

# Evaluation of the Cost Effectiveness of Cefuroxime versus Penicillin G for the Treatment of Bacterial Pneumonia in Children

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## Abstract

This retrospective study was performed at the Pediatric Institute of Kuala Lumpur General Hospital. A total of 147 subjects with radiologically confirmed pneumonia were recruited in the study. Data collected included patient demographics, length of stay (LOS), clinical outcomes and all the components of direct medical cost. Bottom up costing method was used for cost evaluation from hospital perspectives. The clinical outcome that considered as a measure of effectiveness was the probability of treatment success which is the percentage of patients discharged with complete cure (symptoms free). Cost effectiveness and incremental cost effectiveness ratios were calculated. The two antibiotics considered for the analysis were the cefuroxime and the C-penicillin. For the cefuroxime group, the median of the total management cost is MYR -Malaysian Ringgit 838.90 (IQR. 787.90, 1834.57), for the C-penicillin group the median is MYR 1153.85 (IQR 791.61, 1523.90). Cefuroxime use resulted in better patient outcome (84% versus 73% treatment success rate) and at lower cost. The cost adequacy proportion for cefuroxime and C-penicillin are 998.70, and 1580.60 individually. The ICER (gradual savvy proportion) is equivalent to - 2,863, less estimation of ICER demonstrate sparing impacts. The utilization of Cefuroxime for the treatment of youngsters hospitalized with bacterial pneumonia is clinically more viable and gives a monetary favorable position contrasted with Crystalline Penicillin G. Community-acquired pneumonias the most widely recognized reason for death in youngsters around the world, representing 15% of passings in kids more youthful than 5 years old. About 1 of every 500 kids will be hospitalized for CAP, which makes a generous financial weight. Top is in this manner essential to analyze and properly treat. While viral reasons for CAP are generally normal, separating viral versus bacterial etiologies can be troublesome. This leads to excessive use of antimicrobial medications or susceptibility to feeling a pressure to prescribe. Overall, in the United States, 11.4 million antimicrobial prescriptions for pediatric respiratory tract infections per year are avoidable. Besides, wide range yet less successful antimicrobial specialists are regularly recommended when pharmacokinetically great restricted range operators are accessible. Ostensibly, the untoward impacts of overtreatment of CAP in those in whom treatment is ridiculous aggravates the dismalness of this ailment procedure. Due to mounting information on antimicrobial symptoms, opposition, and microbiome impacts, professionals must stick to the standards of reasonable use when rewarding CAP. Pneumonia is the single most prominent reason for death in youngsters around the world, with an expected 1.3 million passings in 2011 and over 90% happening in creating nations. It is responsible for 4% of deaths in newborns and 14% of deaths in pediatric patients. The occurrence of CAP is lower in created nations: in the US it is

around 35–40/1000/man a long time in youngsters < 5 years of age, 20/1000 man a very long time in kids 5–10 years of age, and 10/1000 man a very long time in kids > 10 years of age. Notwithstanding this, around half of youngsters with CAP < 5 years of age, 20% between 5–10 years of age, and 10% of kids > 10 years of age should be hospitalized. These numbers show the weight that CAP speaks to for society and for monetary medicinal services assets. In the initial segment of the investigation, we thought about the most recent national and universal rules on pediatric CAP.

At that point we played out a pursuit on PubMed and Scopus databases, searching for examines distributed from 2010 to 2016 about CAP antimicrobial treatment in kids, attempting to get information from however many various nations as could reasonably be expected. We additionally performed hand-search of references of important articles. Our inquiry included both review and planned investigations, for the most part cross-sectional and clinic based, including the two inpatients and outpatients. Every one of them with the exception of one included pediatric patient in particular.

To get a broader survey of CAP recommending conduct, for those nations where explicit investigations on antimicrobial solutions for CAP were not accessible, a quest for articles on antimicrobial remedies in pediatric age bunches was performed. All articles including CAP as explanation behind treatment were incorporated. Living beings liable for CAP change delineating youngsters by age as a result of the creating safe framework and age-related presentations: infections or blended diseases are more normal among more youthful patients (kids under 5 years old), while selective bacterial cause and atypical etiology (essentially *Mycoplasma pneumoniae*) are all the more frequently distinguished in more seasoned kids. *S. pneumoniae* and *Haemophilus influenzae* are the commonest bacterial microorganisms confined in youngsters under five years with CAP representing 30%–half and 10%–30%, individually. Around 50% of deaths due to pneumonia are attributable to these organisms.

Viral etiology has been archived in up to 80% of CAP cases in kids more youthful than 2 years and significantly less in more established youngsters (10–16 years). The most oftentimes recognized viral microbe in more youthful youngsters is Respiratory Syncytial Virus (RSV), infrequently distinguished in more established kids. Less frequent are Adenoviruses, Bocavirus, Human Metapneumovirus, Influenza A and B Viruses, Parainfluenza Viruses, Coronaviruses, and Rhinovirus. Up to 33% of hospitalized kids are at the same time contaminated by at least 2 infections. Mixed infections have been documented in

2–50% of children with CAP, more frequently in inpatients, which are more seriously ill than outpatients.

Atypical pneumonia brought about by various microbes is portrayed by an alternate clinical course: gradually advancing, with disquietude, sore throat, poor quality fever, and hack creating more than 3–5 days. The main organisms responsible for atypical pneumonia are *M. pneumoniae* in older children and *C. pneumoniae* in infants. *Legionella* species are rarely identified in children. The etiologic definition is hard for some reasons, for example, low yield of blood societies, trouble in getting satisfactory sputum examples from more youthful

youngsters, visit example pollutions by upper aviation routes bacterial verdure and obtrusiveness of pneumonic biopsy, lung yearning, and bronchoalveolar lavage which are infrequently performed. In any case, in the course of the most recent 10 years, there have been enhancements in PCR procedures for viral recognizable proof on nasopharyngeal suction or discharge, and sub-atomic measures are currently usually utilized in Europe and in the US. Vaccines are the most effective strategy for prevention of pediatric CAP. *Haemophilus influenzae* type B conjugate vaccine and 7-valent pneumococcal conjugate vaccines dramatically decreased the incidence of bacterial CAP after introduction of universal vaccination campaigns.