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Expression of Brain Derivated Neurotrophic Factor (BDNF) and of its receptors in biliary epithelium: correlations with proliferation and apoptosis

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Cholangiocytes are the cells lining the biliary tree from canals of Hering to larger bile ducts. At morphological level, we can distinguish small and large cholangiocytes, which result heterogeneous also at functional and proliferative levels (Alpini et al., 1998). Proliferating cholangiocytes are modulated by several factors including neurotrophins (Alvaro et al., 2008). BDNF is a neurotrophin expressed in the nervous system but produced also by different types of epithelial cells and by progenitor cells of neuronal and mesenchymal origin (Prakash et al., 2010). Our aim was to investigate the expression of BDNF in the biliary epithelium.

The expression of BDNF and of its two receptors (TrkB and p75NT) was detected through immunohistochemistry and immunofluorescence in the biliary epithelium of normal and bile duct ligation (BDL) rat liver and of human cholastatic liver diseases.

BDNF and its two receptors are expressed by small, large cholangiocytes and by Hepatic Progenitor Cells (HPC), both in normal and BDL rat livers. During BDL, the expression of BDNF and of its receptors correlates with the proliferation rate of small and large cholangiocytes. Indeed, during first two weeks of BDL, BDNF, TrkB and p75NT are highly expressed and proliferation prevails on apoptosis. After three weeks of BDL, BDNF and TrkB are slightly expressed while p75NT expression remain high and apoptosis prevails on proliferation. *In vitro* studies confirmed that BDNF and its receptors are expressed by small and large rat cholangiocytes. Also in human samples BDNF and its receptors are expressed in biliary epithelium, with a different intensity during chronic cholestasis.

Our results suggest that BDNF plays a role in the remodeling of biliary tree during experimental cholestasis and cholestasic liver diseases.

References

[1] Alpini et al. (1998). Am J Physiol 274: G767-765.
[2] Alvaro et al. (2008). In: Pathophysiology of the intra-hepatic biliary epithelium 37-58.
[3] Prakash et al. (2010). Expert Rev Respir Med 4(3): 395-411.

Keywords

BDNF, neurotrophins, cholangiocytes, experimental cholestasis, neuroendocrine cells, liver diseases.