

Fish oil and probiotic supplements in pregnancy may reduce risk of childhood allergies

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In one of the largest ever research reports of how a pregnant woman's diet affects her baby's allergy and eczema risk, scientists from Imperial College London assessed over 400 studies involving 1.5 million people.

As part of the study, they found that when pregnant women took a daily fish oil capsule from 20 weeks pregnant, and during the first three to four months of breastfeeding, risk of [egg allergy](#) in the child was reduced by 30 per cent.

The team, who were commissioned by the Food Standards Agency, also found that taking a daily probiotic supplement from 36-38 weeks pregnant, and during the first three to six months of breastfeeding, reduced the risk of a child developing [eczema](#) by 22 per cent.

The researchers, who published their meta-analysis in the journal *PLOS Medicine*, found no evidence that avoiding potentially allergenic foods such as nuts, dairy and eggs during pregnancy made a difference to a child's allergy or eczema risk.

Dr Robert Boyle, lead author of the research from the Department of Medicine at Imperial College London, explained: "Food allergies and eczema in children are a growing problem across the world. Although there has been a suggestion that what a woman eats during pregnancy may affect her baby's risk of developing allergies or eczema, until now there has never been such a comprehensive analysis of the data."

He added: "Our research suggests probiotic and [fish oil supplements](#) may reduce a child's risk of developing an allergic condition, and these findings need to be considered when guidelines for [pregnant women](#) are updated."

The team also assessed a host of dietary factors during pregnancy including fruit, vegetable and vitamin intake, but found no clear

evidence that any of these affected allergy or eczema risk.

Allergies to foods, such as nuts, egg, milk or wheat, affect around one in 20 children in the UK. They are caused by the immune system malfunctioning and over-reacting to these harmless foods. This triggers symptoms such as rashes, swelling, vomiting and wheezing.

Eczema affects around one in five children in the UK, and causes dry, cracked and itchy skin. The causes of eczema and allergies are not fully understood, but allergies are more common in people who suffer from eczema.

More research is now needed to understand how probiotics and fish oils may reduce allergy and eczema risk, said Dr Vanessa Garcia-Larsen, co-author of the study from the National Heart and Lung Institute at Imperial: "Despite allergies and eczema being on the rise, and affecting millions of children, we are still hunting for the root causes of these conditions, and how to prevent them."

Dr Garcia-Larsen, who is also based at John Hopkins University, added: "This study has provided clues, which we now need to follow with further research."

In the current study, the team assessed 28 trials of probiotic supplements during pregnancy, involving around 6,000 women. Probiotics contain live bacteria that may influence the natural balance of bugs in the gut. Previous research has linked a disruption in naturally-occurring bacteria to allergy risk.

In the research, probiotics were taken during pregnancy and breastfeeding as a capsule, powder or drink (most yogurts do not contain enough probiotic). They were found to reduce the risk of a child developing eczema - between the ages of six months to three years - by

22 per cent. This is the equivalent of 44 cases of eczema per 1000 children.

The scientists added that the probiotics, which mostly contained a bacterium called *Lactobacillus rhamnosus*, were not used in early pregnancy.

The team also assessed around 19 trials of fish oil supplements during pregnancy, involving around 15,000 people. These studies revealed a 30 per cent reduction in risk of egg allergy by age one, which equates to a reduction of 31 cases of egg allergy per 1000 children.

Egg allergy was tested with a skin test, where a tiny amount of egg is pricked onto the skin.

In the studies using fish oil supplements, the capsules contained a standard dose of omega-3 fatty acids (another type of fatty acid, called omega-6, was not found to have any effect on allergy risk).

Dr Boyle added that previous research suggests fish oils may help dampen down the immune system, and prevent it from over-reacting.

Most of the trials used supplements, although one involved eating oily fish, and a few others used non-fish oils such as nut oils. The Department of Health advises women to eat no more than two portions of oily fish a week, and to avoid shark, swordfish or marlin as these contain high levels of mercury.

The team also found that taking fish oil supplements during pregnancy reduced the child's risk of peanut allergy by 38 per cent. However they caution this finding was based only on two studies, and not as reliable as the egg allergy and eczema results.

The study also revealed some evidence for links between longer duration of breast feeding and a reduced risk of eczema, and breastfeeding was also linked with a lower risk of type one diabetes.

The findings of this study, funded by the Food Standards Agency, are being considered by the Government alongside the wider evidence base on infant feeding and the introduction of solids. As part of the cross-government review of complementary feeding, the risks and benefits associated with the timing of introduction of allergenic foods will also be considered.

The Food Standards Agency advises that families should continue to follow the current Government advice to exclusively breastfeed for around the first six months of age, and continue breastfeeding thereafter. Solid foods should be introduced into the infant diet at around six months of age. Pregnant women should also continue to follow government dietary and supplement advice.

More information: Garcia-Larsen V, Ierodiakonou D, Jarrold K, Cunha S, Chivinge J, Robinson Z, et al. (2018) Diet during pregnancy and infancy and risk of allergic or autoimmune disease: A systematic review and meta-analysis. *PLoS Med* 15(2): e1002507. doi.org/10.1371/journal.pmed.1002507

Provided by Imperial College London

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