Introduction
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*Man's liver is a brownish blob*  
*That does a most prodigious job.*  
*It manufactures gall, or bile*  
*And normally keeps some on file*  
*Stored neatly in a pear-shaped sac.*  
*From there the liver's yields attack*  
*The food man eats, to change its state*  
*By methods man can't duplicate,*  
*Or even halfway understand.*  
*He ought to treat this outsize gland,*  
*With due respect and loving care*  
*To keep it in top-notch repair,*  
*Because to get along at all*  
*Man needs an awful lot of gall.*

(Irene Warsaw, 1975)

The liver is the largest internal organ in the human body and is an organ present in vertebrates and some other animals. A human can live only up to 24 hours without liver function. It plays a major role in metabolism and has a number of functions in the body, including glycogen storage, decomposition of red blood cells, plasma protein synthesis and detoxification. The liver is also the largest gland in the human body. It lies below the diaphragm in the thoracic region of the abdomen. It produces bile, an alkaline compound which aids in digestion, via the emulsification of lipids. It also performs and regulates a wide variety of high-volume biochemical reactions requiring very specialized tissues. Improper function of the liver gives rise to many diseases, directly or indirectly.

“Liver disease” is a term for a collection of conditions, diseases and infections that affect the cells, tissues, structures or functions of the liver that make the liver to
function improperly or cease functioning. Some liver diseases are highly contagious and pose a risk to others. One such disease is hepatitis.

Hepatitis (plural hepatitides) is the term refers to the inflammation of liver (i.e.) it implies injury to liver characterized by presence of inflammatory cells in the liver tissue. From ancient Greek the term hepatitis originated, *hepar* or *hepato-* meaning 'liver,' and suffix *-itis*, denoting 'inflammation'. The most common causes of hepatitis include infection by microbes like viruses, bacteria and fungi and of these viral being the most common. Viruses of viral hepatitis are classified into several types. They are Hepatitis A virus (HAV), Hepatitis B virus (HBV), Hepatitis C virus (HCV), Hepatitis delta agent (HDV), Hepatitis E virus (HEV) and Hepatitis G virus (HGV).

HAV formerly known as infectious hepatitis, is an acute infectious disease of the liver caused by Hepatitis A virus (Ryan and Ray, 2004). HAV is most commonly transmitted by the fecal-oral route via contaminated food or drinking water. Every year approximately 10 million people worldwide are infected with HAV (Thiel, 1998). HAV does not have a chronic stage and does not cause permanent liver damage. In India, limited epidemiological data are available on HAV infection. A few reports suggested that India was hyperendemic for HAV infection with very high infection rates in the first few years of life and most of the population acquiring antibodies to HAV by 10 years of age (Murhekar et al., 2002, Batra et al., 2002, Jindal et al., 2002 and Das et al., 2000). HAV can be prevented by vaccination and hepatitis A vaccine has been proved effective in controlling outbreaks worldwide (Connor, 2005).

HBV is the most common form of blood-borne hepatitis. HBV is much more infectious than the HIV that produces Acquired Immuno Deficiency Syndrome (AIDS). HBV can be transmitted not only through infected blood but also through other body fluids. The disease was originally known as "serum hepatitis" (Barker et al., 1996) and has caused epidemics in parts of Asia and Africa. Hepatitis B is endemic in China and various other parts of Asia (Williams, 2006). Chronic hepatitis B may eventually cause liver cirrhosis and liver cancer, a fatal disease with very poor response to current chemotherapy. The infection is preventable by vaccination (Pungpapong et al., 2007).
HDV is a defective RNA virus dependent on HBV for its replication and expression (Jacobson et al., 1985). HDV is the most unusual of the hepatitis viruses. It does not resemble any other known animal virus and has been classified with the plant virus satellites that are also related to viroids of plants. Transmission of HDV can occur either via simultaneous infection with HBV (coinfection) or via infection of an individual previously infected with HBV (superinfection). Both superinfection and coinfection with HDV results in more severe complications compared to infection with HBV alone. These complications include a greater likelihood of experiencing liver failure in acute infections and a greater likelihood of developing liver cancer in chronic infections. In combination with hepatitis B virus, hepatitis D has the highest mortality rate of all the hepatitis infections. HDV responds poorly to treatment, reactivates readily and can lead to liver failure (Dalekos, 2000).

HEV was not recognized as a unique human disease until 1980. Infection with this virus was first documented in 1955 during an outbreak in New Delhi, India (Gupta and Smetana, 1957). HEV spread mainly through fecal contamination of water supplies or food. Person-to-person transmission is uncommon. HEV occasionally develops into a severe acute liver disease and is fatal in about 2% of all cases. Clinically, it is comparable to HAV but in pregnant women the disease is more often severe and is associated with a clinical syndrome called 'fulminant hepatic failure'. Pregnant women, especially those in the third trimester suffer an elevated mortality rate (20%) from the disease. Mortality rates are generally low for HEV in that it usually goes away by itself and the patient recovers. A vaccine based on recombinant viral proteins has been developed and recently tested in a high-risk population (i.e.) military personnel of a developing country (Shrestha et al., 2007). The vaccine appeared to be effective and safe, but further studies are needed to assess the long-term protection and the cost-effectiveness of hepatitis E vaccination.

Hepatitis G (HGV) is an RNA virus that is very similar to Hepatitis C. However, it has not been associated with any chronic liver disease. In fact, it seems to be a benign virus that is widely present throughout the world. The role of HGV in hepatitis is controversial (Adrian Di Bisceglie, 1996).
HCV infection is the most common chronic blood borne infection in the world (Gasiorowicz et al., 2006). HCV is a small, 50 nm sized, enveloped, positive sense single strand RNA virus. It belongs to the family flaviviridae and the genus hepacivirus, often induces lifelong persistent infection (Alter and Seeff, 2000). HCV infection is often asymptomatic, but ensuing chronic hepatitis can result later in cirrhosis, fibrotic scarring of the liver and liver cancer. It has been estimated that over the next 20 years, the proportion of infected patients with cirrhosis will increase from 16 to 32% and the other complications will also increase dramatically including hepatic decompensation which will increase by 106%, HCC by 81% and liver related deaths by 180% (Davis et al., 2003). Based on genetic differences between HCV isolates, the hepatitis C virus species is classified into six genotypes (1 - 6) with several subtypes within each genotype represented by letters.

The prevalence of HCV infection world wide has been estimated to be about 3% with 170 million people affected (Sy and Jamal, 2006). The prevalence rate as well as the significance of HCV infection varies considerably from country to country, probably because of cultural factors and social habits that influence HCV transmission. HCV, a global health problem is prevalent in India (Jain et al., 2003). A community based Indian study on HCV indicated a seroprevalence of 0.87% in children less than 10 years of age to 1.85% in those above 60 years of age (Chowdhury et al., 2003).


Khaja, (2002) have highlighted a major health problem due to HCV which accounts for one-fourth of all cases of chronic liver diseases in India. It is estimated that there are 12.5 million HCV carriers in India (Sen, 2001) and at least a quarter of them are likely to develop chronic liver disease in the next 10 to 15 years. In the absence of
efficient anti-HCV screening among blood donors in India, post-transfusion HCV-
induced chronic liver disease is likely to increase.

Until the mid-1990s, interferon alfa (IFN-α) was the only available treatment. The addition of ribavirin, a nucleoside analogue substantially improved the response. However, viral genotype remains an important determinant of response rate (Gow, 2001). It seems that interferon treatment alone or in combination may prevent progression of, or even reverse, hepatic fibrosis in infected patients even if cure is not achieved (Poynard et al., 2000). In registration trials of pegylated interferon and ribavirin, significant side effects resulted in discontinuation of treatment in approximately 10 to 14% of patients. Major side effects of combination therapy includes influenza-like symptoms, hematologic abnormalities, and neuropsychiatric symptoms. The most commonly reported side effects of interferon include fatigue, headaches or migraine, nausea and insomnia. Side effects usually disappear soon after treatment is stopped. However, they can adversely affect patients adherence to treatment. In clinical trials, between 10% and 50% of patients on treatment reduce doses or discontinue treatment because side effects become dangerous or intolerable (Potgieter et al., 2005 & Bernstein et al., 2002). For some patients, preventing the adverse effects of treatment becomes more important than trying to eradicate the virus. Because of the difficulties associated with therapy, the decision to commence treatment is often delayed, especially if a patient has no signs of significant liver damage like cirrhosis and if the symptoms of HCV are not having a negative impact on their daily life (Sievert, 2001).

In a developing country like India the cost of combinational therapy of interferon for chronic hepatitis C treatment may cost something around Rs 2.5 - 4.5 lakhs. Since a majority of the population is not covered by health insurance, financial constraints become a major obstacle for many patients to initiate therapy. As the chronic consequences HCV infection are becoming more evident, public concern is escalating. Therefore, there is a need to explore the scope of cost-effective novel drug from natural resource with minimal side effects in the treatment of chronic HCV. The use of medicinal plants to treat human diseases has been performed for millennia. Nowadays, it is known that 80% of the world population have already taken medicinal plants and 30% were prescribed by physicians. Indigenous herbs and plants have
received recent attention for the treatment of liver disorders also. Internationally, there are more than 600 commercial preparations with claims of liver protective activity. About 100 Indian medicinal plants are available as hepatoprotective formulations (Bhatt, 1996).

With the increasing trend in the incidence of HCV in our country, biomedical research directed at early detection and diagnosis, prognosis and survival, as well as prevention of HCV is of prime importance. The aim of permanent HCV cure can be achieved by the use of non-cytotoxic nutrients, herbal preparations/natural plant products, and/or pharmacological agents. Encouraging dietary intake with herbal supplements may therefore be an effective strategy to limit liver related diseases, particularly for HCV. Future advances in the diagnosis and management of HCV require continued vigilance in the transmission of this infection and by introduction of more effective therapies. In the backdrop of these international literatures and extremely limited Indian data on HCV, the present study was planned to investigate the prevalence of HCV, genotypes of HCV in the study area and anti HCV property of three selected Indian medicinal plants and their phytochemistry.