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1. Introduction

Alcoholic liver disease occurs after prolonged heavy drinking, particularly among persons who are physically dependent on alcohol. Alcoholic liver disease is pathologically classified into three forms: fatty liver (hepatic steatosis), alcoholic hepatitis, and cirrhosis. There is considerable overlap among these conditions. The incidence of alcoholic liver disease increases in a dose-dependent manner proportionally to the cumulative alcoholic intake. Alcoholism is increasing among females, owing to a decline in the social stigma attached to drinking and to the ready availability of alcohol in supermarkets. In general, however, males have a greater opportunity for drinking. In the United States, the National Comorbidity Survey estimated that, at some time in their lives, 6.4% of females and 12.5% of males will meet the criteria for alcoholic abuse (Kessler et al., 1994). The Italian longitudinal study on aging showed that 42% of elderly females and 12% of elderly males were lifelong abstainers (Buja et al., 2010). In Japan, based on data from the National Nutrition Survey, heavy drinkers with a daily consumption exceeded 40 g of ethanol per day for females and 60 g of ethanol per day for males were more frequently observed in males (Figure 1). Despite the male predominance for alcoholism, chronic alcohol consumption induces more rapid and more severe liver injury in females than males.

In contrast, the progression of hepatic fibrosis in chronic hepatitis B and C appears to be slower in females than in males (Poynard et al., 1997; Poynard et al., 2003; Rodriguez-Torres et al., 2006; Wright et al., 2003). Hepatic fibrosis is fibrous scarring of the liver in which excessive collagens build up along with the duration and extent of persistence of liver injury. In other words, overproduced collagens are deposited in injured areas instead of destroyed hepatocytes. Moreover, females, especially before menopause, produce antibodies against hepatitis B virus (HBV) surface antigen (HBsAg) and HBV e antigen (HBeAg) at higher frequency than males (Furusyo et al., 1999; Zacharakis et al., 2005). In chronic infection with hepatitis C virus (HCV), the clearance rate of blood HCV RNA appears to be higher in females (Bakr et al., 2006). Most asymptomatic carriers of HCV with persistent normal alanine aminotransferase (ALT) are females and have a good prognosis with a low risk of progression of hepatic fibrosis to the end-stage cirrhosis and its complications such as hepatocellular carcinoma (HCC) (Gholson et al., 1997; Puoti et al., 2002). The menopause is associated with accelerated progression of hepatic fibrosis, and the HCC risk is inversely related to the age at natural menopause (Shimizu, 2003; Shimizu et al., 2007a).
The “female paradox” observed in patients with alcoholic liver disease in comparison with chronic viral hepatitis is based on susceptibility by females to liver damage from smaller quantities of ethanol.

2. Alcoholic liver disease in females

The amount of alcohol required producing hepatitis or cirrhosis varies among individuals, but as little as 40 g/day (Table 1) for 10 years is associated with an increased incidence of cirrhosis. There is considerable evidence to suggest that females require less total alcohol consumption (20 g ethanol/day) to produce clinically significant liver disease. Indeed, it is reported that the lowest point of weekly alcohol intake that helps to develop liver disease was higher in males (168-324 g) than in females (84-156 g), and that, in the case of heavy drinkers with a weekly consumption of 336-492 g, the relative risk for alcoholic liver disease was 3.7 in males and 7.3 in females, while it was 1.0 in the group with a weekly consumption of 12-72 g (Becker et al., 1996). Thus, safe drinking guidelines recommend that females do not drink more than 20 g ethanol per day, and males not more than 40 g ethanol. A common, reasonable recommendation is not to exceed 70 g of ethanol a week.

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<td>Beer</td>
<td>500 ml</td>
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Table 1. Alcohol (ethanol) equivalents.

The incidence of alcoholic liver disease correlates with the national per capita consumption of ethanol derived from sales of beer, wine and spirits (Figure 2). For instance, in France, the
Gender Difference in Alcoholic Liver Disease


Alcoholic liver disease occurs after prolonged heavy drinking. Not everyone who drinks alcohol in excess develops serious forms of alcoholic liver disease. It is likely that genetic factors determine this individual susceptibility, and a family history of chronic liver disease may indicate a higher risk. Other factors include being overweight and iron overload. This book presents state-of-the-art information summarizing the current understanding of a range of alcoholic liver diseases. It is hoped that the target readers - hepatologists, clinicians, researchers and academicians - will be afforded new ideas and exposed to subjects well beyond their own scientific disciplines. Additionally, students and those who wish to increase their knowledge will find this book a valuable source of information.

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