

## ABNORMAL FATTY ACID METABOLISM IN PATIENTS WITH ATOPIC ECZEMA

S.WRIGHT\*, M.S MANKU\*, C.H BOLTON\*\*, T.A.B SANDERS\*\*\*

Early studies showed serum from children with atopic eczema to have a low iodine number, despite high serum levels of linoleic acid. Since the pathways of metabolism of the essential fatty acids (EFAs) were not known at that time, the significance of this was unclear.

Because of the increasing concern about the unwanted effects of long term treatment with topical steroids and in order to re-investigate these findings using current technology, we have undertaken a series of studies of plasma phospholipids, breast milk and adipose tissue total lipids in subjects with atopic eczema.

Total lipids were extracted into chloroform: methanol (2:1) and methylated directly (breast milk and adipose tissue) or after separation of the phospholipid fraction by thin layer chromatography (plasma). Analysis of fatty acid methyl esters was by gas chromatography.

In all tissues, derived fatty acids of both the n-6 and n-3 families were below control values, whereas linoleic acid was normal or elevated. Hence the ratio:

$$\frac{18:2n-6}{20:3n-6 + 20:4n-6}$$

which reflects the rate of conversion of linoleic acid was increased in all tissues examined in patients with atopic eczema (see table).

	Plasma PL	Breast milk	Adipose tissue
Atopic	2.55	9.5	20.68
Control	1.47	5.9	14.42

We conclude that patients with atopic eczema have a defect in the conversion of linoleic acid to its long-chain polyunsaturated metabolites present in all tissues. This defect seems likely to reside at the delta-6-desaturase step. Supplementation of the diet in patients with atopic eczema, using gamma-linolenic acid (the 6 desaturated derivative of linoleic acid) produces a return towards normal of the fatty acid profile and an improvement in subjective and objective symptoms and signs of the disease. Identification of the fatty acid abnormality in atopic eczema has allowed for the development of a rational and effective new treatment.

\* Scotia Pharmaceuticals, Guildford, Surrey, England

\*\* Dept of Medicine, Bristol University, England

\*\*\* Dept of Nutrition, King's College, London, England

*12% of 7yr old*

*1-2% of adult*