

## **Decreased $\Delta 6$ -Desaturase (*FADS2*) Gene Expression in Peripheral Blood of Atopic Eczema Children**

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Atopic eczema (AE) is a multi-factorial skin disease caused by a variety of factors such as genetic conditions, altered skin structure, immunologic deviations, psychological and environmental factors, among others. Impaired metabolism of essential fatty acid and LC-PUFAs has been reported in atopic eczema development. Higher levels of linoleic acid (LA, C18:2 n-6) and lower levels of GLA (C18:3 n-6), DGLA (C20:3 n-6) and AA (C20:4 n-6) have been found in the plasma of atopic children and adults, compared with healthy control subjects. According to findings of several studies a deficiency in enzyme activity of  $\Delta 6$ -desaturase (D6D), encoded by the *FADS2* gene, could be related to lower concentrations of LA and ALA metabolites.

In the present study we determined *FADS1* ( $\Delta 5$ -desaturase), *FADS2* ( $\Delta 6$ -desaturase) and *Elongase-5* (*ELOVL5*) mRNA expression in peripheral blood of atopic eczema children (n=30) and healthy controls (n=60) by real-time reverse transcriptase polymerase chain reaction (RT-PCR). TaqMan low density array (TLDA) technology for RT-PCR was used. Changes in the activities of corresponding enzyme products were estimated from ratios of fatty acid product : precursor.

After correcting for multiple comparisons, *FADS2* mRNA expression was significantly lower in AE patients compared to controls (-33 %, p= 0.01). Index (DGLA/LA) of  $\Delta 6$ -desaturase activity, was significantly lower (p= 0.02) in AE patients compared to controls. There were no significant differences between groups in *FADS1* (p = 0.98) and *ELOVL 5* (p= 0.51) mRNA expression, or indices of  $\Delta 5$ -desaturase (p= 0.67) and *Elongase-5* (p= 0.35). These preliminary findings demonstrate that *FADS2* mRNA expression is significantly and selectively lower in the peripheral blood of atopic eczema children, and may contribute to dysregulated LC-PUFA biosynthesis.