Beneficial Effect of Hyperbaric Oxygenation on Liver Renegeneration in Cirrhosis

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Summary
Underlying hepatic injury and cirrhosis are leading factors that interfere with the post-operative liver regeneration and function. Hyperbaric oxygenation (HBO) has been reported to ameliorate the ischemia-reperfusion injury of the liver, to induce compensatory hypertrophy of the predicted remnant liver in rats after portal vein ligation and to augment liver regeneration after hepatectomy in non-cirrhotic rats.

The study aim was to determine the effect of HBO treatment on liver regeneration after partial hepatectomy in normal and cirrhotic mice in this experimental study.

Materials and Methods
The effect of HBO on liver regeneration was studied in a mice model combining carbon tetrachloride induced cirrhosis and partial hepatectomy. Mice were divided into four groups: Control, cirrhotic, non-cirrhotic HBO-treated, and cirrhotic HBO-treated. All animals underwent 40% hepatectomy. Liver regeneration was evaluated by the proliferating cell nuclear antigen-labeling index. Serum aspartate aminotransferase and alanine aminotransferase levels were measured to evaluate liver injury.

Results
Serum alanine aminotransferase and aspartate aminotransferase levels were significantly decreased in HBO-treated cirrhotic group compared to cirrhosis group after hepatectomy (P = 0.001 and P = 0.014, respectively). The proliferating cell nuclear antigen labeling index was significantly higher in HBO treated cirrhotic group than in cirrhotic group after hepatectomy (P = 0.022).

Conclusions
Our results suggest that HBO treatment improves liver functions and augments hepatocyte regeneration in cirrhotic mice after hepatectomy. Post-operative HBO treatment may have a beneficial effect on post-operative liver function and regeneration in cirrhotic patients.