Hepatic fibrosis

Hepatic fibrosis is an **increase in the connective tissue** in the liver tissue (more precisely in the space of Disse). It is a process that precedes liver cirrhosis. Liver cirrhosis develops on average in 15-20 years [1].

Etiology

Liver fibrosis is caused by processes that lead to chronic liver damage. For example:

- chronic hepatitis (HBV, HCV, autoimmune hepatitis),
- alcohol abuse,
- schistosomiasis,
- non-alcoholic steatohepatitis (NASH),
- cholestasis and others.

The process is started by activation of hepatic stellate cells located in space of Disse. This activation is triggered by paracrine-released mediators from damaged hepatocytes, activated Kupffer cells and immune system cells (mainly growth factors TGF-β and PDGF and the cytokines IL-17, IL-22 and IL-33). Activation is associated with **the loss of vitamin A** (which they store at rest), with the **expression of smooth muscle´s actin** and their **conversion to myofibroblasts**. Activated stellate cells (myofibroblasts) subsequently **produce collagen** (especially collagen I and III) and other components of the extracellular matrix.

Reversibility

Previously, the prevailing view was that liver fibrosis is an irreversible process. However, it was found to be reversible. After removing the cause of fibrosis, some of the activated stellate cells undergo apoptosis and the rest return to a "rest state." Hepatic macrophages subsequently produce matrix metalloproteinase (MMP) enzymes, which are involved in the degradation of multiplied connective tissue.

Diagnosis

- medical imaging methods- ultrasonography, CT, MRI (all are non-specific and relatively unreliable)
- liver biopsy

Therapy

The principle of treatment is **to suppress the activation of stellate cells**. So far, there are only drugs that suppress fibrosis in vitro, but no drug that works in vivo is yet on the market. Thus, **removing the cause** of liver fibrosis still remains the most effective therapy today.

Links

Related articles

- Liver
- Stellate cells
- Liver regeneration

Source

- Seki, Ekihiro, and David A. Brenner. Recent Advancement of Molecular Mechanisms of Liver Fibrosis. *Journal of hepato-biliary-pancreatic sciences* 22.7 (2015): 512–518. PMC. Web. 13 Mar. 2017.
- Zhang CY, Yuan WG, He P, Lei JH, Wang CX. Liver fibrosis and hepatic stellate cells: Etiology, pathological hallmarks and therapeutic targets. *World J Gastroenterol* 2016; 22(48): 10512-10522
- Bataller, Ramón, and David A. Brenner. Liver Fibrosis. *Journal of Clinical Investigation* 115.2 (2005): 209–218. PMC. Web. 13 Mar. 2017.

Reference

1. [1]Bataller, Ramón, and David A. Brenner. “Liver Fibrosis.” Journal of Clinical Investigation 115.2 (2005): 209–218. PMC. Web. 13 Mar. 2017.

References

- NEČAS, Emanuel, et al. *Patologická fyziologie orgánových systémů : Část II.* 1. edition. Praha : Karolinum, 2003. 380 pp. ISBN 80-246-0674-7.