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Up-regulation of MMP-9 activity in mononuclear cells by a bacterial endotoxin

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Background: Endotoxin, recognized as lipopolysaccharide (LPS), is a component of the surface membrane of Gram-negative bacteria. Bacterial endotoxins are active microbial agents simply disseminate in the environment and could provoke a series of immunopathogenic effects. Endotoxins have important role in inflammation and induction of proinflammatory cytokines.
Objectives: The inflammatory reactions caused by endotoxins are associated to the activation of immune cells such as macrophages. One group of inflammatory mediators is matrix metalloproteinases (MMPs), a family of enzymes with essential role in degradation of extracellular matrix. In this study, the effect of LPS on MMP-9 activity in human peripheral blood mononuclear cells (PBMCs) in vitro has been assessed.
Materials and Methods: The human PBMCs were isolated from the venous blood of healthy volunteers by ficoll-hypaque-gradiant centrifugation. Then the PBMCs were cultured in complete RPMI medium. The cells at logarhytmic growth phase were incubated with LPS at optimum concentration for 24 hours. Afterward the cell culture supernats were collected and MMP-9 activity was evaluated by gelatin zymography technique.
Results: LPS significantly up-regulated the MMP-9 activity in human PBMCs after 24 hours incubation compared with non stimulated control cells.
Discussion: The results of this study showed that LPS increases MMP-9 activity in PBMCs. Thus LPS role in inflammation may be in part due to its enhancing effect on MMP activity.
Conclusion: Because of widespread prevalence of LPS in the environment and also its adverse effects on health conditions, further studies to determine the relation between
LPS and MMPs level in vivo and also understanding the underlying mechanism(s) are justified.
Key words: MMP-9, lipopolysaccaride, PBMCs.