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Distribution of Heat Shock Protein-27 -70 And -90 in the Liver of Rats with Obstructive Jaundice

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BACKGROUND-AIMS

Heat shock proteins (HSPs) are a highly conserved group of proteins being expressed in various organs in response to different stress stimuli. In the present study we investigated immunohistochemically the intrahepatic expression of HSP-27, -70 and -90 in the liver of rats with obstructive jaundice, due to bile duct ligation, at different time points post-surgery.

MATERIALS AND METHODS

Forty male rats were bile duct ligated or sham operated. The animals were sacrificed at different time points post-surgery, on 3rd, 7th, 14th and 28th day. Sections of paraffin embedded liver tissue were stained immunohistochemically by the streptavidin-biotin peroxidase technique, using specific antibodies against HSP-27, -70 and -90. The intensity of staining was characterized as mild, moderate and intense.

RESULTS

Mild HSP-27 immunoreactivity was prominent as early as on the 3rd day post-bile duct ligation in periportal hepatocytes. Moderate HSP-27 expression in hepatocytes was observed on 7th and 14th day, while intense on the 28th post-surgery. Isolated ductal epithelial cells presented only mild HSP-27 immunoreactivity on the 3rd day post-bile duct ligation. Intense cytoplasmic HSP-70 immunostaining was prominent in hepatocytes on the 3rd and 7th day post-bile duct ligation in periportal hepatocytes but not in ductal epithelial cells. At further time points examined mild HSP-70 was found in isolated hepatocytes throughout the hepatic parenchyma. Moderate HSP-90 expression was observed in all hepatocytes and mild in ductal epithelial cells on the 3rd day post-surgery. Intense pattern of staining was found in periportal hepatocytes 7 days post-bile duct ligation, when ductal epithelial cells showed no HSP-90 immunoreactivity. At further time points examined, only a few hepatocytes presented mild HSP-90 immunoreactivity.

Concerning cells with stellate morphology, intense immunoreactivity for HSP-27 only, was noted on the 14th and 28th day post-surgery. Nuclear pattern of staining was never observed in any of HSPs examined. In sham operated rats, sacrificed at the same time points, a few hepatocytes, less than 2%, were positive for HSP-90 in centrilobular area, while HSP-27 and -70 were not expressed.

CONCLUSIONS

Our data describe the differential distribution of HSP-27, -70 and -90 in the liver of rats with obstructive jaundice due to bile duct ligation, supporting evidence that these proteins participate differently in injury and regeneration as it has also been shown in other models of liver damage.