Therapeutic potential of Vanillin and its main metabolites to regulate the inflammatory response and oxidative stress

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Abstract

Many phenolic compounds found in foods and medicinal plants have shown interesting therapeutic potential and have attracted the attention of the pharmaceutical industry as promising pharmacologically active compounds in health promotion and disease prevention. Vanillin is a phenolic aldehyde, widely used as a flavoring agent in the food, pharmaceutical, and cosmetics industries. A variety of pharmacological activities has been attributed to this compound and its main metabolites, vanillic acid and vanillyl alcohol, including their anti-inflammatory ability. The relationship of the anti-inflammatory effects of vanillin, vanillic acid, and vanillyl alcohol and their actions on oxidative stress is well established. Considering that the inflammatory process is related to several pathologies, including new diseases with few therapeutic options, and limited efficiency, the search for effective treatment strategies and discovery of new anti-inflammatory agents capable of modulating inflammation becomes necessary. Therefore, in this review we discuss the therapeutic potential of vanillin and its main metabolites for the treatment of inflammatory diseases and their actions on redox status. In addition, the molecular docking evaluation of vanillin, its metabolites and isoeugenol was carried out into the phospholipase A2 binding site.

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