

High-density lipoprotein response to alcohol consumption and abstinence as an indicator of liver function in alcoholic patients

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A study of 36 alcoholic men admitted to hospital when intoxicated was undertaken to confirm the value of changes in the level of high-density lipoprotein cholesterol (HDL) as an indicator of liver function in patients with chronic alcoholism. In the patients without severe liver disease the HDL level was high after the recent consumption of alcohol and usually dropped by 0.2 mmol/L or more after 1 or 2 weeks of abstinence. In contrast, in the patients with severe alcoholic liver disease the HDL level was initially low and generally remained low after abstinence.

Une étude chez 36 hommes alcooliques hospitalisés alors qu'ils étaient en état d'ivresse a été entreprise afin de vérifier si les changements du niveau du cholestérol à lipoprotéines de haute densité (LHD) peuvent servir d'indicateur de la fonction hépatique chez les patients souffrant d'alcoolisme chronique. Chez les patients sans atteinte hépatique grave le niveau du LHD était élevé après consommation récente d'alcool et baissait habituellement de 0,2 mmol/L ou plus après 1 ou 2 semaines d'abstinence. À l'opposé, chez les patients avec atteinte hépatique alcoolique grave le niveau du LHD était initialement bas et en général demeurait bas après abstinence.

The level of high-density lipoprotein cholesterol (HDL) has been consistently shown to be positively associated with alcohol consumption:¹⁻⁵ the level rises with alcohol consumption but tends to fall to control values after 1 or 2 weeks of abstinence. This relation also holds true in people with chronic alcoholism⁶⁻⁹ as long as their liver function remains relatively intact. However, severe alcoholic liver disease prevents the response.¹⁰⁻¹⁴

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The present study was designed to confirm the value of changes in the HDL level as an indicator of liver function in patients with chronic alcoholism. We hypothesized that alcoholic patients who had high HDL levels while drinking and lower levels after abstinence would have relatively intact liver function, whereas those with low levels both before and after abstinence would have severe liver damage.

Methods

Thirty-six men with chronic alcoholism (mean age 48 years) were included in this study. Chronic alcoholism was defined as an estimated daily ethanol consumption of more than 160 g during the previous 5 years. All 36 patients were intoxicated when admitted to hospital (mean blood alcohol level 61 mmol/L). Patients with any coincidental major illness other than liver disease or evidence of intake of substances other than ethanol were excluded from the study.

Within 24 hours after admission and after the patients had fasted for 12 hours the HDL level was determined by the heparin-manganese precipitation method,¹⁵ and the concentration of cholesterol in the supernatant was measured enzymatically. The HDL level was again determined after 8 to 14 days of in-hospital abstinence. The control HDL level was 1.2 mmol/L, which was based on the results of testing 101 age-matched, apparently healthy, nonalcoholic male staff members of the clinical institute.

All the patients had a percutaneous liver biopsy, for which informed consent was obtained. The specimens were classified according to pathological criteria previously described.¹³ Seventeen patients, in whom either the histologic findings were normal or else fatty infiltration of the liver was the sole abnormality, were classified as being without severe liver disease; the other 19 patients, who had cirrhosis or alcoholic hepatitis, or both, were classified as having severe liver disease.

As part of the initial assessment the "combined clinical and laboratory index" (CCLI) was calculated for all the patients. Scores in the index range between 0 (no damage) and 25 (maximal damage). The CCLI has been validated as an indicator of the severity of liver disease.^{16,17}

Results

The initial HDL level was statistically significantly higher ($p < 0.0001$) in the patients without severe liver disease than in those with severe liver disease (t -test). The changes in the level after 8 to 14 days of in-hospital abstinence are shown in Fig. 1. Among the patients without severe liver disease the level dropped by more than 0.2 mmol/L in all but three, but among the patients with severe liver disease there was generally no change in the level, and in a few patients the level even increased.

However, two patients in the latter group had high levels of HDL initially and lower levels after abstinence.

In the total group of 36 patients there was a negative correlation between the CCLI and the HDL level ($r = -0.5, p < 0.002$).

Discussion

Our study focused on the simple quantitative response of HDL to alcohol consumption in the presence or absence of severe liver disease. We did not address the issue of altered composition of HDL by liver injury,^{10,11} nor did we intend to introduce a new, clinically applicable "liver function test".

Our observations suggest that "active drinking" (i.e., recent alcohol intake) has the greatest impact on the HDL level in alcoholic patients, depending on the status of the liver. In our patients a high HDL level (1.5 mmol/L or greater) during active drinking, together with a fall of 0.2 mmol/L or more in the level after 1 or

2 weeks of abstinence, indicated that severe liver damage was improbable. On the other hand, an HDL level of less than 1.5 mmol/L in the presence of a high blood alcohol level suggested the possibility of severe liver disease, and a level of less than 1.1 mmol/L indicated that severe liver disease was probable.

The most reliable way of making or ruling out a diagnosis of alcoholic liver disease is by liver biopsy; most clinical and biochemical criteria correlate poorly with histologic findings.¹⁸ However, when biopsy is unavailable or cannot be done, the response of HDL to alcohol consumption and abstinence may be used as an indicator of liver function in patients with chronic alcoholism, although further study of this response is needed.

The editorial assistance of Joyce L. Zaborski is gratefully acknowledged.

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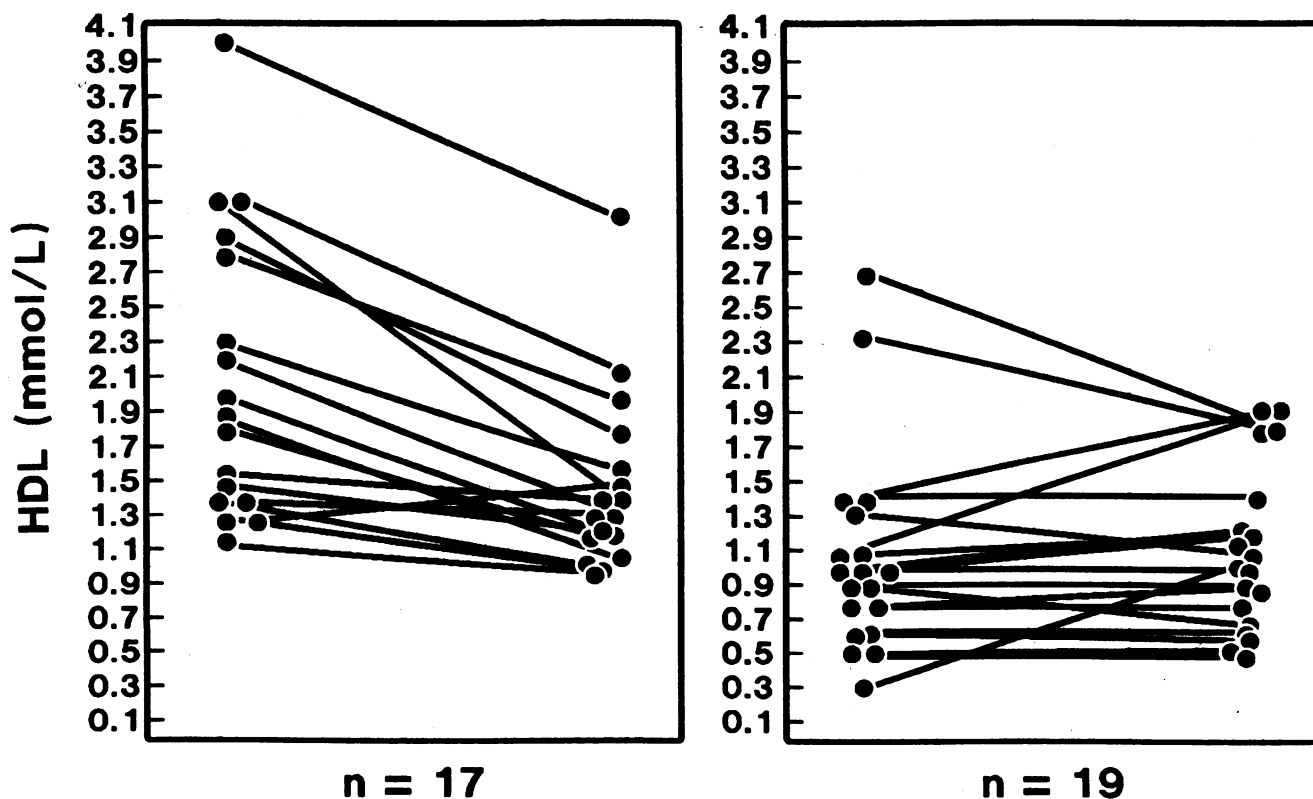


Fig. 1—Changes in high-density lipoprotein (HDL) level after 8 to 14 days of in-hospital abstinence in alcoholic patients without (left) or with (right) severe liver disease.

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