The impact of geographical region on outcomes of patients with primary biliary cholangitis from western Europe

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Background and Aims: Although the incidence and prevalence rates of primary biliary cholangitis (PBC) vary according to geographical region, the disease affects people from all geographical regions. It is unknown whether regions with a higher prevalence for PBC, such as Northern Europe, have distinct disease characteristics or outcomes. The aim of this study was to determine whether geographical region contributes to differences in outcomes of patients with PBC within Western Europe.

Method: Patients from the Global PBC database from European centers diagnosed from 1990 onwards that were ursodeoxycholic-acid (UDCA) treated were included in the study. Patients with a time lag greater than 1 year from diagnosis to the start of follow-up were excluded. Differences in baseline characteristics and outcomes (transplant-free survival and decompensation) were studied. The impact of geographical region was studied according to North/South and East/West, as well as longitude and latitude.

Results: A total of 1878 patients were included in the study. Patients in North Europe were more often of a moderately advanced or advanced Rotterdam biochemical stage (28.4%) compared to those in South Europe (20.6%). Additionally, they exhibited higher median alkaline phosphatase (ALP [2.0×ULN vs. 1.4×ULN]) and transaminases (AST: 1.4×ULN vs. 1.3×ULN; ALT: 1.7×ULN vs. 1.4×ULN). Similarly, West Europe also presented with higher ALP and transaminases. North Europe, as compared to South Europe, was associated with lower transplant-free survival and higher decompensation rates, with 15-year survival rates of 66% vs 79% (P=0.001) and decompensation incidence of 21% vs 10% (P<0.001). The association of geographical region with outcome was assessed with longitude and latitude in multivariable analysis while adjusting for biochemical markers of disease severity and cirrhosis as a time-dependent covariate, as well as age, sex, and diagnosis

year. There was a significant interaction between latitude and longitude in the prediction of transplant-free survival ($P=0.001$) and decompensation ($P<0.001$). An increased risk for poor outcomes was observed for the Northwestern area of the evaluated region compared to the reference (Paris) (**Figure**).

Conclusion: Patients from Northwestern Europe with PBC and of similar disease severity have increased risk of decompensation and liver transplantation or death. This suggests that in the Northwestern part of Europe, geographical region may have an impact on patient outcome.

Figure:

A) Hepatic decompensation

B) Liver transplantation or death