Blackcurrant Seed Oil for Prevention of Atopic Dermatitis

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Pia Linnamaa, MD, defended her PhD thesis "Blackcurrant Seed Oil for Prevention of Atopic Dermatitis" in Turku on April 11th, 2014. The Opponent was Professor Sakari Reitamo from the Department of Dermatology, Allergology and Venereology, University of Helsinki. The thesis is available from https://www.doria.fi/bitstream/handle/10024/95770/AnnalesD1109Linnamaa.pdf.

One hypothesis for the increased incidence of atopic diseases is that it is associated with changing dietary habits, especially the changed intake of essential fatty acids (EFAs). The metabolism of EFAs produces eiconasoids, prostaglandins and leukotrienes, which are essential to organs and play a major role in regulation of inflammation and immune response. In some studies persons with atopic dermatitis have been found to have reduced levels of EFAs. The first year of infancy as well as the foetal period are crucial for the development of atopic immune response. The composition of blackcurrant seed oil corresponds to the recommended ratio of EFAs n-3 and n-6 in the diet (1/3–1/4) and as a dietary supplement could, even in small doses, modify the unbalance of EFAs in an efficient way.

The purpose of this dissertation was to find out whether atopic allergies could be prevented by supplementing the diet of pregnant mothers with blackcurrant seed oil and whether it could affect the immunological balance of a child. We also aimed to find out whether a blackcurrant seed oil supplementation can affect the composition of breast milk to suppress the T-helper 2 lymphocyte (Th2) responses in infants.

Three hundred and thirteen pregnant mothers were randomly assigned to receive blackcurrant seed oil (*n*=151) or olive oil as placebo (*n*=162). Supplementation was started at the 8th to 16th weeks of pregnancy, 6 capsules per day (dose of 3 g), and continued until the cessation of breastfeeding. It was thereafter followed by direct supplementation to infants of 1 ml (1 g) of oil per day until the age of two years. Atopic dermatitis and its severity (SCORAD index) were evaluated, serum total IgE was measured and skin prick tests were performed at the age of 3, 12 and 24 months. Peripheral blood mononuclear cell (PBMC) samples were taken at the age of 3 and 12 months and breast milk samples were collected during the first 3 months of breastfeeding. Parental atopy was common (81.7%) in the studied infants, making them infants with increased atopy risk.

Fig. 1. Pia Linnamaa (right) defended her PhD thesis in Turku on April 11th, 2014. The thesis was supervised by Professor Johannes Savolainen (middle), and Docent Leena Koulu. The Opponent was Professor Sakari Reitamo (left).

The results showed a significantly lower prevalence of atopic dermatitis in the blackcurrant seed oil group (33%) than in the olive oil group (47%) at the age of 12 months. Also, SCORAD was lower in the blackcurrant seed oil group than in the olive oil group. Dietary intervention with blackcurrant seed oil had immunomodulatory effects on breast milk, inducing cytokine production from Th2 to Th1 immunodeviation. It decreased the level of IL-4 and elevated the level of interferon-gamma. blackcurrant seed oil intervention did not affect cytokines in the children's PBMC. However, children of smoking parents in the combined blackcurrant seed oil and olive oil group had significantly elevated levels of Th2 type cytokines IL-4, IL-5 and the proinflammatory cytokine tumour necrosis factor. Dietary supplementation with blackcurrant seed oil is safe. It is well tolerated and transiently reduces the prevalence of atopic dermatitis at the age of 12 months. It can possibly become a potential tool in prevention of atopic symptoms when used at the early stages of life.