Chronic inflammation as predictor of 1-year hospitalization and mortality in elderly population

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ABSTRACT

Background Systemic low-grade inflammation is thought to be associated with an increased risk of adverse clinical outcomes in elderly population. We tested this notion with the goal of identifying useful potential biomarkers of 1-year hospitalization and mortality in the elderly population.

Design A total of 120 institutionalized older subjects were enrolled as participants in this study, including 90 women and 30 men (ranging in age from 68 to 105 years), selected from Santa Teresa nursing home (Oviedo, Spain). We studied functional status, morbidity, socio-demographic characteristics and several inflammation and inflammation-related markers.

Results The study included 95 non-hospitalized participants and 23 participants with at least one hospitalization during 1 year (19% of subjects). The study also included 100 survivors and 19 participants who died during the 1-year study (16% of subjects). In logistic regression models adjusted by age, sex, anti-inflammatory drug use and morbid conditions, high levels of interleukin 1 receptor antagonist (IL-1ra) and red blood cell distribution width (RDW) were associated with hospitalization and death at 1 year. Elevated levels of tumour necrosis factor α (TNF-α) were also associated with an increased risk of death at 1 year after adjusting for the same potential confounders. Multivariate logistic regression models showed that elevated serum levels of IL-1ra were intimately associated with 1-year subsequent hospitalization and mortality in aged subjects after adjusting for age, sex, anti-inflammatory drug use and morbid conditions.

Conclusions Current data suggest that IL-1ra is a predictor of 1-year hospitalization and mortality in the elderly population.

Keywords Chronic inflammation, Hospitalization, Mortality, Red cell distribution width, Tumour necrosis factor α.

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Introduction

Ageing is characterized by a low-grade inflammatory status that appears to have detrimental physiological effects on the elderly population [1]. Geriatric syndromes, such as frailty and age-related diseases like Alzheimer’s disease, hypertension, atherosclerosis, type 2 diabetes or osteoporosis are initiated or worsened by chronic inflammation [1–3]. Chronic inflammation is also related to disability and mobility limitation in elderly subjects, even in the absence of clinical disease [4,5]. However, literature about the association between hospitalization outcomes and chronic inflammation in the elderly population is scarce [6,7]. This is somewhat surprising because of the relevant health, social and economic implications of hospital admissions of elderly subjects and the need to identify risk factors at a stage of age-related decline that would be amenable to preventive interventions. Therefore, in this work, we tested the hypothesis that systemic low-grade inflammation is associated with increased risk of 1-year hospitalization in the elderly population. Furthermore, we also analysed the association between chronic inflammation and 1-year mortality. The ultimate goal was to identify potentially useful biomarkers predictive of both hospitalization and mortality in clinical practice.