IL-17A drive oxidative stress and cell growth in A549 cell line: potential protective action of Mediterranean diet

A. Montalbano (PALERMO, Italy), R. Gagliardo (PALERMO, Italy), G. Albano (PALERMO, Italy), M. Profita (PALERMO, Italy)

Abstract

Background: IL17A drive inflammation and oxidative stress promoting the progression of chronic lung diseases, such as asthma, chronic obstructive pulmonary disease (COPD), lung cancer, and cystic fibrosis. Oleuropein (OLP) is a polyphenolic compound present in olive oil tree fruits showing antioxidant activity, oxidative stress resistance, anti-inflammatory activity, anticarcinogenic potential, and other positive impacts over human health.

Aims: This study evaluated the effects of OLP in the mechanisms of oxidative stress, cell proliferation, apoptosis, and DNA damage (pH2AX expression and by Comet Assay test) generated in human alveolar basal epithelial cell line (A549) stimulated with IL-17A.

Results: Our results showed that OLP reduces oxidative stress ( Reactive Oxigen Species, JC-1), DNA damage (Olive Tail length data, γH2AX phosphorylation-ser139) expression drive in A549 cells by IL-17A. Furthermore, we determined the anti-migratory potential of OLP in the cells chronically exposed to IL-17A[MP1] by Scratch test. Finally, although OLP did not affect cell viability, we observed its capacity to induce cell apoptosis and to reduce a single cell capacity to grow into a colony (like a cancer phenotype) with IL-17A.

Conclusions: OLP might be useful to protects lung epithelial cells from the mechanisms of oxidative stress and cell proliferation, involved in the generation of DNA damage and cell growth during lung diseases such as cancer. Our data support the concept of a positive effect of Mediterranean diet on human health regarding lung diseases.