Pneumococcal infection in the newborn

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Abstract

Two fatal cases of invasive pneumococcal disease in the newborn are reported, both acquired from the maternal vagina. The rarity of vaginal carriage of pneumococcus suggests that this organism has a higher invasion to colonisation ratio than group B streptococcus and maternal carriage or neonatal colonisation should be more aggressively treated.

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Streptococcus pneumoniae (pneumococcus) has been estimated to be responsible for 2% of all neonatal sepsis.¹ Invasive neonatal pneumococcal disease is often compared to group B streptococcus in its clinical features and severity.^{2,3} We describe two recent cases of pneumococcal sepsis in the newborn and suggest that greater significance should be attached to the discovery of neonatal colonisation with pneumococcus.

Case reports

CASE 1

A 27 year old mother gave birth vaginally to a 2560 g girl 25 hours after membrane rupture. No resuscitation was required. At 13 hours the baby was noted to be pale, cyanosed and tachypnoeic, and required vigorous resuscitation and transfer to the subregional neonatal intensive care unit. The white cell count was $1.75 \times 10^9/l$ (22% neutrophils), and a chest x ray film showed widespread coarse consolidation. Despite treatment from the onset of symptoms with penicillin and gentamicin she developed intractable pulmonary hypertension requiring inotropic support, tolazoline and prostacycline, and died at 48 hours of age. Culture of surface swabs sent after delivery, blood at 13 hours, and maternal high vaginal swab all grew pneumococcus.

CASE 2

A 31 year old multiparous woman delivered a 3290 g boy 24 hours after membrane rupture. No resuscitation was required. A high vaginal swab had been taken from the mother before delivery, and surface swabs were sent from the baby. No treatment was given, and after 24 hours uneventful observation the baby and mother were discharged from hospital. The next day pneumococcus was isolated from all swabs. The family doctor was informed, but no treatment was started in view of the baby's wellbeing.

Three days later the baby was admitted to

hospital with a two day history of poor feeding. On admission he was irritable and febrile, and blood and cerebrospinal fluid both grew pneumococcus. Treatment with penicillin and cefotaxime was initiated rapidly after admission, but the baby developed renal failure and intractable seizures and died at the age of 3 weeks.

REVIEW OF MICROBIOLOGICAL RESULTS

All high vaginal, cervical, urethral, and genital swabs processed in the microbiology laboratory serving south Sheffield between 1987 and 1991 were reviewed. During this five year period over 15 000 swabs from the above sites were processed and only five were positive for pneumococcus.

Discussion

In 1990 Geelen *et al* reviewed the literature for the clinical features of neonatal pneumococcal sepsis and summarised 43 cases.⁴ Half the cases occurred in preterm babies, and 43% had rupture of membranes more than 24 hours before delivery. Presentation was within 48 hours of birth in 90% of the cases, and the mortality was 50-60%. Geelen *et al* and other authors have commented on the resemblance of this clinical picture to group B streptococcal sepsis.¹⁻³ Between 8-23% of pregnant women carry group B streptococcus in the genital tract. Although colonisation of the baby is usual, the incidence of invasive disease is much lower, with a colonisation to infection ratio of about 100:1.⁵ In light of these data it is not unreasonable to withhold treatment where a baby is found to be colonised with group B streptococcus but is asymptomatic.

Neonatal pneumococcal sepsis is usually of early onset and prior bacteriology results may not be available. On occasion, however, a maternal swab taken before delivery may reveal pneumococcal colonisation in an asymptomatic baby, as in case 2. Should such a baby receive antibiotic treatment? The rarity of vaginal carriage of this organism,⁶ coupled with the fact that pneumococcal sepsis is responsible for 2-5% of all neonatal sepsis^{1,4} suggests a higher invasion to colonisation ratio than for group B streptococcus. We recognise that it is not possible to set 'gold standard' policies based on the limited data available. However, in view of the serious nature of the invasive disease, we would recommend presumptive treatment of babies colonised with pneumococcus, or born to colonised mothers, even if asymptomatic.

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