Abstract

Abnormal surface expression of HLA-DR by leukocytes is associated with a poor prognosis in critical care patients. Critical care patients often receive total parenteral nutrition with lipid emulsion (LE). In this study we evaluated the influence of fish oil LE (FO) on human monocyte/macrophage (M\(^{\circ}\)) expression of surface HLA-DR under distinct activation states. Mononuclear leukocytes from the peripheral blood of healthy volunteers (n = 18) were cultured for 24 hours without LE (control) or with 3 different concentrations (0.1, 0.25, and 0.5%) of the follow LE: a) pure FO b) FO in association (1:1 v/v) with LE composed of 50% mediumchain triglyceride and 50% soybean oil (MCTSO), and c) pure MCTSO. The leukocytes were also submitted to different cell activation states, as determined by INF addition time: no INF addition, 18 hours before, or at the time of LE addition. HLA-DR expression on M\(^{\circ}\) surface was evaluated by flow cytometry using specific monoclonal antibodies. In relation to controls (for 0.1%, 0.25%, and 0.5%: 100) FO decreased the expression of HLA-DR when added alone [in simultaneously-activated M\(^{\circ}\), for 0.1%: 70 (59 ± 73); for 0.25%: 51 (48 ± 56); and for 0.5%: 52.5 (50 ± 58)] or in association with MCTSO [in simultaneously-activated M\(^{\circ}\), for 0.1%: 50.5 (47 ± 61); for 25%: 49 (45 ± 52); and for 0.5%: 51 (44 ± 54) and in previously-activated M\(^{\circ}\), for 1.0%: 63 (44 ± 88); for 0.25%: 70 (41 ± 88); and for 0.5%: 59.5 (39 ± 79)] in culture medium (Friedman p < 0.05). In relation to controls (for 0.1%, 0.25%, and 0.5%: 100), FO did not influence the expression of these molecules on non-activated M\(^{\circ}\) [for 0.1%: 87.5 (75 ± 93); for 0.25%: 111 (98 ± 118); and for 0.5%: 101.5 (84 ± 113)]. Results show that parenteral FO modulates the expression of HLA-DR on human M\(^{\circ}\) surface accordingly to leukocyte activation state. Further clinical studies evaluating the ideal moment of fish oil LE infusion to modulate leukocyte functions may contribute to a better understanding of its immune modulatory properties.

Keywords

Parenteral fat emulsions, HLA-DR, Fish oil.