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Title: Inhibition of matrix metalloproteinase-2 activity by propranolol in immunocompetent cells

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Body: Introduction: Matrix metalloproteinases (MMPs) are a large group of proteases degrade the extracellular matrix proteins and have a major role in inflammation. Matrix metalloproteinase-2 (MMP-2) belongs to MMPs family plays an important role in some inflammatory mediated respiratory disorders such as chronic obstructive pulmonary disease (COPD) and asthma. Propranolol (a non selective beta-adrenergic blocker) has been widely used for treatment of several cardiovascular complications such as arterial hypertension and arrhythmias. Anti-inflammatory effects of propranolol have also been reported. Objectives: In this study the effect of propranolol on MMP-2 activity in human peripheral blood mononuclear cells (PBMCs) has been investigated in vitro. Methods: Human PBMCs were cultured in complete RPMI medium. The cells at logarithmic growth phase were stimulated with phytohemagglutinin (PHA) (at optimal concentration) and then incubated with different concentrations of propranolol (4×10^{-7} - 4×10^{-4} M) for 48 hours. The gelatinolytic activity of MMP-2 in cell culture supernatants was tested by zymography. Results: Propranolol significantly decreased the MMP-2 activity in PHA-stimulated human PBMCs dose-dependently compared to untreated control cells. Conclusion: According to the results of the present study propranolol down-regulates the MMP-2 activity in human PBMCs. Thus the anti-inflammatory effects of propranolol may be in part due to its inhibitory effects on MMP-2 activity. Therefore propranolol along with its long-term usage in cardiac problems might be a useful tool in planning of therapeutic approaches for inflammatory-based disorders such as COPD and asthma.