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Acute liver failure associated to high number of natural killer cells expressing perforin and granzymes

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Background Acute liver failure (ALF) is a severe clinical syndrome caused due to extensive liver damage associated to inflammatory process that can be induced by several etiologies, like virus, drugs and autoimmune responses. The main clinical aspects are encephalopathy and coagulopathy occurring abruptly in individuals with previously normal hepatic function. Despite recent advances in clinical management of liver function, hepatic transplantation is a single promising therapeutic option. The same agents involved in ALF may induce less severe forms of hepatic disease, and several studies have associated the intensity of immune response to the liver damage. Some previous studies showed that natural killer (NK) cells may be involved with liver damage in several liver diseases. However, the precise role of NK cells in ALF is still unknown. In the present study, we have investigated the role of NK cells and its possible mechanisms that could be related to extensive liver damage in ALF.

Participants & Methods: The study protocol was approved by the Ethical Committee for Human Research of the Fundação Oswaldo Cruz (Fiocruz), Rio de Janeiro, Brazil. Informed consent was obtained from all subjects (CEP Fiocruz.no. 22/03). Blood samples from 16 patients who developed ALF were obtained during liver transplantation procedures, which were realized in Hospital Federal de Bonsucesso, Rio de Janeiro, Brazil. Blood samples from 10 benign acute hepatitis cases and 6 healthy individuals were used as controls. These samples were obtained in the Laboratório de Desenvolvimento Tecnológico em Virologia (LADTV) – Fiocruz. All steps of the study have been conducted on LADTV. In order to analyze specific cell phenotype markers, flow cytometry was done to specifically identified molecules, CD56 as well as perforin and granzymes. Statistical analysis of results obtained by cytometry was done by use of the program PRISM 4.0 (GraphPad Inc., San Diego, CA, USA).

Results: Our preliminary findings showed a statistically significant high number of NK cells expressing perforin and granzymes in ALF patients when compared to controls ($p<0.05$).

Conclusion: These findings suggest a role for NK cells in ALF, which may include the extensive cytotoxic damage by production of perforin and granzymes during inflammatory responses.

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