RED BLOOD CELL POLYUNSATURATED FATTY ACID N-6 TO N-3 RATIOS CORRELATE WITH ANXIETY AND DEPRESSION IN WOMEN WITH BREAST CANCER

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The ratio of n-3 to n-6 PUFA has been found to influence levels of biochemical mediators such as prostaglandins, cytokines and neurotransmitters. Hibbeln and Salem (1995) have proposed that the high rate of depression in Western society this century (Klerman 1988; Klerman and Weissman 1989) is related to low dietary intakes of n-3 PUFA. Some support for this hypothesis has been found from the study of Adams et al. (1995).

In a study which examined the relationships between psychosocial factors, nutritional status, immunity and hormones in women recently diagnosed (RDx) with breast cancer or who were long term survivors (LTS) of breast cancer, we have also investigated the relationship between anxiety and depression and ratios of n-3:n-6 PUFA in red blood cell membranes. This analysis included 74 RDx women who had survived for 6-12 months post-surgery. Anxiety and depression were measured via the Hospital Anxiety and Depresion scale (HADS) (Zigmond and Snaith 1983) and the Derogatis Stres Profile (DSP) (Derogatis 1987). Dietary intake of major nutrients was assessed via food frequency questionnaire and red blood cell polyunsaturated fatty acids (RBC PUFA) were assessed by gas chromatography.

The interactions were investigated via partial correlations that controlled for potential confounders such as age, SES, BMI, stage of cancer and treatments. The level of RBC arachidonic acid was significantly correlated with anxiety (HADS, R= +0.45, P= 0.004 and DSP, R= +0.32, P= 0.042). The ratio between arachidonic acid (AA) and eicosapentaenoic acid (EPA) in the RBC was correlated with anxiety (HADS, R= +0.31, P= 0.048 and DSP, R= +0.40, P= 0.012) and depression (DSP; R= +0.35, P= 0.028).

A high AA/EPA ratio is indicative of a low n-3 PUFA status (Sinclair et al. 1994). The nervous system, and synaptosomes in particular, is rich in docosahexaenoic acid (an n-3 PUFA) (Connor et al. 1992) and the findings of this study provide a possible link between nutrition and the greatly increased rates of depression in Western societies this century.

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