Annotation

Pathogen or commensal?

The distinction between bacterial commensals and pathogens has never been sharp in the perinatal period. At other ages commensals are mainly to be found on the skin and in the upper respiratory, gastrointestinal, and lower genitourinary tracts. They and other so-called nonpathogens of the environment may assert on occasions a dangerous and sometimes lethal dominance in the fetus and newborn, which is foreign to their role of peaceful coexistence with healthy older children and adults. If however there is impaired host defence, the body commensals may move away from their usual place of residence to invade other tissues; and it seems likely that it is a similar failure to mount the necessary immune and inflammatory responses to fight infection which accounts for the newborn's peculiar susceptibility to an enormously wide variety of bacteria.¹ A greater awareness of the opportunism of the 'harmless' variety perhaps came as incubators and other apparatus containing humidification units were introduced into newborn nurseries on a large scale, for a plethora of weird microbes flourished in the water there.² Generic names such as *Pseudomonas*, *Acinetobacter*, *Moraxella*, *Alkaligenes* and *Edwardsiella* among others soon found their way into paediatricians' vocabulary; and paediatricians began to realise that the deficiencies of their sterilisation procedures could cause fatal sepsis in their immunologically innocent patients.

Bacterial commensals of the vagina may also pose special problems for the infant, and group B streptococcal infection is a case in point. In a recent issue of this journal the isolation of *Corynebacterium kutscheri* in pure culture from the umbilical cord, fetal membranes, rectum, nose, throat, eye, and external ear of an immature infant was described.³ It was also possible to demonstrate numbers of organisms within the cord and membranes, and the cellular response they evoked. The 980-g infant was ill for several days after birth, and radio-opacities in the chest were thought to be consistent with a pneumonitis. As she recovered, and the organism was not isolated from her tracheal aspirate, proof that *C. kutscheri* caused the illness was lacking, although the circumstances certainly suggested it. Diphtheroids are recognised as part of normal vaginal flora, but rarely if ever are they

reported in pure culture, as Fitter *et al.*³ pointed out.

Chorioamnionitis and funisitis, such as they described, were the subjects of careful work some years ago,⁴⁻⁵ and have recently been re-examined in a series of publications by Naeye *et al.*⁶⁻¹³ They believe amniotic fluid infection syndrome to be the leading cause of perinatal mortality; and define it as congenital pneumonia associated with inflammation of the extraplacental membranes, umbilical cord and chorionic plate of the placenta, with intact membranes at the beginning of labour. They state that the condition in most cases, is caused by bacteria ascending from the vagina and that invasion of membranes near the cervical os leading to a localised chorioamnionitis is a fairly common event. *Mycoplasma* sp. may be responsible in a small proportion of cases.⁹ The condition has its peak between 20 and 26 weeks of gestation—when it may be associated with premature rupture of the membranes and premature labour, and repeated fetal losses—drops to its lowest between 32 and 37 weeks, and then increases again.¹² Studies in New York City showed it to have a direct association with poverty,⁶ and to be more common in blacks than in Puerto Ricans and whites. Parallel studies in Ethiopia have shown the same relation with poverty. They have also shown an interesting inverse connection between water usage and the amniotic infection syndrome, with a low incidence of the condition when the use of water is high, even in the poorest sections of the community, though as the use to which the water had been put was unknown, no conclusions could be drawn.¹⁰ Amniotic fluid is now known to have antimicrobial properties. A low molecular weight fraction consisting of a family of polypeptides whose bactericidal activity is zinc-dependent has been isolated.¹⁴⁻¹⁵ Antimicrobial activity was found to be absent at term in 75% of 53 Ethiopian women studied, and undernutrition was suggested as the most likely cause.¹¹

There are some fundamental difficulties in regarding many cases of congenital pneumonia as a true infection as Naeye *et al.* do, for often the histological picture seems to represent a passive aspiration of maternal leucocytes into the air spaces, together with squames and amniotic debris.¹⁶⁻¹⁷ There is rarely evidence of infiltration or destruction

of bronchopulmonary tissue, although this may occur in the fetal membranes with the accompanying chorioamnionitis. Leucocytes found in the gastric aspirate shortly after birth following prolonged membrane rupture have certainly been proved maternal in origin.¹⁸ Furthermore the histological findings in the lungs in the often devastating intra-partum infection caused by group B β -haemolytic streptococcus may be very different.¹⁹ Many babies with congenital pneumonia, especially in the Ethiopian series, were stillborn. There was a pronounced fall in deaths from pneumonia in this country between the two National Perinatal Mortality Surveys of 1958 and 1970. Thus perinatal deaths from pneumonia fell from 1.3/1000 to 0.1/1000 total births, and first week deaths from 1.0/1000 to 0.1/1000 livebirths.²⁰ Although it is not certain to what extent 'congenital pneumonia' as defined by Naeye⁸ took part in this decrease, one might suppose that many infants with amniotic fluid infection syndrome have died an asphyxial death in the past, and that improved antenatal care with careful watchfulness during labour, and improved resuscitation at birth will allow many of them to live. Chorioamnionitis is certainly a fairly common condition, and may exert its greatest harm by its association with premature labour. But there is also evidence not confined to necropsy material,²¹⁻²² to show that infants may come from an infected intrauterine environment unscathed; few would deny however that their liability to subsequent sepsis is greater.

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