

Effect of Minor Components of Virgin Olive Oil on Topical Antiinflammatory Assays

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Interest in the health-promoting effects of virgin olive oil, an important part of the “Mediterranean diet”, prompted us to determine the antiinflammatory effects of erythrodiol, β -sitosterol and squalene, identified as major components of the so-called “unsaponifiable fraction” of virgin olive oil, as well as of the phenolic compounds from the “polar fraction”: oleuropein, tyrosol, hydroxytyrosol and caffeic acid. Their activities were compared to those of both, total unsaponifiable and polar fractions. This study was designed to analyse the antiinflammatory effect of these specific compounds from virgin olive oil on edema in mice induced by either arachidonic acid (AA) or 12-O-tetradecanoylphorbol acetate (TPA). The inhibition of the myeloperoxidase (MPO), marker enzyme of the accumulation of neutrophils in the inflamed tissue, was also investigated by the TPA model. The topical application of the olive oil compounds (0.5 mg/ear) produced a variable degree of antiinflammatory effect with both assays. In the auricular edema induced by TPA, β -sitosterol and erythrodiol from the unsaponifiable fraction of the oil showed a potent antiedematous effect with a 61.4% and 82.1% of inhibition respectively, values not very different to that of the reference indomethacin (85.6%) at 0.5 mg/ear. The four phenolics exerted a similar range of inhibition (33–45%). All compounds strongly inhibited the enzyme myeloperoxidase, indicating a reduction of the neutrophil influx in the inflamed tissues.

The strongest inhibitor of AA edema was the total unsaponifiable fraction which inhibition was 34%, similar to that obtained by the reference drug dexamethasone at 0.05 mg/ear. Among the phenolics, oleuropein also produced an inhibition of about 30% with the same dose, but all the other components were found less active in this assay. The anti-inflammatory effects exerted by both unsaponifiable and polar compounds might contribute to the potential biological properties reported for virgin olive oil against different pathological processes.