**The variations of T-lymphocytes in hepatocellular carcinoma induced by Diethylnitrosamine in SD rat model**

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BACKGROUND: Hepatocellular carcinoma (HCC) is an aggressive disease with poor prognosis and limited methods to predict patient survival. How to diagnose HCC in early stage and predict progress of HCC is urgent needed in clinic.

HYPOTHESIS: As we know, the occurrence and deterioration of tumor is highly related to individual immune system, especially cellular immunity. To investigate whether T Lymphocytes can be a potential marker to predict the occurrence of HCC, we observed the variations of ethology, liver functions and cellular immunology in SD Rat Model of HCC induced by Diethylnitrosamine (DENA).

METHODS: In DENA group (n = 60), rats were intraperitoneal administrated with 0.19% DENA (50 mg/kg) every 3 days for 12 weeks, saline of same volume was administrated in control group (n = 30). Liver tissue and blood samples were collected in 0, 4, 8, 12 and 16 weeks after DENA/saline administration. Sucrose preference test (SPT) and food consumption were applied to access rats behavior. Pathological changes of liver were examined by HE. The levels of ALT, AST, TBIL, DBIL, IBIL, $CD^{4+}$, CD8+, Th1, Th2, Th1 and Treg were compared between DENA and control group at different time points.

RESULTS: 1. The SPT and food consumption in DENA group were statistic significantly decreased in 12 weeks, compared with saline group. 2. Atypical hyperplasia and macroscopic cancer nodes started to be seen at 8 and 12 weeks in DENA rats separately. 3. The levels of ALT, AST and TBIL were statistic significantly elevated at 8 weeks after DENA administration. The levels of DBIL and IBIL in DENA group were statistic significantly increased in 12 weeks and 16 weeks separately, compared with control group. The levels of $CD4^+$ and $CD8^+$ cells in DENA group were statistic significantly increased and decreased separately in 8 weeks. The ratio of $CD4^+/CD8^+$ was statistic significantly decreased in 8, 12 and 16 weeks in DENA group. The levels of Th1 and Th17 cells were statistic significantly elevated 12 weeks after DENA injection, compared with control group. There was no statistical change in level of Th2 cells in different time point. The level of Treg cells started to show statistic significantly increase as early as 4 weeks after DENA administration, and kept elevating over time. The increased level of Treg cells can be detected much earlier than changes of liver function and other T-lymphocytes in DENA rats. What is more, these changes are even earlier than pathology diagnosis. Consequently, the Treg cell, as a sensitive marker in blood, has potential to help us diagnosing hepatocellular carcinoma in early stage.