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Antibiotics in childhood pneumonia: how long is long enough?

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Abstract

Improved access to healthcare, vaccines and treatment with antibiotics has reduced global mortality from childhood community-acquired pneumonia. However, as respiratory viruses are responsible for most episodes of pneumonia, important questions remain over who should receive these agents and the length of each treatment course. Worldwide concerns with increasing antibiotic resistance in respiratory pathogens and appeals for more prudent antibiotic prescribing provide further urgency to these clinical questions. Unfortunately, guidelines for treatment duration in particular are based upon limited (and often weak) evidence, resulting in national and international guidelines recommending treatment courses for uncomplicated pneumonia ranging from 3 to 10 days. The advantages of short-course therapy include a lower risk of developing antibiotic resistance, improved adherence, fewer adverse drug effects, and reduced costs. The risks include treatment failure, leading to increased short- or long-term morbidity, or even death. The initial challenge is how to distinguish between bacterial and non-bacterial causes of pneumonia and then to undertake adequately powered randomised-controlled trials of varying antibiotic treatment durations in children who are most likely to have bacterial pneumonia. Meanwhile, healthcare workers should recognise the limitations of current pneumonia treatment guidelines and remember that antibiotic course duration is also determined by the child's response to therapy.

Keywords: Pneumonia, Antibiotics, Child

Community-acquired pneumonia is the leading global cause of childhood morbidity and mortality. Annually, there are an estimated 120–160 million clinical pneumonia episodes worldwide, causing 14 million hospitalisations and almost one million deaths in children aged <5 years [1, 2]. Although respiratory viruses are the most common pathogens associated with childhood pneumonia, most deaths are attributed to *Streptococcus pneumoniae* and *Haemophilus influenzae* type b [3]. Consequently, antibiotics have reduced pneumonia-related morbidity and mortality. Nevertheless, several knowledge gaps exist with prescribing antibiotics for pneumonia, including the optimal length of treatment required. These limitations are evident in both national and international guidelines, which have had to rely upon expert opinion and weak levels of evidence from a small number of clinical trials with substantial methodological limitations [4–7]. A good example of these difficulties is the range of recommendations provided on treatment duration for uncomplicated childhood pneumonia [5, 6]. This raises several questions for healthcare workers when determining how long they should be giving antibiotics to a child with pneumonia.

What factors influence decisions on antibiotic duration?

Several factors are considered when both choosing an antibiotic to treat a suspected case of bacterial pneumonia and determining how long it should be given. These include: (i) clinical presentation and severity; (ii) assumed bacterial aetiology based upon the child's age, vaccination status, underlying co-morbidities and the local pathogen antibiotic susceptibility profiles; and (iii) cost, availability, tolerability, and ease of administration (e.g. frequency and palatability) of the chosen agent that may influence treatment adherence.

In clinical practice, the optimal duration of antibiotic treatment depends upon whether the pneumonia is straightforward or complicated (e.g. empyema or systemic

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