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Immunomodulation and antioxidant capacity of hydroxytyrosol present at oleic acid-rich sunflower oil

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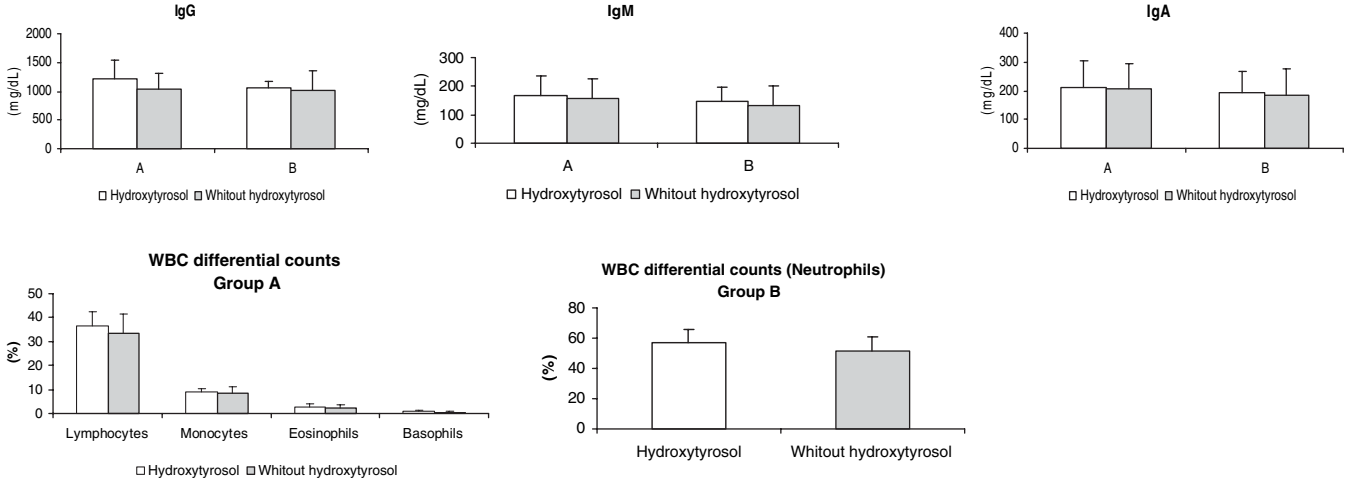
Typical components of the Mediterranean diet such as olive oil and red wine contain high concentrations of phenols that may have important antioxidant and immunomodulation roles. The main phenols identified in extra-virgin olive oil belong to different classes: simple phenols such as 3,4-dihydroxyphenylethanol and p-hydroxyphenylethanol; secoiridoids e.g. oleuropein, the aglycone of ligstroside and their respective decarboxylated dialdehyde derivatives[1,2]. These phenols have been suggested to prevent oxidative damage and beneficially modify immune and inflammatory responses[3]. The aim of the present study was to evaluate the effect of oil (sunflower oil) containing added hydroxytyrosol (HT; 'Oleoactive from Koipesol'; Sos Cuetara SA, Madrid, Spain) consumed at 45–50 mg/d, on the immune cells and oxidation variables in healthy adults. Thus, twenty-two healthy subjects of both genders (20–45 years) were recruited for a cross-over design study. The subjects were divided into two groups of eleven and assigned to one of two treatments for a period of 8 weeks: group A, 3 weeks of oil with added HT, 2 weeks of wash-out and 3 weeks of sunflower oil without HT; group B, 3 weeks of oil without HT, 2 weeks of wash-out and 3 weeks of oil with added HT. Leucocytes were analysed using an automatic blood-cell counter. T (CD3, CD4, CD8) and B (CD19) lymphocyte subsets and natural killer cells (CD56 + 16) were studied by flow cytometry using peripheral blood marked with monoclonal antibodies. The oxidative and phagocytic capacities of polymorphonuclear leucocytes were quantified *in vitro* after incubating lymphocytes with opsonised *Escherichia coli*. Finally, serum Ig levels were measured by nephelometry. All variables were analysed at the beginning of the study and at 3, 5 and 8 weeks. No significant changes in leucocytes, differential cell counts and lymphocyte subsets were observed in the two groups during the study. Nevertheless, the oxidative capacity showed a tendency to increase in both groups after consuming oil with added HT. On the other hand, in group A the percentages of lymphocytes, monocytes, eosinophils and basophils and the Ig levels showed a tendency to increase after the consumption of oil with added HT. However, in group B leucocyte counts, the percentage of neutrophils and Ig levels showed a tendency to increase (Figure). In conclusion, HT could improve the immune response, but further studies with increasing levels of intake or periods of consumption of HT are required to establish whether the effects are significant.



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