



## The use of ampicillin monotherapy remains appropriate in children with pneumonia at Patan Hospital, Nepal

Reference: Pokhrel B, Koirala T, Gautam D, Kumar A, Camara BS, Saw S, Dahi SK, Gurung S, Khulal A, Yadav SK, Baral P, Gurung M, Shrestha S. Antibiotic Use and Treatment Outcomes among Children with Community-Acquired Pneumonia Admitted to a Tertiary Care Public Hospital in Nepal. Trop Med Infect Dis. 2021 Apr 20;6(2):55.

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### Key Messages

- Ampicillin remains appropriate as first-line treatment for children with community-acquired pneumonia. Of 659 under-five children admitted at Patan Hospital in Nepal from 2017-2019, 70% were treated with ampicillin with excellent treatment outcomes.
- The yield of blood culture and chest X-ray was low. Thus, the routine use of culture and X-ray may not be needed in most children hospitalised with pneumonia in non-intensive care settings. Such investigations may be reserved in severe pneumonia cases.
- Two-thirds of children with pneumonia did not meet the criteria for severe pneumonia as per the World Health Organization (WHO) classification and hence could have been managed with oral antibiotics in primary care centres.

### What is the problem and why is it important?

Pneumonia is the most common cause of under-five child mortality in low- and middle-income countries. Due to lack of appropriate diagnostic tests like polymerase chain reaction (PCR) in low-resource settings to diagnose viral infections, most childhood infections like pneumonia are assumed to be caused by bacteria and treated with antibiotics. Many parents buy antibiotics for their children over-the-counter at local pharmacies, but visit the hospital when self-medication fails. The WHO and the American Academy of Pediatrics recommend using ampicillin as the first-line antibiotic in hospitalised children with pneumonia. Yet, health care providers often perceive ampicillin as ineffective because of high levels of antibiotic resistance, resulting in overuse of reserve antibiotics and consequent increase in resistance. In this study, we report antibiotics used to treat childhood pneumonia at Patan Hospital and treatment outcomes.

## How did we measure it?

This study was based on a large sample of 659 children admitted to Patan Hospital with the diagnosis of community-acquired pneumonia over three years (2017-2019). We used routinely-collected hospital data from electronic records and paper-based patient files. As Patan Hospital is a WHO surveillance centre for invasive bacterial disease (e.g., pneumonia, sepsis and meningitis), these data are of high-quality, valid and reliable.

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## What did we find?

- All children (except two) were treated with injectable antibiotics. While 70% of children got ampicillin monotherapy, a total of 23 different drug regimens were used for treatment.
- 99% of all children recovered without any sequelae.
- All children had a blood culture performed and a chest X-ray taken. However, the yield for blood culture was low (<1%) and 68% had a normal chest X-ray.
- Two-thirds of the children had non-severe pneumonia.
- 30% of the children had used antibiotics before coming to the hospital.

## Implications

- Paediatricians at Patan Hospital should use ampicillin monotherapy in children with pneumonia, as it led to good treatment outcomes (despite high levels of antibiotic use before coming to the hospital).
- Paediatricians should use blood culture and chest X-ray rationally, given the yield of blood culture and chest X-ray were low.
- Patan Hospital should use strict admission criteria to avoid unnecessary hospital admission and the use of injectable antibiotics, as many children admitted to Patan Hospital had non-severe pneumonia and did not meet WHO admission criteria.
- Patan Hospital should use a standard treatment protocol, as this study showed use of 23 different antibiotic regimens.
- Implementation of policies to prohibit the sale of antibiotics over-the-counter should be strengthened to prevent inappropriate antibiotic use and antimicrobial resistance. In this study, 30% of all children had used antibiotics before coming to the hospital, which indicates the easy access to antibiotics as over-the-counter drugs.
- Diagnostic tests like PCR should be provided to help distinguish bacterial from viral pneumonias, especially in children with non-severe illness to prevent unnecessary admission and inappropriate use of antibiotics.