Red cell fatty acid profile and elemental diet in childhood Crohn's disease

Dear Sir,

Variation in the diet may alter the fatty acid composition of membranes. Previous studies by the author showed that both red cell and small intestinal microvillous membranes responded in a similar way to modification of dietary fat.[1] Alteration of the fatty acid profile of small intestinal membranes, alter their response to Cholera Toxin[2] and Rota-Virus Infection.[3] Crohn's disease and elemental diet may alter the fatty acid composition of red cell membranes. In this study we studied red cell fatty acid composition of Crohn's patients before and after 4-6 weeks on an elemental diet (028 scientific hospital supply). After an over night fast, the blood was collected from 27 children, 10 with Crohn's disease (2 females, 8 males a mean age of 13.5 years) before and after treatment and 17 healthy siblings on a normal diet (5 females, 11 males, a mean age of 12.8 years). Lipids were extracted from washed red blood cells using chloroform methanol (2:1) total cholesterol estimated by colorometric methods, total phospholipids estimated by measuring phosphorus. The fatty acid composition of total phospholipids was analyzed by gas liquid chromatography following. Transmethylation with boron-triflouride methanol. There was no significant difference between any of the fatty acid in active Crohn's patients and their siblings in contrast to previous studies.[4,5] An elemental diet for 4-6 weeks significantly reduced the concentration of red cell linoleic acid (P=0.02) and increased oleic acid (P<0.05) which is probably a reflection to their concentration in the diet, or secondary zinc deficiency (Table 1). Zinc concentration in an elemental diet (028) is only 4.2mg/100g. Although we did not measure zinc in our patients, previous studies[4] showed reversal of abnormal red cell fatty acid by 200 mg/day of zinc sulphate for 6 weeks. Erythrocyte fatty acid may be used as a reasonable and readily available marker for changes in fatty acid in intestinal membranes. Small changes in erythrocyte fatty acid were associated with more marked changes in small intestinal microvillous membranes, the latter appears to be more sensitive to dietary manipulation.[1]

Table 1 - Fatty acid composition of red cell phospholipids in Crohn's patients and siblings.

Fatty Acids	Control healthy sibling n = 17	Crohn's n=10	
		n before ED	n after ED
Palmitic acid	28.09±2.2	30.16±2.6	26.61±5.6
Stearic acid	18.51±3.7	17.51±2.7	17.47±3.4
Oleic acid	20.02±1.6	20.58±2.6NS	22.42±1.9**
Linoleic acid	17.32±1.9	16.02±2.5NS	13.39±2.2*
Arachidonic acid	16.05±1.7	15.72±2.9NS	18.11±3.3

n=number, ED=elemental diet, *=P<0.05, **=0.02

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