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A Retrospective Chart Review of Pediatric Complicated Community-Acquired Pneumonia: An Experience in the Al Qassimi Women and Children Hospital

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Background

Community-acquired pneumonia (CAP) is one of the most common global health issues. Even though many vaccinations and new diagnostic tools are available, CAP has a higher mortality rate, especially in children less than five years of age. Complicated CAP (CCAP) in a healthy child is a severe disease characterized by a combination of local complications, such as parapneumonic effusion (PPE), empyema (EMP), necrotizing pneumonia (NP), abscess, pneumothorax, and bronchopleural fistula, and systemic complications, such as bacteremia, metastatic infection, multiorgan failure, acute respiratory distress syndrome, disseminated intravascular coagulation, and, rarely, death. This study describes the demographic features, clinical presentation, management, and outcomes of patients diagnosed with CCAP at the Al Qassimi Women's and Children's Hospital (AQWCH).

Methodology

This retrospective chart review aims to collect and explore the data of all previously healthy children admitted with CCAP between the ages of one month and 13 years at AQWCH from January 2018 to December 2020. The primary study outcome measure is to provide clinicians with the diagnostics, evaluation, and management required to treat complicated pneumonia.

Results

A total of 195 patients were diagnosed with CAP, of whom 30 (15.3%) were diagnosed with CCAP. Of these, 14 (46.6%) patients had NP, eight (26.7%) had PPE, and eight (26.7%) had EMP. The median age of patients was 2.5 years, with 13 (43%) males and 17 (57%) females. The median duration of their stay in the hospital was 16 days. All patients were vaccinated with Hib, PCV13, or PCV7, and 57% of the patients received antibiotics before admission. The most common findings were consolidation and pleural effusion. Blood culture was

negative in all cases, and pleural culture was positive only in three cases. A total of 17 (57%) patients underwent video-assisted thoracoscopic surgery (VATS), and post-VATS surgical emphysema was found to be the most common complication. Chest X-rays normalized after three months in 65% of patients.

On comparing patients who were admitted to the Pediatric Intensive Care Unit (PICU) before any surgical intervention with those who were not, it was found that patients who required PICU admission were young (median = 2 years; interquartile range (IQR) = 1-4.5; $p = 0.044$) and had higher respiratory rate (mean = 49 breaths/per minute, standard deviation (SD) = 11; $p = 0.000$). In addition, they had lower median albumin (median = 2 g/L; IQR = 1.8-2.23; $p = 0.004$).

On comparing patients who required VATS and those who did not require VATS, it was found that the former had a higher median respiratory rate (48 per min; range = 42-54; $p = 0.01$). A cavity in the chest computed tomography (CT) was found in 86% of patients with VATS ($p = 0.017$), and they had lower median albumin (median = 2 g/L; IQR = 1.92-2.24; $p = 0.012$), as well as longer median duration of using oral antibiotics (median = 21 days; IQR = 19-26; $p = 0.025$).

Patients with complicated NP had a higher respiratory rate and higher PICU admission, and more cavity in the chest was found in the CT study. Most NP patients also underwent VATS and had longer median days of using oral antibiotics. One patient developed a bronchopleural fistula, and one patient diagnosed with NP died.

Conclusions

CCAP is a major cause of hospitalization in children. It is important to suspect CCAP in all CAP patients not responding to treatment after 48-72 hours.