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Factors associated with inflammation in older adults

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Dysregulated inflammatory processes are associated with an increased risk of chronic disease. As populations are ageing and life expectancy is increasing, it is essential that factors which influence the inflammatory status of elderly individuals and the impact of comorbidities thereupon are better understood. A clearer insight into the drivers of inflammation in older, free-living populations will facilitate the development of interventions that militate against the establishment of chronic disease.

We have recently completed a randomised controlled trial to determine the influence of a dietary intervention on the risk of infection and immune capacity in 217 older people (65–85 years old). We report those factors which are associated with inflammation at baseline. Information on medication use, chronic disease and smoking was collected and anthropometric measures including body mass index (BMI) were undertaken. Blood samples were collected for the analysis of innate and adaptive immune function, and high sensitivity C-reactive protein (CRP) levels. Expression of the early activation antigen CD69 on unstimulated lymphocytes was used as an indicator of immune activation and that on polyclonally activated lymphocytes as a marker of immune responsiveness. The CRP level is a non-specific index of inflammatory status.

CRP levels significantly increased with the BMI category, and linear regression revealed that having a BMI over 30 (95% CI 0.470–3.496) and being an ex-smoker (95% CI 0.504–3.760) were positively and significantly associated with CRP levels. The effect of BMI on CRP was quantified by re-running the linear regression model with BMI as a continuous variable. This revealed that an increase of 5 in the BMI is associated with a 0.8 mg/l increase in the level of CRP. A linear regression was completed to investigate the factors effecting the proportion and intensity of unstimulated and stimulated cells expressing CD69. Chronic disease was associated with the proportion of unstimulated cells expressing CD69. Gender and having a BMI over 30 were associated with the intensity of CD69 expression on unstimulated cells. Considering stimulated cells, BMI over 30 was associated with the proportion of cells expressing CD69 and age was associated with the intensity of the cells expressing CD69.

It is important to establish parameters which are associated with an increased risk of inflammation-mediated disease in the older population. This study confirms previous reports of an association between obesity and CRP levels[(1)]. Furthermore, it identifies a yet to be explored relationship between BMI and lymphocyte activation status/responsiveness in elderly individuals.

1. Khaodhiar L *et al*. (2004) *J Parenter Enteral Nutr* **28**, 410–415.