Coronary artery disease in liver cirrhosis: Does the aetiology of liver disease matter?

To the Editor:

We read with great interest the paper by Kadayifci et al. [1] regarding the prevalence of coronary artery disease (CAD) and risk factors for atherosclerosis in liver cirrhosis. The authors reviewed retrospectively the patient notes of 60 subjects with non-alcoholic steatohepatitis (NASH)-related cirrhosis and 60 age- and sex-matched controls with cirrhosis of other aetiologies who underwent liver transplantation. The two groups were compared regarding the prevalence of CAD and that of risk factors for atherosclerosis. The prevalence of CAD was found to be higher in NASH-cirrhosis than in cirrhosis due to other aetiologies (21.6% vs. 3.3%, \( p < 0.05 \)). Also, patients with NASH-cirrhosis were found to have higher prevalence of arterial hypertension (51.6% vs. 20%), diabetes mellitus (65% vs. 31.6%), obesity (28.3% vs. 6.6%), and the metabolic syndrome (48.3% vs. 10%) compared to those with cirrhosis of other aetiologies (\( p < 0.05 \) for all). The two groups did not differ significantly in smoking habits or the presence of atherosclerosis in hepatic arteries of explanted livers [1]. The authors concluded that CAD and major risk factors for atherosclerosis are significantly more prevalent in subjects with NASH-cirrhosis compared to cirrhosis of other aetiologies.

The prevalence of CAD has been considered to be low among patients with liver cirrhosis compared to the general population. This notion is based mainly on autopsy studies since the 1960s and 1970s [2,3] as well as on studies from the South of Europe in which the majority of included patients had cirrhosis due to hepatitis C [4,5]. Although no formal comparison with a control population was performed, the study of Kadayifci et al. suggests that patients with NASH-cirrhosis do not have a low prevalence of CAD. However, the most common cause of cirrhosis in Western countries is alcoholic liver disease (ALD) and, unfortunately, no patients with ALD-cirrhosis were included in the study by Kadayifci et al. [1]. Comparative data on the prevalence of CAD and its risk factors in patients with cirrhosis of different aetiologies are largely lacking.

We recently conducted a prospective study on the prevalence of CAD and its risk factors in 127 consecutive patients with liver cirrhosis compared to a sample of subjects from the general population (\( n = 203 \)) [6]. A total of 55/127 patients (43%) had ALD-cirrhosis, 22 (17%) had NASH (or cryptogenic) cirrhosis, and 50 (40%) had cirrhosis of other aetiologies. CAD was found to be more common in cirrhotic patients compared to controls (20% vs. 12%, \( p = 0.001 \)). In regression analysis, CAD was independently related to diabetes (odds ratio (OR) 5.47, 95% confidence interval (CI) 2.44–12.28), but not to liver cirrhosis. In the liver cirrhosis group only ALD-cirrhosis (OR 9.5, 95% CI 1.08–83.4) and age (OR 1.23 per year, 95% CI 1.06–1.43) were independently related to CAD [2]. In this study, although ALD-cirrhosis was more common among cirrhotic patients with CAD than in those without CAD (65% vs. 38%, \( p = 0.01 \)), the prevalence of NASH-cirrhosis did not differ significantly between the two groups (23% vs. 16%, \( p > 0.05 \)) and, thus, the latter was not entered in the regression analysis [6].

We have now stratified our cohort according to etiology of liver cirrhosis, thus dividing it into three groups: the ALD-cirrhosis group (\( n = 55 \)), the NASH-cirrhosis group (\( n = 22 \)), and the groups of cirrhosis due to other aetiologies (\( n = 50 \)). The prevalence of CAD did not differ significantly between NASH- and ALD-cirrhosis but was lower in cirrhosis of other aetiologies compared to both groups (\( p < 0.05 \) (Fig. 1). The prevalence of CAD risk factors is shown in Table 1. Patients with NASH-cirrhosis were older and had diabetes and history of arterial hypertension more often than patients...
in the other two cirrhosis groups ($p < 0.05$). ALD-cirrhotic patients were more often male and smokers than patients in the other two groups ($p < 0.05$). The three cirrhosis groups did not differ significantly in the prevalence of obesity, hereditary predisposition to CAD, cirrhosis complications or severity, or serum cholesterol ($p > 0.05$ for all). In multivariate analysis, CAD was found to be independently related to age (OR 1.1 per yr, 95% CI 1.04–1.2), ALD-cirrhosis (3.5, 95% CI 1.2–10.1), and history of arterial hypertension (2.9, 95% CI 1.04–8.2).

Taken together, the findings of Kadayifci et al. [1] and our results indicate that the prevalence of CAD is higher in ALD- and NASH-cirrhosis compared to cirrhosis of other aetiologies. Both studies show that CAD risk factors are more common in NASH-cirrhosis than in cirrhosis of other aetiologies. These results suggest that a more rigorous work-up for the diagnosis of CAD may be indicated in patients with ALD- and NASH-cirrhosis.

References


Evangelos Kalaitzakis *
Einar Björnsson
Section of Gastroenterology and Hepatology,
Department of Internal Medicine,
Sahlgrenska University Hospital,
413 45 Gothenburg, Sweden
*Tel.: +46 31 3421000; fax: +46 31 822152.
E-mail addresses: evangelos.kalaitzakis@vgregion.se, kalvag@hotmail.com (E. Kalaitzakis)
doi:10.1016/j.jhep.2009.06.012

Coronary artery disease in NASH-related cirrhosis

To the Editor:

We thank Drs. Kalaitzakis and Björnsson [1] for their interest in our paper [2] and for providing their data that supports our observation of a high prevalence of coronary artery disease in patients with cirrhosis from non-alcoholic steatohepatitis (NASH) compared to those

![Fig. 1. The prevalence of coronary artery disease in patients with ALD-cirrhosis, NASH-cirrhosis, and in those with cirrhosis of other etiologies. The $p$-value of chi-square test for all three groups is reported. ALD, alcoholic liver disease; NASH, non-alcoholic steatohepatitis.](image-url)