FORUM

“Agricoltura, Alimentazione e Salute: le sfide della ricerca per garantire produzione, qualità e proprietà salutistiche degli alimenti”

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ABSTRACT

Titolo: Gli alimenti nella prevenzione di malattie croniche e tumorali: Casi studio

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Stato dell’arte del settore:
Oxidative stress is thought to play a significant role in the pathogenesis of inflammatory disease, such as pleurisy, arthritis and Crohn's disease. Endogenous antioxidants such as superoxide dismutase (SOD), glutathione, and catalase are normally able to counteract oxidative stress. However, inflammation increases the demand for these important antioxidants and results in an imbalance between pro-oxidants and antioxidants, with subsequent tissue damage.
Olive oil is an integral ingredient of the traditional Mediterranean diet and several studies attribute many of the healthy advantages of this diet. It is well known for its minor components exerting either anti-inflammatory or antioxidant effects.
Furthemore, a number of studies have also demonstrated positive effects of nut consumption in modifying lipid risk factors for coronary heart disease. Although particular attention has been given to the unsaturated fatty acids, it has been recently suggested that the polyphenols play a role in the beneficial effects observed after nut consumption. The polyphenols localized in almond skins include a variety flavonols, flavanones and simple phenolic acids which have a role in reducing risk factors against chronic inflammatory diseases and ageing disorders . The antioxidant and free radical scavenging activity of almond skin polyphenols have also been demonstrated.
Obiettivi della ricerca nel settore:
The objectives of these present studies were to address if the oleuropein aglycone and natural almond skin (NS) have beneficial effects on the modulation of the acute and chronic inflammatory response such as carrageenan induced pleurisy, collagen-induced arthritis CIA and colitis induced by dinitrobenzene sulfonic acid (DNBS) in animal models.
Strategie di ricerca da porre in essere:
In this study we reported that oleuropein aglycone (given at 40µg and 100µg/kg i.p. in the pleurisy model 30 min after the challenge with carrageenan, or at 20µg/kg and 40µg/kg every 24 h, starting from day 25 to day 35 in the arthritis model) exerts potent anti-inflammatory effects: inhibition of neutrophil infiltration into the lung and joint tissue, reduction of adhesion molecules expression in the vascular endothelium of inflamed lungs, inhibition of cytokines (TNF-α, IL-1β), and chemokines (MIP-lα and MIP-2) expression, decrease of NO exudate levels and lipid peroxidation in carrageenan-treated mice and also delayed development of clinical indicators, and histological injury) in vivo. Furthermore, oleuropein aglycone reduced the increase in the staining (immunohistochemistry) for nitrotyrosine and poly (ADP-ribose) polymerase in both inflamed tissues, and the expression of inducible nitric-oxide synthase (iNOS) and cyclooxygenase-2 (COX-2) in the joints from collagen-treated mice.
Moreover, colitis was induced in mice by intracolonic instillation of dinitrobenzene sulfonic acid (DNBS). NS powder was administered daily orally (30 mg/kg). Four days after DNBS administration, colon NF-κB and p-JNK activation was increased as well as TNF-α and IL-1β productions. Neutrophil infiltration, by myeloperoxidase (MPO) activity, in the mucosa was associated with up-regulation of ICAM-1 and P-selectin.
Immunohistochemistry for i-NOS, nitrotyrosine and poly (ADP-ribose) polymerase (PARP) showed an intense staining in the inflamed colon. Treatment with NS powder significantly reduced the appearance of diarrhea and body weight loss. This was associated with a significant reduction in

colonic MPO activity. NS powder also reduced NF-κB and p-JNK activation, the pro-inflammatory cytokines release, the appearance of i-NOS, nitrotyrosine and PARP in the colon and reduced the up-regulation of ICAM-1 and the expression of P-selectin.

Conclusioni:

The data presented in these studies demonstrate that oleuropein aglycone and natural almond skin reduce the development of acute and chronic inflammation.

Moreover, future studies using different models are needed in order to better clarify the possible use of oleuropein aglycone and natural almond skin powder for the treatment of inflammatory diseases in patients.