Pneumonia in HIV-infected children

Edited by S M Graham

There were until recently few data of the causes of pneumonia in HIV-infected African children except those from autopsy studies. Over the last year, there have been a number of publications from two studies in South African children, one in Johannesburg (Madhi et al) and the other in Cape Town (Zar et al) which provide data relevant to practice in Malawi.

Pneumonia carini pneumonia in South African children with Human Immunodefiency virus. Zar HJ, *et al. Pediatric Infectious Diseases Journal 2000; 19: 603-7.*

PCP was found to be the cause of severe pneumonia in 10% (15 of 151) of HIV-infected children between 2 and 24 months of age. PCP was confirmed in samples obtained by induced sputum or by bronchoalveolar lavage. PCP occurred in young infants (2 to 4 months of age) and compared patients with other causes of severe pneumonia, infants with PCP were sicker, more commonly cyanosed and more likely to die (47% case-fatality rate), despite availability of intravenous cotrimoxazole, prednisone and assisted ventilation in intensive care. These findings are similar to our experience with PCP in Malawian infants. Importantly in the South Africa study, PCP was much less common (1.7%) as a cause of pneumonia in infants receiving cotrimoxazole prophylaxis than in those not receiving prophylaxis (15.2%). These data are consistent with autopsy data from Africa that PCP is a common cause of severe pneumonia in HIV-infected infants, is unusual after 6 months of age, and is responsible for nearly half of the deaths in HIV-infected infants. Cotrimoxazole prophylaxis to prevent PCP is recommended for infants of HIV-infected mothers from 6 weeks until at least 6 months of age.

Inreased disease burden and antibiotic resistance of bacteria causing community acquired lower respiratory tract infections in human immunodeficiency virus type 1-infected children. Madhi SA, et al. *Clinical Infectious Diseases 2000; 31: 170-6.*

Over a one year period at the Chris Hani-Baragwanath hospital in Soweto, 1215 children aged 2-60 months were admitted and investigated for severe pneumonia (WHO criteria), of whom 45% were HIV-infected. The commonest isolates from blood culture were *Streptococcus pneumoniae* (58), *Haemophilus influenzae* (30), *Staphylococcus aureus* (14) and *Escherichia coli* (8). *Mycobacterium tuberculosis* was isolated from gastric washings in 69 cases. Incidence rates for all these organisms were estimated to be far higher (20 to 100 fold) in HIV-infected children. Case-fatality rate was higher in HIV-infected children (13%) compared to HIV-uninfected children (2%). Bacterial isolates from HIV-infected children were more likely to be antibiotic resistant.

Aetiology and outcome of pneumonia in human immunodefiency virus -infected children hospitalised in South Africa. Zar HJ, *et al. Acta Paediatrica 2001; 90: 119-25.*

Aetiology of pneumonia was determined in 250 children requiring intensive care support for severe pneumonia at the Red Cross Memorial Hospital in Cape Town. Investigations included blood culture, induced sputum, nasopharyngeal aspiration and gastric lavage. Of the total, 150 (60%) were HIV-infected (same group as above). The rate (14%) and type of bacteraemia were similar in HIV-infected and - uninfected children with *S.Pneumoniae* and *S.aureus* the commonest. *M.tuberculosis* was isolated from 8% and the rate was also similar between HIV-infected and HIV-uninfected children. Viruses were cultured in 15%, the commonest being cytomegalovirus. The range of bacterial isolates identified in sputum (*S.aureus* and *Klebsiella pneumoniae* were the commonest) differed considerably from the pattern of blood isolates suggesting that sputum may not be very reliable for determining aetiology of bacterial pneumonia. Again, case-fatality rate was higher (20% versus 8%) for HIV-infected than HIV-uninfected children.

Impact of human immunodefiency virus type 1 on the disease spectrum of streptococcus pneumoniae in South African children.. Madhi SA, et al. *Pediatric Infectious Diseases Journal 2000; 19: 1141-7.*

The seroprevalence of HIV was 65% in 225 children with a pneumococcal isolate over a 2 year period. It was estimated that the overall burden of invasive pneumococcal disease was 42-fold higher in HIV-infected children. Clinical presentation was similar except septic shock was significantly more common in HIV-uninfected children. Multiple drug resistance was more common in isolates from HIV-infected children (24% versus 6%). The case-fatality rate did not differ overall between the two groups but mortality was higher in those with advanced AIDS.

Comment: The above data suggest that pneumococcal disease is very frequent in HIV-infected children, the majority of whom are treatment responsive. Autopsy data have emphasised the importance of PCP but only tell a part of the story as they present the skewed picture of diseases that tend to be less treatment responsive and occur in the most immunosuppressed children. As has been found in the USA, invasive bacterial disease is probably much more common in HIV-infected African children than PCP. The organism that was not common in the above studies but may to be much more common in tropical regions of Africa such as Malawi is non-typhoidal *Salmonella.*

Sutum induction for the diagnosis of pulmonary tuberculosis in infants and young children in an uban

setting in South Africa.. Zar HJ, et al. *Arch Dis Child 2000; 82: 305-8.*

The same group of 150 children as outlined in the aboveabstracts underwent sputum induction using nebulised hypertonic saline. *M.tuberculosis* was cultured from 15 of 142 successful specimens (only 3 were positive on microscopy) and the yield was twice as high as for gastric aspiration. The children were between 7 months and 25 months of age, an age in which confirmation tests of pulmonary TB is very unusual. Induced sputum has been used successfully to confirm TB in Malawian children as young as 3 years and in Malawian adults who were smear-negative on usual sputum collection. As it is not expensive or difficult, it does show promise as a diagnostic technique especially in children for whom the need for improved diagnosis is so great. However, the low yield by microscopy is disappointing as a quick result is critical for management.

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