

Treating Childhood Pneumonia Empirically: Several Issues Still Remain!

ZULFIQAR A BHUTTA

*Husein Lalji Dewraj Professor & Chairman, Department of Paediatrics & Child Health,
The Aga Khan University, Karachi, Pakistan.
E mail: zulfiqar.bhutta@aku.edu*

Pneumonia is now widely regarded as the dominant cause of child mortality in the developing world with over 150 million cases and almost 2.4 million deaths annually(1). Although there are remarkable advances in preventive strategies including nutrition interventions such as promotion of exclusive breastfeeding, environmental control such as reduction of indoor air pollution and newer effective vaccines(2), antibiotic therapy remains the mainstay of management and treatment strategies(3).

In this issue of *Indian Pediatrics*, Zhang, *et al.*(4) from the University of Rio Grande (Brazil) present their evaluation of empiric antibiotic therapy based on a retrospective evaluation of data from a cohort of children (29 d - 12 yr of age) admitted with community acquired pneumonia between 1991-2001. Notwithstanding the relatively higher rates of treatment failure observed from 1999-2001, the overall treatment success rates were close to 95%, suggesting that their strategy of empiric therapy worked. However, these findings are difficult to interpret and extrapolate to community settings, as population denominators and cause specific mortality rates are not provided. Only 4% of cases with either pleural effusion or more severe disease had cultures obtained and the relatively high rates of positive cultures (61%) in this group do suggest that these represented a subgroup of relatively severe disease. The choice of antibiotics and reasons for therapeutic changes are also unclearly defined, indicating that a variety of management protocols, if any, were in place over this time. It is therefore unclear if the empiric therapy protocols were influenced by adequate knowledge of the background rates of antimicrobial resistance, other case management strategies or therapeutic recommendations in Rio Grande over this period of time. As indicated by Graham, *et al.*(5), the greatest potential for reducing pneumonia-related deaths in health facilities is wider implementation of the current

guidelines built around a few core activities such as training of healthcare providers, appropriate antibiotics and availability of oxygen.

Given the difficulties in obtaining appropriate microbiological information in a timely manner among children with community-acquired pneumonia, it is imperative that the choice of empirical antibiotics is based on sound knowledge of common bacterial pathogens and sensitivities in the region. There is strong evidence of emerging resistance among common organisms causing pneumonia from a variety of community settings(6,7), and these should inform policy for the choice of empirical therapy. In areas with special problems such as resistance of common respiratory bacterial pathogens such as *Streptococcus pneumoniae* and *Hemophilus influenzae* to first line antibiotics(8) and emergence of methicillin-resistant *Staphylococcus* infections(9) in community settings, antibiotic choices must be based on available local data.

This approach does require adequate availability of surveillance information as well as systematic collection of local and regional microbiological information. The fact that our current clinical criteria for the diagnosis of pneumonia may also include a substantial proportion with non-bacterial lower respiratory infections, criteria for recognizing and instituting empirical antibiotic therapy must be developed carefully and periodically reviewed. However, once developed, such evidence-based protocols for the recognition and treatment of childhood pneumonia must be implemented at scale in close coordination between community-based outreach services as well as referral facilities. Data and facility-based case series such as the one reported by Zhang, *et al.*(4) are an extremely important step in this direction and must be coupled with triangulation from additional health system information including periodic microbiological

surveillance. This must lead to a careful strategy of avoiding large scale *carte blanche* administration of antibiotics on empirical grounds while ensuring that there is no inordinate delay in instituting appropriate treatment. This balancing of "access and excess" is key in ensuring that we save lives today and also avoid the specter of multi-drug resistant infections tomorrow(10).

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REFERENCES

1. World Health Organization. Global Action Plan for the Prevention and Control of Pneumonia (GAPP). Report of an informal consultation, La Mainaz, Gex, France: March 5-7, 2007.
2. Mulholland EK, Smith L, Carneiro I, Becher H, Lehmann D. Equity and child survival strategies. *Bull World Health Organ* 2008; 86: 399-407.
3. Bhutta ZA. Managing severe pneumonia in developing countries. *BMJ* 2008; 336: 57-58.
4. Zhang L, Lovatel R, Nicolette D, Sinzkel E, Matiello J, Staszko K, *et al.* Empiric antibiotic therapy in children with community-acquired pneumonia. *Indian Pediatr* 2008; 45: 554-558.
5. Graham SM, English M, Hazir T, Enarson P, Duke T. Challenges to improving case management of childhood pneumonia at health facilities in resource-limited settings. *Bull WHO* 2008; 86: 349-355.
6. Bhutta ZA. Dealing with childhood pneumonia in developing countries: how can we make a difference? *Arch Dis Child* 2007; 92: 286-288.
7. Atkinson M, Lakhanpaul M, Smyth A, Vyas H, Weston V, Sithole J, *et al.* Comparison of oral amoxicillin and intravenous benzyl penicillin for community acquired pneumonia in children (PIVOT trial): a multicentre pragmatic randomised controlled equivalence trial. *Thorax* 2007; 62: 1102-1106.
8. Jeena P, Thea DM, MacLeod WB, Chisaka N, Fox MP, Coovadia HM, *et al.* Failure of standard antimicrobial therapy in children aged 3-59 months with mild or asymptomatic HIV infection and severe pneumonia. *Bull World Health Organ* 2006; 84: 269-275.
9. Hageman JC, Uyeki TM, Francis JS, Jernigan DB, Wheeler JG, Bridges CB, *et al.* Severe community-acquired pneumonia due to *Staphylococcus aureus*, 2003-04 influenza season. *Emerg Infect Dis* 2006;12: 894-889.
10. Bhutta ZA. Drug resistant infections in developing countries: a major burden on children. *BMJ*, doi:10.1136/bmj.39520.680718.94. Accessed 8 April 2008.