



Background into Probiotic Studies Undertaken by the Wellington Asthma Research Group and Collaborative Research Partners

The “hygiene hypothesis” is the most widely accepted hypothesis for the increase in allergic disease over recent decades. This states that reduced exposure to bacteria over time has resulted in a deviation of the developing immune system towards allergic disease. Probiotics are “good” bacteria that are found in our intestinal microflora as well as in fermented products such as yoghurt. They benefit us by providing a healthy bacterial balance in our gut, providing a barrier against the absorption of allergens, and contributing towards a healthy and balanced immune system.

Our primary research interest is the role they play in protection against the development of allergic disease, in particular eczema and allergic sensitization* and the treatment of established eczema. We are now extending our interest to determine if probiotics also have a role to play in improving women’s health during pregnancy.

(*Allergic sensitization is where the body launches an unhelpful immune response when exposed to specific allergens (such as foods or pollens). Often such a response is manifest as allergic disease.)

Past studies of treatment

In one of our studies we looked at the combined effects of 2 probiotics on eczema among children with established eczema and found an improvement in eczema symptoms among children taking the probiotic combination, but only among children who were sensitized to food¹.

Past studies of prevention

Our first major prevention study has investigated the role of particular probiotics taken during pregnancy and breastfeeding in mothers and during early life in infants². This randomized placebo-controlled trial targeted 474 families with children at risk of allergic disease and investigated the effects of 2 separate probiotics. The aim was to determine if daily dietary supplementation with either probiotic was effective in preventing the development of eczema and allergic sensitization. Pregnant women were recruited at 35 weeks gestation and their infants at birth and followed for 2 years with 3 monthly assessments for eczema and an assessment of allergic sensitization, measured by skin prick tests, at age 2 years. During this time women took a study capsule daily until 6 months if breastfeeding and infants took the capsule daily for 2 years. Since then we have also

assessed these children at age 4 and 6 years and so far published our results for the effects on eczema and allergic sensitization at ages 2 and 4 years³.

At both these time points, we have shown an effect of one of the probiotics we trialed in preventing the development of eczema, whereas the other did not reduce the prevalence of eczema. Any effects on allergic sensitization were weak.

Probiotics in Pregnancy: Improving health during pregnancy & preventing infant eczema and allergy

Preliminary research suggests that an earlier pregnancy intervention may be necessary to protect against the development of allergic sensitization but further research is needed to confirm this. As allergic sensitization precedes many allergic diseases, preventing a child from becoming sensitized early in its development in the mother's womb, may have longer term effects on the development of other allergic diseases, such as eczema, food allergy, hay fever, and asthma.

We are planning to investigate this hypothesis in a randomized placebo-controlled trial. Women will be asked to take a study capsule daily from 14-16 weeks gestation until 6 months post birth while breastfeeding. The child will not take the probiotic at all. When the child is aged 6 months and 1 year old, we will examine their skin for eczema and assess them for any allergies. As a secondary hypothesis, we will also be assessing the effects of this probiotic on the presence of gestational diabetes (diabetes that occurs only in pregnancy) and bacterial vaginal infections in women during pregnancy.

While many studies have investigated the effects of probiotics on allergic disease, this is one of the first studies in extending the outcomes to health during pregnancy. A particular strength of this study is that the simple single intervention being tested (probiotics ingested by the woman) may offer an opportunity to positively impact multiple health outcomes in both the infants and pregnant women themselves.

References:

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2. Wickens K, Black PN, Stanley TV, Mitchell E, Fitzharris P, Tannock GW, et al. A differential effect of 2 probiotics in the prevention of eczema and atopy: A double-blind, randomized, placebo-controlled trial. J Allergy Clin Immunology. 2008;122:788-94.
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(Authors names underlined above are investigators in the Probiotics in Pregnancy Study)