The paper of Bette Liu et al. [1] reports a large prospective cohort study of 1,230,662 middle aged women without liver disease before recruitment and followed for an average of 6.2 years, from 1996 to 2001. The aim of this study was to examine the relation between body mass index (BMI) and the incidence of hospital admissions with liver cirrhosis and deaths from liver cirrhosis and whether the relation was modified by alcohol or by other factors.

The main findings are the following:

- first compared with the reference group (women with a BMI of 22.5 to less than 25) relative risks for hospital admission with cirrhosis or deaths from cirrhosis increased with BMI and adjustment for alcohol consumption, age, region, socioeconomic status, smoking and physical activity did not alter the pattern of risk substantially. Among these women the estimated increase in the risk of cirrhosis was 28% for each five units increase in BMI. Presence of diabetes and smoking were risk factors of hospital admissions with liver cirrhosis and deaths from liver cirrhosis but there was respectively no or little trend of increasing risk with increasing BMI;
- second absolute risk increase in liver cirrhosis rates with increasing BMI was substantially greater in women who reported that they drank 150 g or more of alcohol per week (mean intake 2.5 drinks per day). In these women, the absolute risk of liver cirrhosis per 1000 women over 5 years was 2.7 (2.1 to 3.4) for those with a BMI between 22.5 and 25 and 5 (3.8 to 6.6) among the women with a BMI of 30 or more (Fig. 1).

This study is subject to a number of limitations. Hospital admission data were used for identifying liver cirrhosis. Thus, this study assesses the risk for hospital admission with cirrhosis or deaths from cirrhosis and not the risk of cirrhosis. These patients had probably complicated cirrhosis. Thus frequency of cirrhosis is undoubtedly underestimated. Cirrhotic patients often do not come to medical attention until late in the clinical course when liver complications develop. Patients with asymptomatic cirrhosis probably are not taken in account. The follow-up of 6.2 person's years is short for such pathology. Finally no data were given about viral hepatitis C and is important to know whether the effect of BMI and alcohol on cirrhosis is modified by this factor.

One another weakness of this study was the absence of data about the regional distribution of adipose tissue. Obesity appears to be a risk factor for cirrhosis-related death or hospitalization in the general population but recent findings have shown that distribution of body fat may be at least as important as total adipose mass in the development of non alcoholic fatty liver disease and central adiposity can be an independent predictor of hepatic steatosis [2]. Ruhl and Everhart using data from the third national health and
Figure 1  Standardised rates (with 95% CI) for liver cirrhosis per 1000 women over 5 years by body mass index and alcohol consumption. Rate plotted against mean measured body mass index in each body mass index category (see methods).

nutrition examination survey (NHANES III) have reported that waist-to-hip circumference ratio was more strongly associated with elevated ALAT concentration that BMI [3]. In a cross-sectional study on 1442 obese women we found trunk fat mass is positively and independently correlated with liver enzyme levels [4].

Nevertheless the results on the relation between BMI and liver cirrhosis in women drinking 150 g or more of alcohol per week are broadly consistent with those of our previous studies. Effectively we reported that the presence of excess weight for at least 10 years in heavy drinkers (at least 50 g of alcohol per day over the previous year) was an independent risk factor for cirrhosis [5]. Then we have also shown that BMI was an independent risk factor for fibrosis in alcoholic patients [6]. Several mechanisms could explain the association between BMI and cirrhosis in drinkers. In alcoholic patients, overweight could increase the presentation of free fatty acids (FFA) to the liver and FFA are highly reactive and can damage biological membranes [7]. Recently we have demonstrated that patients with alcohol liver disease display inflammation not only in the liver, but also in the adipose tissue [8]. The production of TNF-α and IL-10 by the adipose tissue was correlated with histological liver lesions. These findings should account for the harmful interactions between BMI and alcohol in obese women drinking 150 g or more of alcohol per week.

These findings have important clinical and public health implications. Health education is needed to highlight the combined risk of BMI and alcohol greater than 150 g per week on liver disease and to prevent a more rapid increase than predicted from effects of each factor separately.

Conflict of interest

The author has no conflict of interest.

References