Comparison of the relative activities of a-tocopherol and pmc on platelet aggregation and antioxidative activity.

許準榕
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Abstract

In this study, PMC (2,2,5,7,8-pentamethyl-6-hydroxychromane), a potent antioxidant derived from alpha-tocopherol, dose-dependently inhibited agonist-induced platelet aggregation in human platelet-rich plasma. PMC is over 5-10 times more potent than alpha-tocopherol in inhibiting human platelet aggregation. Moreover, PMC (25-350 microM) dose-dependently reduced the relative fluorescence intensity of platelet membrane tagged with diphenylhexatriene (DPH). PMC is about 6-times more potent than alpha-tocopherol on this effect. Furthermore, antioxidative activity of PMC was investigated using two in vitro models. PMC inhibited non-enzymatic iron-induced lipid peroxidation in rat brain homogenates with an IC50 value of 0.21+/-0.05 microM. It was more potent than alpha-tocopherol or other classical antioxidants. PMC also scavenged the stable free radical 1,1-diphenyl-2-picrylhydrazyl (DPPH). The concentration of PMC resulting in a decrease of 0.20 in the absorbance of DPPH was about 12.1+/-3.6 microM, was comparable in potency to alpha-tocopherol, butylated hydroxytoluence and Trolox. The antiplatelet activity of PMC may possibly be due initially to an increase in fluidity of the platelet membrane followed by inhibition of platelet aggregation. Our results indicate that PMC is a potentially effective antioxidant and antiaggregating agent, and could be helpful the design of compounds with more clinical effectiveness.