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Review Article

Impact of alcohol on liver disease

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ABSTRACT

Alcoholic liver disease (ALD) develops in patients consuming excessive quantities of alcohol which result in fatty liver, alcoholic hepatitis, and chronic hepatitis with liver fibrosis or cirrhosis. Alcohol related health issues are at the forefront of the medical agenda now a day's, as alcohol related liver disease and mortality rate keeps on increasing. To enhance the quality of life, the optimal approach to the reduction of alcoholic liver disease should focus on early identification and an effective intervention.

Keywords: ALD.

INTRODUCTION:

Alcoholic liver disease refers the condition of chronic alcohol excess which is associated with liver damage, including, steatosis, alcoholic hepatitis, chronic hepatitis, fibrosis and cirrhosis (1). Globally, in 2010 alcohol related cirrhosis was the identified cause of 493300 deaths and 1454000 disability adjusted life, representing 0.9% of all global deaths and 0.6% of all global disability adjusted life (2). The first published insights into the effects of alcohol on health were made in 1920 and published in the British Medical Journal in 1924, showing a lower life expectancy in heavy drinkers than in abstainer's or moderate consumers of alcohol (3). Similar observations were noted when United States, restricted on the supply of alcohol, mortality rate significantly decrease due to cirrhosis. During World War II France rationalized alcohol supply where about 80% of deaths from cirrhosis were reduced. Several studies throughout the decades have demonstrated that heavy alcohol consumption is associated with mortality and more specifically cirrhosis (4-5). Chronic alcohol excess is associated with a range of different patterns of liver damage, including: simple steatosis, alcoholic hepatitis, fibrosis, and cirrhosis.

Impact of alcohol metabolism

Alcohol is metabolized to acetaldehyde, a toxic compound that normally converted to acetate which further transported in the blood. Alcohol is metabolized by alcohol dehydrogenase (ADH) which is predominantly found in hepatocytes and few concentrations in stomach. Two other enzyme systems also metabolize alcohol; the microsomal ethanol oxidizing (MEOS) system and catalase. The microsomal ethanol oxidizing system involves the cytochrome P450 enzyme system, particularly CYP2E1. Metabolism of alcohol through MEOS pathways produces free radicals and oxidative stress, contributing to the development of hepatic inflammation and damage (6).

Alcoholic Steatosis

The presence of fat within the liver (steatosis) is the most common form of liver disease related to alcohol seen in the majority of heavy drinkers. Fatty liver is estimated to occur in at least 90% of those regularly consuming more than 60g/day of alcohol (7). The synthesis of fat increases to be multifactorial, as alcohol facilitate to increase fatty acid synthesis , increases mobilization of fatty acids from adipose tissue, reduce fatty acid oxidation, and

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impair very low density lipoprotein export. (8) Alcohol can even induce a micro-vesicular steatosis with multiple smaller lipid droplets accumulating within the hepatocytes. Alcoholic steatosis is most commonly asymptomatic and may present symptoms such as tender and enlarged liver. Alcoholic steatosis is associated with a raised GGT and an AST: ALT ratio of >2:1. Steatosis and the associated abnormalities in liver tests usually resolve within the months of abstinence.

Clinical Presentation

Alcoholic steatosis typically are asymptomatic and are diagnosed when the liver biochemistry test or imaging result are abnormal. Examination may show some nonspecific upper abdominal symptoms such as hepatomegaly (Right-upper quadrant discomfort) or other signs of chronic liver diseases.

Alcoholic Hepatitis

Alcoholic hepatitis is a severe condition leads to develop hepatocellular damage and inflammation with a high mortality rate around 40% (9). Usually alcoholic hepatitis presents with fever, jaundice, weight loss, signs of liver failure including sepsis and cirrhosis. Clinically, patients recently diagnose with jaundice may demonstrate other features of hepatic de-compensation. Alcoholic hepatitis is considered to lead chronic liver failure. Examination may reveal tender hepatomegaly or signs of chronic liver disease. Laboratory tests may demonstrate leukocytosis and elevated C-reactive protein levels in the inflammatory condition. It can be associated with a raised in neutrophil count, plasma bilirubin, alkaline phosphatase, aminotransferase (10). Raise in prothrombin time represents synthetic failure resulting coagulopathy. Reduce in plasma albumin reflects poor synthetic function in patients with alcoholic hepatitis. Systemic inflammatory response are unreliable on histologically proven AAH (1,2), as only 50% of patients clinically thought were diagnose to have AAH and 41% of patients clinically thought not to have AHH diagnose of AHH on biopsy. While diagnosing alcoholic hepatitis, other causes of acute or chronic liver disease (vino-occlusive disease or biliary obstruction) should be taken in consideration. Liver biopsy is the most accurate way to diagnosed alcoholic hepatitis. Liver biopsy is important to distinguish between the clinical syndrome of alcoholic hepatitis and the histologic features of alcoholic steato-hepatitis (11).

Clinical Presentation

Chronic alcoholic hepatitis can shows the symptoms of jaundice, upper abdominal pain, tender hepatomegaly, fever and leukocytosis. It further can be associated with transient portal hypertension. Alcoholic hepatitis may progress to hepatic failure and is associated with a high short term risk of death from acute liver failure, sepsis or renal failure. Approximately 50 % cases of alcoholic hepatitis underlay cirrhosis.

Alcoholic Cirrhosis

Alcoholic cirrhosis is a late stage of serious liver disease marked by inflammation (swelling), fibrosis (cellular hardening) and damaged membranes preventing detoxification of chemicals in the body, ending in scarring and necrosis (cell death). About 10% to 20% of heavy drinkers will develop cirrhosis of the liver (NIAA, 1993). Acetaldehyde may be responsible for alcohol-induced fibrosis by stimulating collagen deposition by hepatic stellate cells (12). It is associated with progressive fibrosis, characterized by abnormal accumulation of collagen rich extracellular matrix. Fibrosis encircling within individual hepatocytes eventually forms bridges between adjacent central and portal areas, leading to the formation of nodules resulting in cirrhosis. This change in liver architecture disrupted to flow in the portal vein resulting in increased splanchnic blood flow leading to portal hypertension, which is responsible for ascites and encephalopathy. Episodes of alcoholic hepatitis may trigger the development of cirrhosis. Alcoholic liver disease is typically associated with micro-nodular cirrhosis, with measuring less than 3mm in diameter. Macroscopically, liver tends to become shrunken with an irregular surface. Cirrhosis is a histologic diagnosis, it includes several tests: blood test, aspartate aminotransferase to platelet ratio

index score, fibrosis markers, fibro-test and imaging (ultrasound, CT, MRI, Fro-scan). In early stages patients may be asymptomatic and liver test results may be normal (13). As the disease progress tests can indicate signs of impaired liver function including a raised bilirubin, prothrombin time and a decreased plasma albumin. Hepatic de-compensation and precipitating factors should be considered in patients with cirrhosis. Some causes of hepatic de-compensation are: renal failure or electrolytes disturbance, portal vein thrombosis, hepatocellular carcinoma development, infection and bleeding, and return to alcohol.

Clinical Presentation

Alcoholic cirrhosis may be asymptomatic in compensated patients. Clinical signs of cirrhosis includes: spider nevi, erythema, gynecomastia, and loss of body hair. Patients may suffer from palpable hepatomegaly or splenomegaly and may demonstrate other signified development of edema, varicella bleeding, hepatic encephalopathy or jaundice.

Hepatocellular Carcinoma

Hepatocellular carcinoma is mainly caused by chronic liver inflammation which is mostly occurs in people with alcoholic cirrhosis. Alcohol is well-recognized as an etiologic factor to develop primary liver cancer, or hepatocellular carcinoma (HCC) in adult. It is most common cause of mortality in people with alcoholic cirrhosis (14-15). Hepatocellular carcinoma is also associated with cirrhosis due to chronic viral hepatitis (hepatitis B or C) infection or hemochromatosis. Metabolic syndrome is also recognized as the risk factor for hepatocellular carcinoma (16). Alcoholic cirrhosis is much more highly associated with hepatocellular carcinoma than others. It is estimated to cause 60-70% of cirrhosis (17). Hepatocellular carcinoma can develop even after many years of alcoholic abstinence. Men are at higher risk of developing hepatocellular carcinoma than women, and the incidence increases with age.

Clinical Presentation

Hepatocellular carcinoma may be clinically silent on its early stages. Common clinical features include: right upper quadrant abdominal pain, comprised hepatic synthetic function, anorexia, weight loss, splenomegaly and hepatic-encephalopathy. An enlarged liver may be palpable on examination, and there may be an audible arterial bruit on auscultation.

Conclusion

Excess alcohol consumption can result in a wide range of several liver injuries, including alcoholic steatosis, alcoholic hepatitis, cirrhosis, and hepatocellular carcinoma. Patients with the evidence of any form of alcoholic liver disease are at higher risk of developing chronic hepatic diseases. Such patients are advised to abstain completely from alcohol. Patients with the chronic forms of alcohol-related liver damage are associated with a risk of progression to cirrhosis and hepatocellular carcinoma which may requires additional intervention. Hepatic de-compensation and precipitating factors also should be considered in patients with excess alcohol consumption accordingly to the presentation. Hence an early identification of alcohol associated liver disease can assess on appropriate intervention.

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