Anti-inflammatory effect of rutin on rat paw oedema, and on neutrophils chemotaxis and degranulation.

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Abstract

BACKGROUND: Rutin, a natural flavone derivative, is known for its pharmacological properties. We have previously reported that this flavonol exerted a potent inhibitory effect on respiratory burst of fMet-Leu-Phe-stimulated neutrophils, as well as on phosphoinositide 3-kinase gamma activity in a cell free system. In the present study, the anti-inflammatory effect of rutin was investigated in vivo and in vitro.

METHODS: Rutin or aspirin (100 mg/kg, body weight) were given orally to rats 1 hour before paw oedema induction, using lambda-carrageenan 1%. The rat paw volume was measured by mean of plethysmometer, initially and during 6 hours. The chemotaxis of neutrophils towards 10(-7) M fMet-Leu-Phe was performed using 48-well chemotaxis chamber. Neutrophils that migrated through 5 microm pore size polycarbonate filter, in presence or in absence of rutin, were counted microscopically. Elastase exocytosis of either phorbol 12-myristate 13-acetate or fMet-Leu-Phe/cytochalasin B-stimulated neutrophils was assessed in absence or in presence of rutin using the synthetic substrate N-Suc-Ala-Ala-Ala-p-nitroanilide. The absorbance of released p-nitroaniline was measured at 405 nm using microplate reader.

RESULTS: The maximal swelling in placebo group was observed at 5 hours, after lambda-carrageenan injection. Oral administration of rutin reduced rat paw swelling starting 2 hours after lambda-carrageenan injection. Rutin reduced significantly (p < 0.05) and in a dose-dependant manner the polymorphonuclear neutrophils chemotaxis to fMet-Leu-Phe. Furthermore, elastase exocytosis, induced by both stimuli, was partially inhibited by rutin up to 25 microM.

CONCLUSION: The present study revealed that rutin possesses anti-inflammatory properties.

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