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IMAGES IN NEONATAL MEDICINE.....

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Massive bacterial cell invasion and reactive type II pneumocytes in bronchoalveolar lavage fluid from a preterm neonate

Bronchoalveolar lavage fluid was collected from a ventilated preterm neonate (gestational age 28 weeks; birth weight 490 g) on day 5, 7 and 11 as part of a study protocol. She

Figure 1 Day 5 bronchoalveolar lavage cytocentrifuge preparation (May–Grünwald–Giemsa staining; magnification 400×). There is extensive bacterial cell invasion of both neutrophils and macrophages.

Figure 2 Day 5 bronchoalveolar lavage cytocentrifuge preparation (May–Grünwald–Giemsa staining; magnification 400×). Reactive type II pneumocytes are seen, typically clusters of large vacuolated cells with a low nuclear to cytoplasmic ratio and peripheral nuclei.

was unexpectedly diagnosed as having pneumonia, despite treatment with amoxicillin and gentamicin. The first cyto-centrifuge preparation revealed an extremely high number of bacteria and extensive cellular invasion (fig 1). The total cell count was 4.2×10^6 cells/ml, 70.3% of which contained intracellular bacteria (67.7% neutrophils; 2.6% macrophages). Coagulase-negative staphylococci (CONS) were cultured from the fluid, and blood cultures taken before starting the antibiotic treatment remained negative. Treatment was switched to vancomycin. Following this both total cell count and the percentage of cells containing intracellular bacteria decreased over time (day 7: 1.6×10^6 cells/ml, 60.8% of cells containing bacteria; day 11: 0.7×10^6 cells/ml, 15.4% of cells containing bacteria). Numerous ghost cells were seen at day 7 (not shown). At both day 5 and 11 reactive type II pneumocytes were noted (fig 2). Despite adequate treatment the baby girl remained dependent on the ventilator, developed severe bronchopulmonary dysplasia, and died at age 4 months. To our knowledge this is the first report of intracellular bacteria and reactive pneumocytes in bronchoalveolar lavage fluid from a preterm.

CONS are the most common cause of septicaemia in preterms. Our patient most probably did not have prior septicaemia, as blood cultures remained negative, and the pneumonia was possibly ventilator associated. CONS pneumonia is rare in preterms, therefore an underlying immune deficiency may have been present. Prior to the infection the baby had marked leucopenia, which may have increased her susceptibility to the infection. Yet while in hospital she had several episodes of infection, and she may have been susceptible to infection as a result of prematurity and extreme intrauterine growth retardation. However, an underlying immune deficiency cannot be ruled out.

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The Medical Ethics Committee of the Maastricht University Hospital, Maastricht, the Netherlands, approved the study in which the patient was enrolled and bronchoalveolar lavage fluid was collected.