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Effect of redox imbalance on protein modifications in lymphocytes of psoriatic patients

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Abstract

Lymphocytes are one of the most important cells involved in the pathophysiology of psoriasis; therefore, the aim of this study was to assess the redox imbalance and protein modifications in the lymphocytes of patients with psoriasis vulgaris (PsV) or psoriatic arthritis (PsA). The results show a stronger shift in redox status to pro-oxidative conditions (observed as an increased reactive oxygen species level, a decrease in catalase activity and lower levels of glutathione peroxidase and vitamin E compared with healthy controls) in the lymphocytes of PsA than PsV patients. It is also favoured by the enhanced level of activators of the Nrf2 transcription factor in lymphocytes of PsV compared with decreased of these proteins level in PsA. Moreover, the differential modifications of proteins by lipid peroxidation products 4-oxononenal (mainly binding proteins) and malondialdehyde (mainly catalytic proteins with redox activity), promoted a pro-apoptotic pathway in lymphocytes of PsV, which was manifested by enhanced expression of pro-apoptotic caspases, particularly caspase 3. Taken together, differences in Nrf2 pathway activation may be responsible for the differential level of redox imbalance in lymphocytes of patients with PsV and PsA. This finding may enable identification of a targeted therapy to modify the metabolic pathways disturbed in psoriasis.

Keywords: apoptosis; lymphocytes; protein modifications; psoriasis; redox balance.

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