

## Liver cirrhosis – Epidemiological and Clinical Aspects

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### Abstract

Liver cirrhosis is the end-stage of many different chronic liver diseases. Limited data exists on the epidemiology, natural history and complications of liver cirrhosis such as esophageal varices and malignancies in the Nordic countries after the discovery of hepatitis C (HCV). Most hepatocellular carcinomas (HCC) develop in patients with liver cirrhosis but data on the occurrence of other malignancies than HCCs in these patients are scarce. Gastrointestinal (GI) symptoms such as nausea, vomiting, abdominal pain, and diarrhea are common in patients with advanced liver disease but the importance of portal hypertension for these symptoms is unexplored.

The aims of the present study were to evaluate the incidence, outcome and complications of liver cirrhosis in a Swedish population and in Iceland and the effects of portal hypertension on small bowel motility and small intestinal bacterial overgrowth (SIBO) in patients with liver cirrhosis.

The annual incidence of liver cirrhosis in Gothenburg was  $15.3 \pm 2.4/100.000$  compared to  $3.3 \pm 1.2/100.000$  in Iceland,  $p < 0.0001$ . In Gothenburg 50% of the patients had alcoholic cirrhosis compared to 29% in Iceland ( $p < 0.0001$ ).

Of the patients diagnosed with esophageal varices after a bleeding episode, 55% had a bleeding episode during follow-up compared to only 13% of the patients diagnosed without a bleeding episode. Variables predicting mortality in a multivariate analysis were: Child-Pugh class, bleeding before diagnosis, age and bilirubin levels. Causes of death were in 26% of cases liver failure, 19% variceal bleeding and the rest other causes.

Patients with liver cirrhosis have 267 times increased risk of hepatocellular cancer, of patients with HCV cirrhosis 19% developed HCC and 20% of those with HCV and alcoholic liver disease (ALD). We observed 13 times increased risk of cholangiocarcinoma and also increased risk for esophageal, pancreatic, pulmonary and colorectal cancer than in the general population.

Patients with liver cirrhosis and portal hypertension had more motility disturbances in the small intestine compared to those without portal hypertension and seemed to have a higher risk of small intestinal bacterial overgrowth.

**Conclusions:** The incidence of liver cirrhosis is low in Iceland, 24% of the incidence in Gothenburg. The difference is due to lower incidence of alcoholic liver disease and HCV cirrhosis in Iceland. In patients with liver cirrhosis and esophageal varices a bleeding is still a strong risk factor for recurrent bleeding. The mortality is high but mainly from other causes than variceal bleeding and few die in the first bleeding. The risk of HCC in cirrhosis is mostly associated with HCV and is the same in HCV patients with and without alcohol. Other malignancies than HCC are more common in patients with cirrhosis than in the general population. Abnormal small bowel motility and SIBO is common in patients with liver cirrhosis with concomitant portal hypertension. Portal hypertension *per se* might be significantly related to small bowel abnormalities observed in patients with liver cirrhosis.

**Keywords:** Liver cirrhosis, etiology, alcoholic liver disease, mortality, portal hypertension, esophageal varices, variceal bleeding, hepatitis C, hepatocellular cancer, malignancies, small intestinal motility, small intestinal bacterial overgrowth.

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Liver cirrhosis in Iceland and Sweden: incidence, etiology and outcomes.  
*In manuscript*
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*In manuscript*
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