Probiotics in Pregnancy: Are Probiotics Preventative Against Infantile and Childhood Atopic Dermatitis?

ABSTRACT

Atopic dermatitis (AD) is a chronic, or chronically recurrent, inflammatory skin disease. Peak prevalence occurs during infancy - 20% of infants and young children have AD. Globally, AD affects 3.5% of the population worldwide1. Although it is not known what causes AD, there is speculation that it is related to family history of the disease, maternal nutrition while she is carrying the child, and gut microbes that babies might lack during infancy. Since there is no known cure for the condition, the focus is on prevention. One of the most common prevention options is through the use of probiotics, specifically strains from the Lactobacillus and Bifidobacterium genera. The mechanism of action of probiotics is not known, however, the hypothesis suggests that they have more susceptible to allergic diseases because of a lack of exposure to microbes in early life2.

Figure 5: Summary table of results

Table 1: Atopic Dermatitis in Infancy

<table>
<thead>
<tr>
<th>Study</th>
<th>Type of study</th>
<th>No. of participants or databases utilized</th>
<th>Treatment or Measurement of Risk</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boyle et al (2011)</td>
<td>RCT</td>
<td>250 women-infant pairs</td>
<td>LGG daily from 36 weeks gestation until delivery</td>
<td>Prenatal treatment with Lactobacillus rhamnosus GG was not significant for preventing eczema (OR 0.59)</td>
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<tr>
<td>C.K. Dornvedt et al (2011)</td>
<td>RCT</td>
<td>415 women-infant pairs</td>
<td>Probiotic milk containing LGG and Bb-12 daily from 36 weeks gestation to 3 months postnatal</td>
<td>Odds ratio for the cumulative incidence of AD was 0.51 in the probiotic group and the placebo group, suggesting that LGG in breast milk given to mothers reduced the cumulative incidence of AD.</td>
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<tr>
<td>Hoore et al (2009)</td>
<td>RCT</td>
<td>171 women-infant pairs</td>
<td>LGG and Bb-12 strains supplemented from first trimester until the end of exclusive breastfeeding</td>
<td>LPR = BL993 (OR 17) or ST1Y1 = BL993 (OR 15) were both associated with a statistically significant reduction in the risk of developing eczema and chronically persistent eczema among the first 24 months of life compared with infants whose mothers received placebo.</td>
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<tr>
<td>Rautava et al (2012)</td>
<td>RCT</td>
<td>205 women-infant pairs</td>
<td>Oral probiotic supplementation with Bifidobacterium strains.</td>
<td>Atopic eczema was diagnosed at the age of 12 months in 9.7% of the infants in the probiotic group and 17.6% of the infants in the placebo group (OR 0.51).</td>
</tr>
<tr>
<td>N. Foold et al (2014)</td>
<td>Systematic review</td>
<td>20 RCTs and 1 follow up study</td>
<td>Medline, Cochrane Central, Embase, PubMed, and Cochrane</td>
<td>Lactobacillus rhamnosus GG was the most effective in low risk atopic dermatitis whereas L. helveticus H019 was most effective in high risk of atopic dermatitis.</td>
</tr>
<tr>
<td>M.A. Mansfield et al (2014)</td>
<td>Systematic review and meta-analysis</td>
<td>27 total publications, 6 RCTs, 25 publications</td>
<td>EMBASE, PubMed, and Cochrane</td>
<td>The use of probiotics supplementation beginning in gestation through the first 6 months of life has been shown to decrease incidence of atopic dermatitis to 26%.</td>
</tr>
<tr>
<td>M. Pandur et al (2015)</td>
<td>Systematic review and meta-analysis</td>
<td>16 RCTs</td>
<td>Pubmed, Scopus, Web of Knowledge, ClinicalTrials.gov, Google Scholar and ClinicalTrials.gov</td>
<td>Probiotic administration has protective role in atopic dermatitis prevention especially when administered in the last weeks of pregnancy followed by the supplementation of infants during the first months of life.</td>
</tr>
</tbody>
</table>

METHODS

1. ViVoLink’s “Search,” a structured literature review was conducted first using the following keywords, probiotics, prenatal, and pregnancy, and atopic dermatitis (see Figure 1).
2. A date range of 2006 to 2016 was imposed.
3. Non-peer-reviewed articles were included.
4. Foreign language was excluded.
5. The inclusion criteria terms were: pregnant women, pregnancy, prevention; probiotics, prenatal and postnatal maternal probiotic supplements on the prevention of infantile and childhood atopic dermatitis.
6. The majority of our findings emphasized a need for more research on probiotics in pregnancy.
7. The study populations in the RCTs were varied which impacts infantile AD more than childhood AD.

BACKGROUND

Atopic dermatitis (AD) is a chronic, or chronically recurrent, inflammatory skin disease. Peak prevalence occurs during infancy - 20% of infants and young children have AD. Globally, AD affects 3.5% of the population worldwide1. Although it is not known what causes AD, there is speculation that it is related to family history of the disease, maternal nutrition while she is carrying the child, and gut microbes that babies might lack during infancy. Since there is no known cure for the condition, the focus is on prevention. One of the most common prevention options is through the use of probiotics, specifically strains from the Lactobacillus and Bifidobacterium genera. The mechanism of action of probiotics is not known, however, the hypothesis suggests that they have more susceptible to allergic diseases because of a lack of exposure to microbes in early life.

Rationale: Incidences of allergic diseases are rising across the world, and with no treatment available, research into prevention is key.

Research Question: Do probiotic supplements in pregnancy and breastfeeding prevent the development of infantile and childhood atopic dermatitis?

CONCLUSION

The majority of findings in this literature indicate that prenatal and postnatal probiotic supplements in pregnancy and breastfeeding have a positive protective effect on infants and childhood atopic dermatitis respectively. Probiotics use heterogeneity can still be found in the results. More research on the different effects of probiotics has also been proposed.

REFERENCES


DISCUSSION

The majority of findings in the literature indicate that prenatal and postnatal probiotic supplements in pregnancy and breastfeeding have a positive protective effect on infants and childhood atopic dermatitis respectively. Probiotics use heterogeneity can still be found in the results. More research on the different effects of probiotics has also been proposed.

ACKNOWLEDGEMENT

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