

## PROBIOTICS

### Use

Probiotics can be used to restore a healthy balance of bowel micro-organisms in children troubled by diarrhoea. Ten controlled trials have also shown that use reduces the risk of necrotising enterocolitis (NEC), presumably by encouraging the bowel of the preterm baby to become colonised by a less pathogenic bacteria.

### Microbiological issues

Interest in the use of lactic-acid-producing bacteria to retain or restore a healthy balance of micro-organisms in the gut has grown steadily in the last 20 years, and commercially available live cultures of these organisms are now often called 'probiotics'. *Lactobacillus bulgaricus*, which occurs in naturally soured milk, was the first organism to be widely studied, but this does not grow well in the human gut, and various other lactobacilli including *L acidophilus*, a normal inhabitant of the gut, and *L casei* are now more commonly used. Other organisms studied include *Saccaromyces boulardi*, *Streptococcus thermophilus* and various *Bifidobacterium* species. Early studies focused on the ability of these microbial supplements to re-establish a more normal bowel flora in children suffering from serious diarrhoea, and other studies looked to see if use could enhance growth in early infancy. Studies in the last ten years have now, more importantly, looked to see whether early prophylactic use can minimise the risk of excessive and unbalanced early colonisation of the gut by other potentially pathogenic organisms in the vulnerable preterm baby. The few trials done as yet to see whether use can reduce disease severity in babies with severe atopic dermatitis have had inconsistent outcomes.

Sustained close contact with the mother helps the normal baby acquire a balance of healthy gut bacteria at birth, as can breast feeding. The gut of the unfed, antibiotic treated, preterm baby is, in contrast, at high risk of being colonised by potential pathogens, and this may be one of the prime factors that renders the baby vulnerable to NEC – a condition in which the gut wall can perforate, causing toxic peritonitis and septicaemia, after it is invaded and killed by pathogenic gas-forming organisms. Reduced gut blood flow in the period immediately before and after birth (which is particularly common in the light-for-dates baby), puts the baby at even greater risk. Serious NEC currently occurs in about 7% of babies born more than 12 weeks early, and is one of the commonest causes of death in those who manage to surmount the respiratory problems seen in the first week of life. Even in survivors the need for surgery, and for further respiratory support, can have a serious impact on subsequent growth and development, especially if surgery involved the removal of a significant length of gut. The use of breast milk seems to reduce the risk of NEC. So, too, can prophylaxis with an oral antibiotic (as outlined in the monograph on gentamicin), but this strategy is seldom used at present because of continuing concern that such treatment could encourage the proliferation of multiply-resistant organisms. Hope is rising that probiotic priming, and the more consistent use of breast milk, could greatly reduce the current scourge of NEC. Whether selective oral antibiotic prophylaxis could further enhance these two strategies is not yet known.

### Prophylactic neonatal use

It is increasingly clear that treatment is beneficial in babies of less than 30 weeks gestation, but the best product to use is not yet clear. A 125 mg/kg dose of Infloran<sup>®</sup> (a mixture of *L acidophilus* and *B bifidum*) was given twice a day in the largest trial reported to date. Start prophylaxis as soon as feeds are started, and give for six weeks. A further trial (PREFER) is due to start recruiting in the south of England in late 2008.

### Supply and administration

Infloran is imported into UK from Austria by IDIS World Medicines. Twenty 250mg capsules (which should be stored at 4°C) cost £14. Mix half the content of one capsule with milk immediately before it is given.

### References

See also the relevant Cochrane reviews ©

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