Cholinergic dysregulation in patients with psoriatic arthritis

Authors:Hila Nochomovitz*, Victoria Furer*, Shlomo Berliner, Ori Elkayam, Ori Rogovsky, Shani Shenhar-Tzarfaty.* equal contribution

Department of Rheumatology Tel Aviv Sourasky Medical Center,Sackler Faculty of Medicine, Tel Aviv University

ABSTRACT

Background: A sympathetic/parasympathetic shift has an essential role in promoting inflammation. Acetylcholine is the main parasympathetic neurotransmitter and regulator of inflammation, which activity can be assessed by the level of cholinesterase in the serum.

Objectives: To assess cholinesterase activity in a real-life cohort of patients with psoriatic arthritis (PsA) compared to apparently healthy controls and explore the correlation between the cholinergic status and PsA disease activity.

Methods: We conducted a cross-sectional study in 96 PsA patients and apparently healthy controls. All patients were evaluated for disease activity; C-reactive protein (CRP), serum cholinesterase activity levels, and cholinergic status (CS) were assessed in both patients and controls.

Results: The levels of AChE and CS were similar in both PsA patients and controls. PsA patients treated with biologics had significantly lower levels of AChE and CS compared to patients under non-biologic treatment: 447.4 (substrate hydrolyzed per minute per milliliter) versus 526 (p 0.005) and CS 1360.9 versus 1536 (p 0.029) respectively, and lower levels of CRP, 2.5 mg/L versus 3.2 mg/L (p 0.068), respectively. There was an association between CRP levels, AChE activity (r= 0.291, p=0.008) and cholinergic status (r=0.247, p=0.026) in patients with PsA but not in the controls. No correlation between AChE activity, SC, and the indices of PsA was found.

Conclusions: This is the first study to demonstrate similar cholinesterase activity in patients with psoriatic arthritis compared to the general population, yet highlighting a

potential effect of biologic treatment on cholinergic activity in patients with PsA. Further research of cholinergic status in rheumatic disease is warranted.