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Abstract

Comparison of Metabolic Age and Health-Related Quality of Life (HRQoL) in Three Different Pro-Inflammatory Conditions Depending on Weight †

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Abstract: Background and objective: Systemic autoimmune diseases, viral infections (COVID-19) and obesity/metabolic syndrome (MS) are all characterized by a chronic inflammatory state with some putative shared physiopathological features. Biological age and HRQoL approaches have been applied as human health and aging indices. The objective of the METAINFLAMATION study was to analyze the differences and/or similarities between subjects with systemic lupus erythematosus (SLE), long-COVID and obesity/metabolic syndrome, which are all recognized inflammatory conditions, and to compare metabolic age and HRQoL depending on weight status in those patients. Methods: A total of 232 participants (≥18 years) were recruited whose anthropometric data were collected (height, weight, bioelectrical impedance analysis, waist circumference, hip circumference and blood pressure). The patients answered different questionnaires related to socio-demographic data, metabolic history, lifestyle (physical activity, sleep habits and nutrition) and HRQoL. Metabolic age and HRQoL (SF-12) were assessed with validated tools. Differences and interactions among the three types of diseases and body mass index (BMI) as stratified by p50 were studied using a 3 × 2 (diseases × adiposity) factorial ANOVA design and with appropriate post hoc contrasts. Results: The analyses revealed significant differences in biological age ($p < 0.001$) between each disease and BMI (high vs. low). Interestingly, the type of disease and BMI showed an interaction concerning biological age ($p < 0.05$). Regarding HRQoL, significant differences ($p < 0.01$) were found between each pro-inflammatory condition and between both BMI groups for the PCS (Physical Component Summary), while only the MCS (Mental Component Summary) showed statistical differences among diseases ($p < 0.001$) but not for BMI ($p = 0.42$). Additionally, the PCS evidenced a statistically significant modification of the effect ($p < 0.01$) depending on the type of disease as conditioned by the BMI (high vs. low) but not for the MCS ($p = 0.13$). Discussion. Featuring precision indices such as biological age and HRQoL in patients with SLE, long-COVID, and obesity/metabolic syndrome and interactions with ponderal status enables better monitoring of these inflammatory diseases. Metabolic individualization and the early prevention of associated complications can be achieved by using validated biomarkers and scores, seeking the personalization of therapeutic management with clinical precision.

Keywords: lupus; long COVID; obesity; inflammation; quality of life

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