Dealing with childhood pneumonia in developing countries: how can we make a difference?

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doi:10.1136/adc.2006.111849

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For any doctor meningococcal disease remains a rarity, and expertise in its recognition is not common among those in the front line. However, careful assessment of all children with abnormal vital signs may lead to earlier recognition of meningococcal sepsis and application of the new edition of the meningococcal treatment algorithm described here may help in the early management of critically ill patients with meningococcal disease. We hope and believe that this approach to management of children with meningococcal disease is making a difference.

ACKNOWLEDGEMENTS
We thank the Meningitis Research Foundation for their support in printing and widening, distributing the algorithm and especially Linda Glennie.

Arch Dis Child 2007;92:283–286.
doi: 10.1136/adc.2006.102384

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Childhood pneumonia

Dealing with childhood pneumonia in developing countries: how can we make a difference?

Zulfiqar A Bhutta

Perspective on the paper by Hazir et al (see page 291)

The past few years have seen renewed attention focused on the persistent burden of childhood mortality globally. Of the 10.6 million deaths of children under 5 every year, the vast majority occur in a mere 42 countries of the developing world. It is also apparent that despite advances in understanding the pathophysiology and significance of the major causes of child death, most of the known killers such as diarrhoeal disorders and acute respiratory infections (ARI) still continue to take a heavy toll.1

Most of the deaths from ARI are due to pneumonia. The annual incidence of pneumonia is estimated at 151 million new cases per year, of which 11–20 million (7–13%) cases are severe enough to require hospitalisation.2 Serious neonatal infections account for 30–50% of neonatal mortality in different regions and it is difficult to disentangle sepsis and deaths from pneumonia. With the inclusion of neonatal pneumonia, recent estimates indicate that pneumonia is the single largest contributor to child mortality, accounting for almost 28–34% of all under-5 deaths globally.3 It is also important to note that in contrast to diarrhoeal deaths where mortality rates have reduced dramatically, despite the introduction of a global programme for the control of ARI almost 15 years ago, there has been little change in overall burden of deaths from pneumonia. Figure 1 shows estimates of deaths of children under 5 from pneumonia, and although recent figures represent improvements in estimates rather than increasing trends, it is evident that the global burden of deaths

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from pneumonia remains unchanged. These composite figures also hide the enormous differentials that exist in ARI mortality rates between countries and between various socioeconomic groups within countries. The bulk of deaths from childhood pneumonia affect the poor who have higher exposure rates to risk factors for developing ARI such as overcrowding, poor environmental conditions, malnutrition and also limited access to curative services.

Such issues of access to preventive and curative services are the main driving force behind revised strategies for reducing the burden of deaths due to childhood pneumonia in developing countries. Although classic clinical detection algorithms and management strategies for ARI have largely relied on management in health facilities, there is increasing recognition of the importance of reaching the poor in community settings. These strategies involve recognising and managing pneumonia in community settings through community health workers (CHWs). Notwithstanding emerging evidence of the feasibility and effect of ambulatory management of pneumonia by CHWs, there are several issues that merit careful consideration as this strategy is scaled up. Two key questions are whether current algorithms for clinical diagnosis of pneumonia are robust, and if so, are current antibiotic regimens adequate for the treatment of pneumonia in primary care settings?

These questions have been answered to some extent by Hazir et al in the current issue of *Archives*. Although it is reassuring that the currently recommended dose of co-trimoxazole was effective in most cases, it is uncertain whether the clinical criteria used by health workers correctly identified most cases of bacterial pneumonia. Recent studies by the same group in a consecutive group of children diagnosed with non-severe and severe pneumonia in ambulatory settings showed that only 14% had radiologically confirmed pneumonia. Thus it is possible that current diagnostic criteria for non-severe pneumonia may pick up a significant proportion of children with viral lower respiratory infections, which may not need antibiotic treatment at all. Given the lack of specificity of clinical features, it is also difficult to envisage that CHWs and other health workers will be able to readily diagnose pneumonia on clinical criteria alone without ancillary diagnostic tools or aids. Given the desire to reduce mortality from pneumonia, public health-policy makers have accepted some overdiagnosis as inevitable in this regard. However, as such treatment regimens and antibiotic use are scaled up in population settings by CHWs, there are implications for public health policy that must be considered.

Few studies on antimicrobial treatment of pneumonia include concomitant microbiological information, and although there is substantial evidence from recent in vitro studies to indicate that resistance to commonly used antibiotics is increasing, most studies on treatment have relied on clinical failure rates to assess this aspect. Table 1 indicates treatment failure rates among children with non-severe pneumonia treated with various regimens over the past 15 years with treatment failure rates ranging from 10% to 23%.

Although the differences in clinical response rates in some of these studies may relate to different patient populations and variable application of clinical diagnostic criteria, they may also represent genuine differences in antimicrobial resistance patterns. Notwithstanding the findings by Hazir et al, further studies on the efficacy of amoxicillin are needed in children with radiologically confirmed pneumonia.

These findings underscore the continued need for preventive strategies, as well as alternative improved diagnostic and treatment regimens. Clinical approaches for the management of childhood pneumonia are considerably hampered by the lack of a gold standard, as classic microbiological methods have poor sensitivity and current algorithms lack sufficient specificity. It is therefore likely that community strategies for the recognition and management of pneumonia by ancillary health workers that rely on simple clinical criteria, other than auscultation, will overdiagnose bacterial pneumonia. There are legitimate concerns that widespread use of first-line antibiotics for all ARIs will lead to loss of effectiveness.

Table 1 summarises the outcomes from recent therapeutic trials for the treatment of non-severe pneumonia, indicating treatment failure rates exceeding 15% in many cases. It is therefore imperative that antibiotic regimens for both dosage and duration be evidence based and their use restricted as much as possible.

It is therefore important that developing countries look at a combination of strategies for reducing the burden and mortality from pneumonia. These include the important role of preventive strategies such as control of environmental factors (eg, indoor air pollution) dealing with prevalent micronutrient deficiencies such as zinc and vitamin A deficiencies and promotion of household behaviours such as exclusive breast feeding and hand washing. Many of these preventive strategies have health benefits that far
Children under pressure

Saverio Stranges, Francesco P Cappuccio

Perspective on the paper by Jackson et al (see page 298)

The study by Jackson et al represents a significant contribution to our knowledge in the area of hypertension research and related clinical practice. The definition of national blood pressure references for children and young adults, aged 4–23 years, living in Great Britain provides important, complementary information to the updated US guidelines on the management of high blood pressure in children and adolescents aged 1–17 years, as well as to earlier attempts to define normative blood pressure values from other countries. In addition, these centiles will integrate existing charts in the UK regarding other important parameters (eg, body mass index), thereby allowing a more comprehensive characterisation of the health of children. Some distinctive aspects of the study by Jackson et al should be highlighted: the representative and large sample size of the seven surveys from which blood pressure data were drawn; the consistent method applied for blood pressure measurements; the use of a statistical technique such as the LMS method to construct blood pressure centiles, which accounts for the skewness (L), median (M), and coefficient of variation (S) of the blood pressure distribution. Indeed, this statistical tool had been previously used in a German study to derive normalised reference values for the 24-h ambulatory blood pressure in children and adolescents aged 5–20 years.

In addition to the statistical value of their contribution, the study by Jackson et al is particularly relevant because it gives emphasis to a significant problem in the medical field: hypertension in childhood. In the past few decades, the definition of normative values for blood pressure in the paediatric age range has been increasingly recognised as an important issue in clinical practice and public health because of the changing patterns in the epidemiology and associated determinants of hypertension among children and young adults. Several reasons justify the increasing attention to