Antibiotics for Preterm Premature Rupture of Membranes

Background Information

Despite socioeconomic improvements and the development of a large range of therapeutic interventions, little progress has been made in reducing the incidence of preterm birth in recent decades. In industrialised countries the proportion of births before 37 weeks remains six to eight per cent. About one third of these is associated with preterm prelabor rupture of membranes (pPROM) (Mercer 1995). This is thus an important problem, which places both mother and child at risk of infection, preterm delivery and the complications of prematurity.

The causes of pPROM are multifactorial. Infection appears to have an important role, either as a cause or as a consequence of pPROM. Some organisms may produce collagenases, mucinases and proteases which weaken the amnion and chorion and may lead to pPROM. On the other hand, infection may occur secondary to membrane rupture. Ascending infection may lead to occult deciduitis, frank intra-amniotic infection or fetal infection.

A possible mechanism for the link between infection and preterm delivery is bacterial stimulation of the biosynthesis of prostaglandins, either directly via phospholipase A2 and C (Bejar et al 1981), or indirectly via substances such as interieukin-1, tumour necrosis factor and platelet activating factor. All of the above may be found in infected amniotic fluid (Lamont et al 1987). Attention has been directed at the management of women once pPROM has occurred, as risk assessment strategies have not been useful in it's prediction.

In theory, antibiotic therapy might improve outcome by two processes. Prevention or treatment of infection may, firstly, reduce maternal or fetal infectious morbidity. Secondly, ft may delay the progression to preterm birth described above. This may reduce the neonatal consequences of prematurity.

In general, prolongation of pregnancy would be expected to improve subsequent child development by reducing the effects of prematurity However, it is plausible that maternal antibiotic therapy may suppress the stimulation of labour without effectively treating fetal infection. Such prolongation of intrauterine infection may have adverse consequences for the health of the baby. Uncertainty concerning the benefits of prolonging pregnancy in the presence of pPROM is heightened by the findings of two observational studies (Murphy et al 1995, Spinillo et all 995). Both showed a positive correlation between duration of rupture of membranes and risk of cerebral palsy or other neurodevelopmental impairment.

There may, in theory, be differences in the effects of different antibiotics. For example, macrolide antibiotics such as clindamycin and erythromycin which reduce bacterial virulence may have advantages over the beta lactam antibiotics (penicillins, cephalosporins) which, by destroying bacteria, release endotoxins and prostaglandins and may worsen outcomes (McGregor 1997).

Literature review for evidence regarding the use of antibiotics in the management of patients with preter PROM.

Objectives: The aim of the review was to evaluate the effectiveness and the immediate and long-term safety of the effects of administering antibiotics to women with preterm prelabor rupture of membranes on maternal infectious morbidity, fetal and neonatal morbidity and mortality, and longer term childhood development.

Search strategy: All randomized trials identified using the search strategy described by the Cochrane Pregnancy and Childbirth Group.

Selection criteria: All trials which reported clinically relevant outcomes (as opposed to laboratory data) were included.

Data collection and analysis: Data were extracted from each report without any blinding of either the results or the treatments which women received. Unpublished data were sought from a number of authors.

Main results: Antibiotic treatment following pPROM is effective at prolonging pregnancy and reducing maternal and neonatal infectious morbidity. **There is no statistically proven benefit** that their use improves neonatal mortality and morbidity in the short or long term.

Conclusions: There are insufficient data to recommend routine prescription of antibiotics in this clinical situation. Research into this area should continue.

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