

Probiotics in children - what is the evidence of efficacy?

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Professor Szajewska began her lecture by describing the use of meta-analysis of randomised controlled trials (RCTs), where the results of different studies are combined to obtain a qualitative estimate of the overall effect of a particular intervention or variable on a defined outcome. Two main reasons to perform a meta-analysis are to increase power and to increase precision of the results. The results of individual studies could be pooled together if the studies are considered sufficiently homogenous in terms of the question and methods. Documented results may be used to define treatment guidelines.^{2,3}

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Acute Gastroenteritis:

Oral rehydration solution is the mainstay of treatment but it does not decrease the frequency of bowel movement, fluid loss or duration of diarrhoea. The use of probiotics reduces the duration of diarrhoea by about a day. The beneficial effects of probiotics are strain specific. Well documented is the efficacy of *Lactobacillus* GG or *Saccharomyces boulardi*.

Prevention of Antibiotic Associated Diarrhoea (AAD):

Antibiotic associated diarrhoea is diarrhoea caused by the administration of broad spectrum antibiotics. In the RCTs used in the meta-analysis 11-40% of the children received broad spectrum antibiotics. The 6 RCTs totalled 766 children.

The organism *Clostridium difficile* is associated with most AAD. In the meta-analyses it was found that probiotics reduced the incidence of AAD by an average of 60%. The number needed to treat (NNT) was about 9. The conclusion was that the use of probiotic strains with proven efficacy is reasonable to prevent AAD whenever the physician feels that preventing this usually self-limited complication is important. In a meta-analysis of the RCTs in the prevention of AAD in adults and children, there was a 60% reduction in AAD. The NNT was 9.

Prevention of Nosocomial Diarrhoea and Respiratory Infections:

In a RCT done in Croatia in a population of 742 hospitalised children, *Lactobacillus* GG was assigned randomly to children, the others were given placebo. There was a significant reduction in the incidence of both diarrhoea and respiratory infection and it was concluded that *Lactobacillus* GG can be recommended to prevent nosocomial infections.

Prevention of necrotising enterocolitis (NEC):

The incidence of NEC in very low birth weight (VLBW) infants, less than 33 weeks gestation, is approx 3% but could be much higher

in some settings. There is a low colonisation with bifidobacteria and lactobacilli in VLBW infants. The results of two meta-analyses documented that probiotics reduced the risk of NEC by 64%. The rationale for the use of probiotics to prevent NEC is the increased barrier to translocation of bacteria across mucosa and the exclusion of pathogens and modification of host response. It is stressed that not all probiotics are equal. The use of probiotics had no effect on blood culture sepsis however.

Probiotics for allergy prevention:

A Cochrane Review found that there was insufficient evidence in finding probiotics to be beneficial in all allergies.

Safety of probiotics:

It has been found that the use of probiotics is safe in the general healthy population. There are populations such as the immunocompromised subjects where their safety has not been established. It should not be used in acute pancreatitis. In a recent article in the Lancet, there was an increase in mortality with probiotic use in acute pancreatitis. It should not be used in the recovery period immediately after surgery or in individuals with decreased gut integrity or having risk of infection from any source. It is well tolerated and safe in healthy population groups. The effectiveness of probiotics depends on the strain. Not all probiotics are equal.

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References

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