Modulation Of Lipid Biosynthesis And Plasma Lipoproteins During Dengue Virus Infection In A Mouse Model

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INTRODUCTION: Dengue is one of the most widespread mosquito-borne human pathogens worldwide, whose etiologic agent is a flavivirus, dengue virus (DenV). There is evidence that liver damage is characteristic of severe disease associated with abnormal lipid metabolism of infected patients. The aim of this study was to investigate changes in lipid metabolism of serum and liver tissue in vivo in animal model of severe dengue. MATERIAL AND METHODS: We quantified both hepatic and serum lipids, lipoproteins and trasaminases and evaluated enzyme activity of fatty acid synthase (FAS) through colorimetry assay. Mice were infected intraperitoneally with 100 PFU of DENV adapted (n=5) or apyrogen PBS (n=5). The animals were sacrificed by cervical displacement on 6 days after infection. Blood samples were collected through the ocular plexus for viral titer, platelet count, hematocrit and serum analysis. Liver samples were collected for assessment of viral replication by quantification of infectious particles, enzyme kinetics and lipid quantification. RESULTS AND DISCUSSION: In infected group, there was severe thrombocytopenia, hepatomegaly with curved edges and whitish steatotic appearance and a increase of trasaminases, linked with liver damage. Viremia and hepatic viral load were both $10^5$ PFU/mL or mg. We observed a significant increase in both serum and hepatic cholesterol and triglyceride in infected group showing an accumulation of lipids. FAS activity increased ~ 50% and we observed a change in kinetics profile, suggesting a modification in the behavior of enzyme. CONCLUSION: The results showed a large accumulation of lipids in liver and this change may be associated with an increase in hepatic lipid biosynthesis that seems to be associated with increased viral infection and liver damage. In fact, the study of these changes is important for understanding the pathology and viral behavior.

Palavra chave: dengue virus, lipid metabolism, fatty acid synthase
Patrocínio: CNPq