arterial blood gas values (Krillov, 2013). Most infants who are hospitalized with RSV infection cannot have milk or milk feedings; and frequently vomit or spit up. In such a case, a brief course of intravenous (IV) fluids is generally administered in this setting, with resumption of normal feeding as the child recovers (typically over 2-3 days). If the child can take fluids by mouth, the child can be kept at home under parental or care taker supervision, provided there is close physician contact, if needed. Even if the child is hospitalized, supportive therapy is still the mainstay (Krillov, 2013). Even though adults may also suffer from the infection, current pharmacologic approaches to treatment have only focused on infants (Krillov, 2011).

Ribavirin is the only specific antiviral agent that has been approved for the treatment of acute RSV LRTI. The drug is a guanosine analog that interferes with RSV replication and is administered by prolonged aerosol via a small-particle aerosol generator. The recommended dose of Ribavirin is 6g in 300mL of distilled water via a small particle aerosol generator for 12 to 20 hours every day for a couple of days to a week, depending upon clinical response. Owing to a combination of very little clinical benefits from ribavirin treatment, high acquisition cost, the cumbersome route of delivery, and concerns about potential secondary exposure and risk to caretakers,

ribavirin use is extremely limited at present (Ventre, 2004). It may have a place in treatment of RSV infection in severely immunocompromised children when there is a significant risk of mortality due to significant underlying risk factors and severe acute RSV disease (McColl, 1998).

However, subsets of patients seem to benefit from bronchodilator therapy. Sometimes alpha agonists and corticosteroids are also used, but available data does not clearly demonstrate efficacy. If these agents are given, the response to therapy should be documented. If there is no response or limited response, therapy should be discontinued. Pavilizumab is given for prophylaxis (Krilov, 2013).

Prognosis

Hospitalized children are usually discharged in 3 to 4 days. High risk infants need to be hospitalized for a little longer period and have higher rates of ICU admission and mechanical ventilation. However, even in hospitalized children, the mortality rate is less than 1% (Krilov, 2013).

Prevention

Frequent hand washing helps one protect against many infectious diseases, so also an RSV infection. Wiping hard surfaces inside the house with disinfectant may help spread of RSV. The RSV infected child should be kept in isolation and not encouraged to play with other children. A person with cold-like symptoms should stay away from high-risk children. Pavilizumab is a drug of choice to prevent severe RSV illness in certain infants and children who are at high risk. However, the drug cannot cure or treat the illness. It can only help prevent development of serious RSV disease. It cannot even

help in preventing infection with RSV. Currently, no vaccine is available, though research is ongoing (CDC, 2010).

Nursing Interventions

Nurses are always at the forefront of any medical care. They are in a unique position to care for the infant as well as provide an emotional/ psychological support to the families/ caretakers. A nurse can help educate the patient/ family on the infection, its possible mode of infection, and how to cope with it. Nurses can use a holistic nursing approach in providing care while complementing medical practice. Nurses can educate parents on how to identify symptoms that point towards a more serious illness (NHS, 2011). While hospitalized, nurse plays a role in offering general treatment such as cool mist vaporization, administering saline nasal drops, and medication for fever (Goodhue, 2004).

In conclusion, infection with RSV is very common in infants and children, particularly prematurely born infants. The virus affects the lower respiratory tract showing signs of acute bronchiolitis. Even though the disease is common, the mortality rate is less than 1%. Supportive treatment is the mainstay even in hospitalized children, unless the disease is severe. Nurses are of great value in educating the patient/ families on prevention and management of the infection.

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