The Role of Probiotics in the Prevention of Functional Gastrointestinal Disorders

Flavia Indrio

Department of Pediatrics
University of Bari
Bari, Italy
f.indrio@neonatologia.uniba.it

Key Messages
Probiotic supplementation may represent a new strategy for preventing functional gastrointestinal disorders and their early and long-term health consequences.

Functional gastrointestinal disorders (FGIDs) are defined as a variable combination of chronic or recurrent gastrointestinal symptoms that cannot be explained by structural or biochemical abnormalities. Since FGIDs in childhood are age-dependent, the Rome Foundation established two different paediatric committees to identify the criteria for an FGID diagnosis: the Infant/Toddler Committee (age up to 4 years) and the Child/Adolescent Committee (age 4–18 years) [1, 2].

Infantile colic, gastro-oesophageal reflux and constipation are the most common FGIDs that lead to the referral to a paediatrician during the first 6 months of life and are often responsible for hospitalization, feeding changes, use of drugs, parental anxiety and loss of parental working days with relevant social consequences [3]. In particular, infantile colic is the cause of 10–20% of all visits to a paediatrician in the first 4 months of life; nearly 50% of all healthy infants aged between 0 and 3 months regurgitate at least once a day, with infant regurgitation representing 25% of paediatric consultations and 3% of gastrointestinal paediatric consultations. Constipation is generally responsible for 3% of all visits to a paediatrician [4].

Although FGIDs have been considered as self-limited processes, it has already been shown that a low-grade mucosal inflammation and immune or motor alterations could be found in infants affected by colic, regurgitation and constipation. This early traumatic insult to the intestine may represent a risk factor for the development of irritable bowel syndrome and psychological problems later in life [5].

Recent work has indicated a crucial role for the intestinal microbiota in the pathogenesis of gastrointestinal disorders, e.g. FGID, and there are many studies that target probiotic therapy for specific diseases such as colic, regurgitation and constipation [6–8]. The effect of a probiotic could play a crucial role in the modulation of intestinal inflammation. A recent multicentre randomised clinical trial has investigated the effectiveness of *Lactobacillus reuteri* supplementation in the prevention of FGIDs in newborns (fig. 1) [9].

Driving microbiota colonization since the first weeks of life by giving probiotics may promote intestinal permeability, visceral sensitivity and mast cell density. Probiotic supplementation in a prophylactic way may represent a new strategy for preventing FGIDs and their early and long-term health consequences (fig. 2).

Fig. 1 Primary outcome after 3 months of probiotic supplementation.

<table>
<thead>
<tr>
<th></th>
<th>L. reuteri</th>
<th>Placebo</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colic (min/day)</td>
<td>3.77 ± 3.3</td>
<td>7.09 ± 5.19</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Regurgitation (times/day)</td>
<td>3.4 ± 2.7</td>
<td>4.6 ± 3.2</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Evacuation (times/day)</td>
<td>4.2 ± 1.8</td>
<td>3.6 ± 1.7</td>
<td>&lt;0.01</td>
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Fig. 2 Probiotic supplementation in early life could drive the microbiota colonization to protect the intestine from early traumatic insult and prevent the onset of FGIDs later in life.

References