INNATE IMMUNE ROLES AND COMPOSITION OF SEPSIS-TRIGGERED LIPID DROPLETS

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Sepsis is a systemic inflammatory response syndrome secondary to an infectious process with some degree of organic dysfunction. At intracellular level, the increased lipid droplet (LDs) biogenesis have been demonstrated in septic patients and experimental models of sepsis. LDs are dynamic and complex organelles that provide all eukaryotic cells with lipid substrates. Many details about the pathogen / LDs interaction are still unknown. Recent results indicated that LD participate in pro-inflammatory response. Moreover, in Drosophila was reported that the protein content of LDs might have antibacterial, mainly due to protein content of this organelle. However, the participation of LDs in antibacterial activity was not explored in mammals. Our objective in this work was to analyze the participation of sepsis-triggered LDs in the antimicrobial response during sepsis. For the contribution of LD to systemic infection, were performed the sepsis model induced by cecal ligation and punctures (CLP) in C57BL / 6 mice and we treated septic animals with A922500, an inhibitor of enzyme DGAT-1. After 6h of surgery, we observed that sepsis induced the LD biogenesis in peritoneal leukocytes, and the inhibition of this biogenesis was followed by the increased of numbers of bacteria both in the serum and peritoneal lavage when compared to untreated septic animals. Moreover, the inhibition of LD biogenesis also inhibited the accumulation the level of leukotriene B_4, IL-6 and MCP-1 in peritoneal lavage. After 24h, sepsis induced increased of levels of hepatic LDs, which was inhibited by DGAT-1 inhibitor. Moreover, the bacterial level was higher in serum of CLP animal treated with A922500 than in untreated septic mice. In addition, to analysis of a direct role of LD at antibacterial activity, hepatic LDs are extracted and purified by sucrose gradients. We observed that LD proteins from septic mice have *in vitro* antibacterial capacity. Using western blot, we evaluate potential protein candidates for this antibacterial capacity. Our preliminary results indicate that LD is involved in the response to bacterial infection. For the best elucidation of the nature of this relationship and the contribution of lipid LD to antibacterial response more experiments will be performed.

Keywords: Lipid droplets, antibacterial activity, innate immunity

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