Abstract

Background: Patients with complicated pneumonia (CPN) are traditionally worked up with chest computed tomography (CT) scan. The CT scan is the diagnostic and therapeutic management of complicated pneumonia, with resultant high associated costs. Since CT is a non-invasive technique with high sensitivity and specificity, it is considered the diagnostic tool of choice for complicated pneumonia. However, with the rise in health care costs, a cost-effective strategy is needed. This study compared the diagnostic tool of CT scan versus chest ultrasonography (US) for complicated pneumonia.

Methods

We performed a retrospective study of a single institution's patients from January 2010 to December 2013. Patients were included if they were <18 years of age and admitted for complicated pneumonia, defined as (a) parapneumonic effusion, multilobar disease, abscess or cavities, necrotizing pneumonia, (b) high fever, shortness of breath, chest pain, and (c) need for chest tube insertion. The demographic and clinical characteristics of patients were identified from hospital electronic health records. The study was approved by the Institutional Review Board of our institution and all patients were included in the study. The main outcomes were the comparison of chest US with chest CT in the diagnosis of complicated pneumonia.

Results

The study population included 50 patients (25 chest US and 25 chest CT). The US group had a significantly lower cost than the CT group ($5,000 vs. $25,000, p < 0.001). The US group had no significant difference in clinical outcomes, including length of stay (9 vs. 11 days, p = 0.675), need for chest tube insertion (10% vs. 43%, p = 0.152), and need for antibiotics (41% vs. 82%, p = 0.001). The US group had a statistically significant decrease in CT scan use (p < 0.001).

Summary and Conclusion:

Our study shows that chest US can be used as an alternative diagnostic and therapeutic tool for complicated pneumonia, resulting in a lower cost, reduced radiation exposure, and no significant difference in clinical outcomes compared to chest CT. We conclude that US is a cost-effective diagnostic tool for complicated pneumonia.

References: