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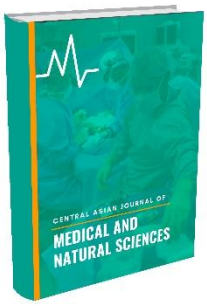

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Severe pneumonia in children

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ABSTRACT: This article presents clinical features of severe pneumonia in children. It deals with presentation and clinical studies.

KEYWORDS: Severe pneumonia, World Health Organization (WHO), Integrated Management of Childhood Illness (IMCI), symptoms, kidney, upper respiratory tract infections (URTI)

INTRODUCTION

Pneumonia is classified as severe when the heart, the kidneys or the circulatory system are at risk of failing, or if the lungs can no longer take in enough oxygen. Treatment with an antibiotic infusion in intensive care is then usually needed, sometimes with artificial respiration or additional drugs such as corticosteroids. Pneumonia is common in childhood-the incidence is 40 per 1000 among children younger than 5 years, with a gradual decline to 7 per 1000 in the early teenage years. Discussion of pneumonia in children is complicated by several factors, such as the overlap in clinical signs and symptoms of bronchiolitis, differences in definitions used in various studies, and the absence of a gold standard diagnostic test.

The causes of pediatric pneumonia vary greatly by age and epidemiological risk factors. The cause of pneumonia can be established in up to 85% of patients in the research setting when multiple diagnostic methods are used. Viral pathogens are particularly important causes of bronchiolitis or pneumonia among children between 4 months and 5 years of age. Important viral pathogens that have been frequently identified include influenza virus, respiratory syncytial virus (RSV), and parainfluenza virus (particularly type 3). Adenovirus occasionally has been associated with severe pneumonia, including recent reports of severe pneumonia secondary to adenovirus 14 infection in previously healthy adults and children.7-9.

It is uncertain whether some of the viruses identified-particularly rhinoviruses detected by polymerase chain reaction (PCR) assay-actually caused lower respiratory tract infection or may have

predisposed the patient to bacterial infection. However, it is certain that previous influenza predisposes children to pneumococcal pneumonia; a case-controlled study demonstrated an odds ratio of 12.4 for influenza-like illness occurring 1 to 4 weeks before hospitalization for severe pneumococcal pneumonia.

When aggressively looked for, concomitant viral and bacterial infections are identified in more than 30% of patients. In a study of 254 hospitalized children, the most commonly identified bacterial pathogen was Streptococcus pneumonia (in 37%), followed by Haemophilus influenza (in 9%, type not reported) and Mycoplasma pneumonia (in 7%). Although more than 50% of cases of pneumonia may be attributed to Mycoplasma or Chlamydiophilia in children older than 5 years, more than 90% of these children are treated as outpatients. Up to one third of children with M pneumonia infections are confected with severe pneumonia.

These pneumonia classification and management guidelines had been developed based on evidence generated in the 1970s and early 1980s, and were incorporated into the original version of Integrated Management of Childhood Illness (IMCI). In the intervening time, new evidence has emerged which prompted the development of revised guidelines. The original guidelines classified the respiratory symptoms of children 2 to 59 months of age into four categories. Children with cough and cold who did not have signs of pneumonia were classified as “no pneumonia”, and their caregivers were advised on appropriate home care. Children with fast breathing were classified as “pneumonia” and were given an oral antibiotic (at that time oral cotrimoxazole) to take at home for five days. Children who had chest in drawing with or without fast breathing were classified as “severe pneumonia” and were referred to the closest health facility for treatment with injectable penicillin. Children who had any general danger signs were classified as “severe pneumonia or very severe disease”. These children received a first dose of oral antibiotic and were then urgently referred to a health facility for further evaluation and treatment with parenteral antibiotics.

In case of severe Pneumonia child needs immediate hospitalization. In case of respiratory distress (severe lower chest wall indrawing or a respiratory rate of ≥ 70/ min), oxygen support may be given to maintain saturation. During first line of treatment benzyl penicillin (50 000 units/kg IM or IV, 6 hourly) will be administered for at least 3 days. High grades of fever will be managed with paracetamol. If wheezing sound is present, rapidacting bronchodilator gives relief. Hydration should be maintained with fluids. After symptomatic relief, patients may be switched to oral amoxicillin (25 mg/kg twice a day). The total course of antibiotic treatment takes 5 to 7 days. In case non-response to treatment up to 48 hours, or patients starts deteriorating treatment modalities should be chosen accordingly. If there are no apparent complications observed, patients may be switch to chloramphenicol (25 mg/kg every 8 h) until the child has improved. Despite of hospitalization and available treatment options for pneumonia, it is a leading cause of infant death in developing countries.

METHODS

The committee for The Japanese Respiratory Society guidelines for the management of respiratory infections employed a classification method to assess the severity of pneumonia based on physical examination and pathological results. This method was adopted in accordance with the assessment criteria for response to antimicrobial drugs by the Japanese Society of Chemotherapy. No clear correlation was drawn, however, between severity and outcome for the patient. In these guidelines, the

severity is classified based on the following: symptoms, physical examination, and demographic factors from the standpoint of vital prognosis for patients with pneumonia.

A peripherally inserted central venous catheter often facilitates intravenous administration of antibiotics at home. The total duration of therapy is often approximately 2 weeks after the patient becomes afebrile; however, prolonged treatment is often required in patients who have lung abscesses.

RESULTS

The mortality rate associated with pneumococcal pneumonia among children is low. In large studies, mortality rates ranged from 2.3% to 2.7%, with death directly attributable to pneumococcal pneumonia in fewer than 1%.15,33,34 The mortality rate in children younger than 2 years was 3.5% but fell to 1.7% in children between the ages of 2 and 17 years.

A total of 107 children with severe pneumonia were included in study and their parents/caretakers were interviewed. Out of 107, 22 (20.6%) were lived in urban and 85 (79.4%) were in rural areas ($p<0.05$). The male patients were accounted for 58 (54.2%) with male to female ratio of 1.18:1. It was found that the majority of the mothers were illiterate, housewives and fathers had learned up to 6thgrade. Among 107 children, 56 (52.34%) were fully vaccinated as per WHO guidelines, 42 (39.25%) were partially vaccinated and 9 (8.41%) were not vaccinated at all. Among the children 67.3% lived in thatched roof houses, while 31.8% lived in corrugated iron roofed houses and only 1 child was homeless. Majority of children lived in a family of greater than 6 people living together. Children were lived in houses with kitchen in the living room accounted 61.7% . Among the children, 79 (73.8%) were received exclusive breast feeding. It was also observed that 6 subjects (5.6%) were sero-positive for HIV. Malnutrition was prevalent in the subjects and about 43.0% (46) were suffering from malnutrition and 5.6% (6/107) with severe malnutrition. It was interesting to see that about 48.6% (52) of the pneumonic children had at least one family member with symptoms of URTI and 11.2% (12) had history of previous history of pneumonia. Only 7.5% (8/107) of the children had history of cigarette smoker coresidents.

Data shows that the majority of childhood pneumonia deaths are due to severe pneumonia/severe disease management of these cases requires early identification, prompt referral and the availability of good-quality higher-level care. However, in many low-resource settings, referral is difficult and often does not take place (11–15). On the basis of this information, WHO undertook a review of the evidence, with the aim of developing a simplified approach that could increase the number of children receiving correct treatment for pneumonia.

CONCLUSION

All in all, the recruited patients examined and parents/caretakers were interviewed to know the living conditions of the patients, socioeconomic status, associated risk factors and their clinical and treatment history were recorded to evaluate the treatment outcome with respect to variables as follows:

Age, sex, place of residence, family income, maternal occupation, paternal occupation, maternal educational status, paternal education status, housing/living conditions, nutritional status, immunization status, parental smoking, older family member, breast feeding status, duration of illness, duration of hospital stay.

The risk factors for poor outcome in childhood pneumonia include rural residence and poor infrastructure, parental literacy rate, vaccinated, national status, household environment, co-residents

with URTI. Parental education, diet counseling, avoidance to contact with infected person will reduce the prevalence of pneumonia and will be helpful in better hospitalization outcomes.

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