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Frailty syndrome is associated with altered circulating redox balance and increased markers of oxidative stress.

Serviddio G, Romano AD, Greco A, Rollo T, Bellanti F, Altomare E, Vendemiale G.

Department of Medical and Occupational Sciences, University of Foggia, IRCCS Casa Sollievo della Sofferenza Hospital, Foggia, Italy.

Frailty Syndrome (FS) is a condition described in aging and characterized by physical vulnerability to stress and lack of physiological reserve. In this study we aim to define whether circulating oxidative stress correlates to frailty in terms of glutathione balance and oxidative protein damage. In 62 elderly outpatients, classified as frail patients according to Fried's criteria, evaluation of reduced Glutathione (GSH), Oxidized Glutathione (GSSG), Tumor Necrosis Factor- α , Malonaldehyde-(MDA) and 4-hydroxy-2,3-nonenal-(HNE) protein plasma adducts were performed. A significant increase in the GSSG was observed in patients with FS when compared to non-frail. No difference was shown in the GSH amount, suggesting a glutathione oxidation more than impairment of the synthesis. TNF- α , MDA- and HNE-adducts, were significantly higher in FS as compared to non-frail patients. A logistic regression model correlating FS with redox balance showed a close relationship between glutathione ratio (OR=1.8, 95% CI=1.2-2.5) and MDA adducts (OR=2.8, 95% CI=1.6-4.7) to frailty. Our findings show an association between oxidative imbalance and Frailty Syndrome. GSSG/GSH ratio and plasma protein adducts strongly predict the frailty conditions and seem to be reliable and easily measurable markers in the context of the multidimensional analysis of elderly patients.

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