Myeloid-derived suppressor cells are closely associated with disease progression in patients with HBV-related acute-on-chronic liver failure

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Background: MDSCs are a heterogeneous subset of immature myeloid cells with the potent ability to suppress T-cell responses through expression of increased levels of inducible nitric oxide synthase (iNOS), ROS and arginase and the shortage of L-arginine can inhibit T-cell proliferation through decreasing their expression of CD3 ζ-chain. The frequency and possible role of MDSCs are rarely studied in HBV-related ACLF (Acute-on-chronic Liver Failure) patients.

Methods: 25 HBV-related ACLF patients were enrolled in HBV-ACLF group, 15 of which were in early stage, 10 in middle and advanced stage. CHB group were consist of 26 mild to moderate patients and 16 severe patients, 18 healthy volunteers were admitted as healthy controls. The frequency of MDSCs and CD3 ζ-chain expression in CD8+T cells in three groups were detected by flow-cytometry. 8 patients with ACLF were enrolled and followed up for 4 weeks.

Results: MDSCs frequencies in peripheral blood mononuclear cells (PBMCs) were significantly increased in HBV-ACLF patients when compared with healthy controls and CHB patients. HBV-ACLF patients in middle to advanced stage had a higher frequency of MDSCs than those of early stage According to 4-week observation of ACLF patients, the peripheral MDSCs remained at high levels in the non-survival group, whereas the survival group displayed a gradual decline. CD3 ζ-chain expression was significantly down-regulated in CD8+ T cells of HBV-related ACLF patients as compared with CHB patients. Correlation analysis showed that MDSCs frequencies were positive correlated with ALT, TBIL, INR levels and MELD score.

Conclusion: Peripheral MDSCs are closely associated with disease progression in patients with HBV-related ACLF and they may serve as a possible predictor for short-term prognosis. MDSCs may suppress T-cell function through decreasing the expression of CD3 ζ-chain in CD8+T cells.