Letter to the Editor

Potential confounding in a study of dietary inflammatory index and cognitive function

Frith *et al.*[1] recently observed an inverse association between dietary inflammatory index (DII) and memory. Using the National Health and Nutrition Examination Survey (NHANES) data, they categorised self-reported 24-h dietary recall interviews to determine DII. The authors controlled for age, sex, race–ethnicity, measured BMI, self-reported smoking status, self-reported average hours of sleep each night, self-reported engagement in leisure-time moderate-to-vigorous physical activity and depression symptomology. From their analysis, they observed a consistent inverse association between DII and various memory types including episodic memory, working memory and semantic memory.

Although Frith *et al.* controlled for multiple variables, it seems that no indicator of socio-economic status such as education was controlled for in the analysis. According to a recent study by Sattler *et al.*[2], higher socio-economic status was associated with a 69 % reduced risk of developing mild cognitive impairment (which is associated with a much higher risk of developing subsequent Alzheimer's disease) compared with lower socio-economic status. Higher educational attainment showed an even stronger protective association with a reduced risk of mild cognitive impairment of 85 % compared with lower education. It is important to determine whether education, socio-economic status or both influence DII, as well as cognitive function. As both socio-economic status and education can be derived from NHANES data used by Frith *et al.*, these additional potential confounding factors that strongly influence cognitive function should be assessed and, if appropriate, included in regression models to determine an independent association of DII and memory.

It is also concerning that the data used by Frith *et al.* excluded individuals with one or more of the following chronic diseases: congestive heart failure, coronary artery disease, heart attack, stroke or physician-diagnosed diabetes. The number excluded was not indicated. The US Centers for Disease Control and Prevention reported diabetes prevalence of 25·2 % in individuals over 65 years of age in the US population[3]. If Frith *et al.* excluded a large percentage of individuals aged 60 years and older, then the sample is not representative of the American elderly population and generalisability is diminished. Further, results might be subject to selection bias.

Going forward, analyses should be performed by including individuals with chronic illnesses to be representative of the general elderly population sampled. Co-morbidity can be controlled for in the analysis, and sensitivity analyses can determine the effect of excluding persons with chronic diseases. In addition, it would be advisable to control for more confounding factors, including socio-economic status and education, to assess DII as an independent correlate of cognitive function. Finally, this association should be assessed in a longitudinal analysis relating baseline DII and change in DII to follow-up memory and change in memory.

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