

Tumor necrosis factor-alpha contributes to the inhibition of aggregation and to the increased reactive oxygen species formation in platelets of mice injected with lipopolysaccharide

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Abstract

Treatment of rats with lipopolysaccharide (LPS) decreases aggregation and enhances reactive oxygen species (ROS) formation in platelets, but this is not observed when platelets are incubated with LPS. To investigate if any cytokine generated after LPS injection was involved in these effects on platelets, we treated the mice with antibody anti-TNF- α (infliximab) before LPS injection and evaluated aggregation and ROS formation in platelets. We concluded that TNF- α is involved in the aggregation reduction and in the increased formation of ROS in platelets of LPS-injected mice.

Key words: LPS, platelets, TNF- α .

Introduction

Lipopolysaccharide (LPS), a main constituent of Gram-negative bacterial membrane, is largely used as a tool to study sepsis, a problem in all over the world. Platelets have been described as important cells in sepsis, and the reduction of circulating platelets is considered a marker of the severity of this condition. Recently, our group showed that the treatment of rats with lipopolysaccharide (LPS) causes thrombocytopenia, reduces aggregation and increases reactive oxygen species (ROS) formation in platelets, but the last two effects is not observed when platelets are incubated with LPS.

Results and Discussion

Infliximab did not prevent the thrombocytopenia after LPS injection, but significantly augmented the platelet aggregation compared to the group injected just with LPS (increase of 52%). In ADP-activated platelets of LPS-injected mice, generation of ROS was increased by 2.9-fold compared to the saline-injected group. This increased ROS production was totally prevented when the mice were treated with infliximab before LPS injection. Aggregation or ROS generation in platelets were not affected in the group injected only with infliximab compared to the group injected with saline.

Conclusions

TNF- α does not participate of the thrombocytopenia observed in the sepsis induced by LPS. However, TNF- α has an important role in the inhibition of aggregation and in the increased ROS generation in platelets in this experimental model of sepsis.

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