

Alcoholic Liver Disease: Connection with Binge Drinking

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Abstract

Review Article

Alcohol abuse is dangerous to human health especially it affects our liver and form alcoholic liver disease (ALD). In United States, latest reports of National Institute on Alcohol Abuse and Alcoholism showed that liver cirrhosis is the 12th primary cause of death. Many studies imparted that there is a connection with patterns of drinking and ALD progression. Nowadays consumption pattern of alcohol have changed and binge drinking become common one. This review mainly focused on patterns of drinking and their relations to ALD especially binge drinking.

Keywords: Alcoholic liver disease, drinking patterns, Binge drinking, World Health Organization, Risk factors.

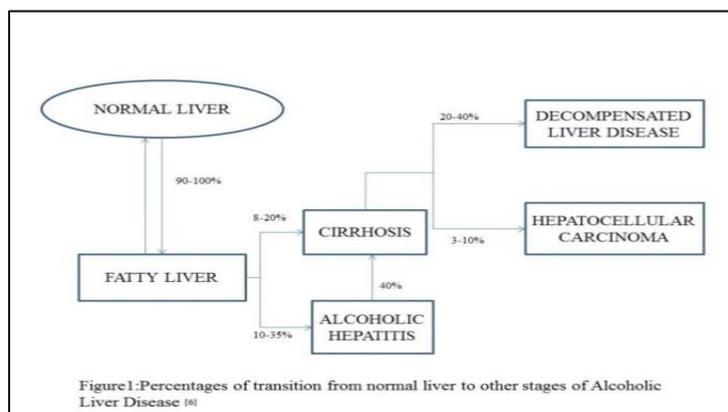
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INTRODUCTION

In worldwide, one of the important predisposing factors for chronic disease is alcohol intake [1]. This is also a leading cause of preventable morbidity and mortality especially in Western countries. World Health Organization (WHO) reports reveal that 4.5% of the diseases and 4% of the deaths occurs in the world as a result of alcohol use. In Eastern Europe countries alcohol is considered the main cause of death among men between 15 and 59 years of age [2-3]. Alcohol-related deaths account for up to 48% of liver cirrhosis deaths in United States [4]. Lieber *et al.* conducted a study in 1960s and reveals that ALD is not simply caused by malnutrition. It is mainly because of hepatocellular damage triggered by a true hepatotoxin-alcohol [5].

Spectrum of Alcoholic Liver Disease

The spectrum of alcoholic liver disease differs from simple steatosis to cirrhosis. The different types of alcohol related liver injury are fatty liver, alcohol connected hepatitis (AH), liver cirrhosis and hepatocellular carcinoma (HCC). Fatty liver occurs in 90% of heavy drinkers and it is initial responses to alcohol consumption. Peoples who drink small quantity also have chances for fatty liver. Advanced alcohol related fibrosis and cirrhosis result only in 30% of heavy drinkers. In patients with previous ALD and heavy alcohol intake, shows episodes of Alcoholic hepatitis (AH). In serious cases and in patients with liver cirrhosis, alcoholic hepatitis leads to high short-term mortality complications like liver failure and portal hypertension [6]. Hepatitis virus B or C, HIV infection and non-alcoholic fatty liver disease have synergistic effects with long term alcohol use. Progression of liver fibrosis, cirrhosis, and hepatocellular carcinoma (HCC) occurs through multiple mechanisms when patients with viral hepatitis consume alcohol [7-8].



Drinking patterns of Alcohol

The main two patterns of “Alcohol drinking” are acute “binge drinking” and “chronic drinking”. There is a difference in metabolic effects of these two types of drinking patterns. For example, development of alcoholic liver damages results from chronic drinking whereas glycogen depletion, acidosis and hypoglycaemia results from binge drinking [9]. Chronic drinking means heavy Alcohol use. According to Substance Abuse and Mental Health Services Administration (SAMHSA), heavy alcohol use is 5 or more day’s binge drinking in the past month [10]. Progress of advanced ALD is mainly depending on quantity of alcohol intake. There is a close relation connecting the quantity of alcohol consumed (>30 g/day in most studies) and the chances of developing ALD [11]. One large study conducted in Europe, they enrolling patients with different stages of ALD. During follow-up they realize that an intake of 400 g ethanol/week strongly increased the risk of developing cirrhosis (30%) [12]. Alcoholic liver disease progression not only depends on amount of alcohol intake but also the type of alcohol drinking. Best example is red wine drinkers; they show a small risk of cirrhosis than consumers of other alcoholic beverages [13-14]. Beside above connection, increased risk of cirrhosis is common in patients who drink alcohol outside of meals [15]. Similar results was obtained from study conducted in china and they shows 2.7-fold increase in risk of ALD in patients who drinking outside of meal times than those who consumed alcohol only at mealtimes[16].

Binge drinking

Definition- According to World Health Organization (WHO) binge drinking is a pattern of heavy drinking for a long period [17]. Binge drinking definition in different countries study shows different. For example, consumption of more than eight drinks in men and more than six drinks in women in a single day is considered as binge drinking in United Kingdom [18]. In the United States, when drinking brings blood alcohol level to 0.08 gram-percent or above is considered as binge drinking and the amount of alcohol that has to be consumed to reach these blood alcohol levels for an adult is equivalent to drinking five or more drinks in men or four or more drinks in women within two hours. The Substance Abuse and Mental Health Services Administration (SAMHSA) conducted an annual National Survey and reveals that binge drinking happened when there is chance for 5 or more drinks for males or 4 or more drinks for females on the same occasion on at least 1 day in the past month [10]. An additional and more adequate definition for the clinical environment is consumption of six or more drinks by men (60 g) and five or more drinks by women (50 g) within 2 hour at least once in the last 30 days [19].

Growing evidence supports that harmful effects in humans and rodents occurs from quick intake of alcohol. Binge drinking usually leads to increase in serum lipopolysaccharide (LPS) levels, it is leading mediator of Alcoholic liver disease [20-21]. Nitric oxide metabolites also have similar effects in ALD [22]. Some studies provide an information that an interconnection among activation of CYP2E1-HIF-1 α -dependent apoptosis pathway and binge drinking [23].

Risk factors

There are different risk factors associated with binge drinking. In which age and gender are important factors other factors also contribute binge drinking. A study about risk factors related to binge pattern conducted in Italy in 654 individuals. Through an analysis they observed there is relation between binge consumption and education level, money available to use during weekends, interest of peoples to participate in celebrations and night club, cannabis use, electronics cigarettes use and higher impact of friends. They also reveals living with family members is a good factor to avoid binge drinking [25].

Age: Different Study conducted both in the United States and United Kingdom, conveys that the prevalence of binge drinking decreases with age. This indicating that the binge drinking is major problem specifically in young people [10]. Binge drinking in young people is not only a risk factor for alcohol abuse but also risk for developing ALD [25].

Female gender: Binge drinking is more common than chronic pattern especially younger women and it results in deleterious effects from alcohol. Some experiments conducted in animal models and propose that female hormones may provide to high levels of binge drinking[26]. These results are compatible with previous studies showing that alcohol intake reduced by depleting circulating female hormones[27].

Connection with alcoholic liver disease

Ruhl *et al.* in 2005 conducted a cohort study in 13580 adult participants that gives valuable information about the binge drinking pattern. There is elevation in aminotransferase levels particularly in obese patients drinking 1-2 drinks per day [28]. Another cohort study in 2015 also shows binge drinking results in hepatic steatosis especially in men with overweight or obesity [29]. Researchers at the University of California, San Francisco (UCSF) conducted a study in mice to see the effects of binge drinking. They reveal that relatively limited binge drinking can also show disordering of liver function and development of ALD [30]. Åberg *et al.* conducted an epidemiological study and it deliver evidence of binge drinking results in more severe forms of ALD, sometimes it lead to hospitalization [31].

CONCLUSION

Alcohol related liver disease is a serious disorder and lead to early death. From different studies, we can conclude that, there is a relation between ALD and patterns of drinking. In which binge drinking is important risk factor for ALD. Binge drinking pattern is more common in teenagers and young adults. This pattern of consumption produces deleterious effects in females than males. To avoid alcohol related liver disease, we have to conduct some public awareness programmes especially in younger population.

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