Hepatic progenitor niche activation as histological predictor of graft survival in liver transplantation

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Background Liver damage caused by ischemia and reperfusion (IR) culminates in hepatocellular injury. IR injury negatively impacts long-term patient survival and it is a risk factor for increased severity of recurrence of hepatitis C [1]. The hepatic progenitor niche is composed of Hepatic Stellate Cells (HSCs) and Hepatic Progenitor Cells (HPCs) proliferating in liver regeneration after acute massive necrosis of hepatocytes [2].

Aims To evaluate the usefulness of HPCs and HSCs as histological predictors of graft survival in liver allografts in patients with and without hepatitis C virus (HCV) infection.

Methods Using immunohistochemistry and a semi-quantitative scoring system, HPCs (citokeratin 7 positive) and activated HSCs (alpha-smooth muscle actin positive) were identified and analysed in pre-ischemia and early post-reperfusion biopsies from transplanted livers (n=51). Features of IR injury were evaluated according to the histological Suzuki score.

Results In the reperfused graft there was an early strong expansion of HPC and activated HSC compartments. In HCV positive recipients (but not in HCV negative), HPC expansion was positively correlated with the histological grade of IR injury and associated with reduced early post-transplant graft survival; moreover, pre-ischemia and post-reperfusion HSC activation negatively correlated with the histological grade of IR injury.

Conclusions Immunohistochemical evaluation of HPCs and activated HSCs in the pre-ischemia and post-reperfusion biopsies could be a useful tool in predicting graft survival in liver transplantation in HCV patients.

References

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Key words
Hepatic Progenitor Cells; Hepatic Stellate Cells; liver transplantation; ischemia and reperfusion injury; hepatitis C virus.