

# Natural Treatment of Alcoholic Hepatic Cirrhosis with Medicinal Herb

Pankaj Varshney<sup>1</sup>, Dr. Kailash Bhargava<sup>2</sup>

Research Scholar, Dept. of Chemistry, Himalayan University, Arunachal Pradesh, India<sup>1</sup>

Associate Professor, Dept. of Chemistry, Himalayan University, Arunachal Pradesh, India<sup>2</sup>

**ABSTRACT:** Alcohol is poisonous in large volumes, the situation becomes complicated when due to any reason, it gets associated with polyunsaturated fatty acids. Because, in that situation it starts inducing oxidative stress & hepatotoxicity. In this condition alcohol causes destruction of cells in the stomach and intestines that act as a go-between the absorption of nutrients. Alcohol mainly enhance the absorption of lead in human body. The low level of lead concentration may lead to the disturbance of normal biochemical process in the hepato-biliary system. The higher volume of lead causes liver cells to become large in size into hyperplasia consequently, it may start the formation of tumors in the liver. Due to this liver cells eliminated more quickly and get replaced by fatty deposits. The major cause which mediate fibrogenic and mutagenic effects of alcohol in the liver is acetaldehyde which is a major toxic metabolite. The amount of nutrients is reduced due to liver cirrhosis. The main contribution in the damage of cell is mainly by the by-products of alcohol metabolism because it generates oxidants. An oxidative stress is produced due to imbalance of oxidants and antioxidants. An oxidative stress may be defined a state marked by continued production of oxidizing agents and escalation of cell damage. The cumulative result is that hepatotoxicity develops, liver gets unable to neutralize oxidants' scavenging capacity. Escalation of cell damage leads to degeneration of liver cells and their regenerative capacity is also lost under such critical situation. In view of that there is a need of the anti-oxidant drugs which have scavenging capacity to detoxify the liver, with higher bioavailability. Such compounds are rather difficult to synthesize in the laboratory. However, in Indigenous medicinal system, there are several herbs which are effective in liver diseases. This article aims to discuss these possibilities of natural treatment of alcoholic liver disease by medicinal herbs, and hopes to ignite the fruitful research that would help mankind.

**KEYWORDS:** Malanoaldehyde Bile pigments and bilirubin, Kupffer cell Lipid peroxidation. Hepatotoxicity

## I. INTRODUCTION

A specific type of liver damage in which healthy cells are removed and scar tissue gets placed in place of them is called alcoholic liver cirrhosis. This is a critical disease. The liver cirrhosis is mainly caused due to excessive and chronic alcohol consumption. It is developed in many years. Alcohol is an attractive compound. The chemical composition of alcohol reveals that it releases high amount of energy when chemically broken down. Under the effect of alcohol a person feels energetic but it is an unhealthy fuel. The consumption of alcohol also causes reduction of specific nutrients including magnesium, zinc, copper, iron and some B-complex vitamins also. This may result in many serious situations. A cruel cycle often occurs when nutritional deficiencies develop. The natural energy system of the body becomes crippled. This can cause a desire for alcohol as the fuel of interest, since it uses a different metabolic pathway to produce energy in the body. Once if any person begins drinking alcohol in large quantity the nutrient deficiencies getting worst and this further increase the cravings for alcohol. The liver is not able to execute its vital functions. [1,2] The development of cirrhosis can take place over months or years. There is no cure of this problem. The objective of this treatment only aims to delay liver damage, reduce the risk of complications and manage the symptoms. There are many causes of liver cirrhosis like hepatitis B and C, excessive drinking of alcohol, and fatty liver. The inflammation of the liver is called Hepatitis. Hepatitis is of different type's e.g. viral hepatitis, hepatitis B, hepatitis C. Irrelevant to the type, alcohol increases risk of developing cirrhosis. If a patient of liver cirrhosis is not under medical treatment due to any reason, it may result to life-threat.

## II. LIVER DISORDER PROBLEMS

Liver disease is a general term which represents different conditions, diseases, and infections that badly affect the cells, structures, tissues, or working of the liver. As a result of this result, the bile pigments increases and bilirubin in the blood, giving the skin and mucus membrane a yellow tinge. As we know that the liver is a very important organ

in human body which is responsible for filtering the blood. It also makes bile which helps to digest fat and remove certain fatty materials. It helps the body transport and save energy. Liver is also helpful in making important proteins which are mainly involved in blood clotting such as barbiturates, amphetamines etc. This is also helpful in storing iron, several of the Vitamins B, Vitamins A and D. The important protein like albumin that regulates fluid transport in the blood and kidneys is also produced with the help of liver. [3,4] It helps in breakdown and recycles red blood sales. Cirrhosis is a dangerous disease that changes the structure or shape of the liver so that it becomes difficult to function properly. One of the major problems with cirrhosis is that the sufficient amount of blood not flows through the liver and due to that the toxins which are normally eliminated from the body remain unresolved and becomes poisonous for the body. Most of the heavy drinkers eventually develop cirrhosis and alcoholic hepatitis is often a precursor of cirrhosis. This situation can be a result of poor nutrition, common bacterial infection, poisonous substances that generates inflammation and consequently weekend the liver.[5,6]

### III. IMPORTANCE OF MICRONUTRIENTS

Micronutrients are vitamins, minerals that all human needs in order to keep their body strong and prevent diseases. Micronutrients deficiency in human body caused by in adequate rich food, high risk of infection and parasites, dietary practices and detrimental feeding. Micronutrient deficiency badly affects the health of a human body as well as to the overall resistance to the illness. Proper intake of vitamins and minerals can make the difference between a healthy productive life and a life fraud with illness. [7,8] The deficiency of zinc has a bad effect on circulation it is related to cold hands and feet and also with high blood pressure. Cholesterol in the blood always has a tendency to rise can also show effect on the emotional and addictive behavior such as alcoholism and obsessions. When we consider the case of alcoholism, alcohol reduces zinc from the body when it is consumed and as a result of this it starts a down ward cycle of craving more alcohol which further reduces the amount of zinc and so on. The deficiency of zinc is common. Finally, we find that zinc is a very important mineral with over more than 300 enzymes which are helpful in healing wound, maintaining fertility in adult, protects against free radicals, increases immunity, and synthesizes protein and help in the reproduction of cell. Deficiency is very common and it can cause major health problems if it exists for the longer time. Low sodium Intake also resulting reduction in zinc retention while zinc is critical or we can say zinc is very important for normal growth of the body. It plays an important role in the immune system as well as it is important for the proper function of at least 70 enzymes which protects our body cells from various damages. Micronutrients have a central role in the metabolism of our body and also show in the maintenance of tissue function. Adequate intake of micronutrients is very necessary to sustain metabolism and tissue function but excess of micronutrients may be harmful. Further research is required to characterize the micronutrient status both in terms of metabolic effects and antioxidants effects. However, micronutrients as a whole consists of vitamins and minerals but there are fundamental difference between them. [9,10]

Vitamins are organic compounds and it can be broken down by air, acid and heat, while on the other hand minerals are inorganic and they have their own chemical structure. Relation of micro nutrients is not always cooperative for example Vitamin C reduces the body's ability to assimilate the essential mineral copper. Another example, overload of the mineral Mn can worsen the iron deficiency. The human body requires and stores large amounts of the major minerals. These minerals are no more important to health than the trace minerals only present in body in greater amount. Major minerals flows into the body in different ways e.g. Potassium is promptly absorbed into the bloodstream while in case of calcium it is more likely a fat soluble vitamin because it requires a carrier for absorption and transport. The human body keeps the balance between every element process in the diet, without keeping such balance; cells would not be able to function properly. Magnesium is obtained naturally from foods like green vegetables etc. Apart from natural resources some people require dietary supplement to maintain an adequate supply. [11]

#### 3.1 Selenium

Selenium is required for immune system and for the synthesis of thyroid hormones. Apart from this, these minerals assist enzymes in the protection of cell membranes from the damage. Low Selenium intake reduces the ability of human body to the resistance more than 25 viral infections. If anyone requires an overall good health, then he or she should take appropriate amount of each component. Whether they are macronutrients or micro nutrients, vitamins, trace minerals or major minerals, every component has its own unique role in the growth of human body.

#### 3.2 Calcium

If in any human body there is an excess of calcium then it may cause mineral imbalance because it interfere with the absorption of zinc, magnesium, iron and other minerals. On the other hand, if calcium is too little in a human body, it may cause osteoporosis. Few researchers and scientist also connect low calcium to colon cancer and high blood

pressure. The minerals less than hundred milligrams per day are known as trace minerals. Few examples of trace minerals are fluoride, chromium, copper, iodine, iron, manganese, molybdenum, selenium and zinc.

### 3.3 Magnesium

We know that magnesium help enzymes in more than 300 chemical reactions in the human body. It also supports cellular activity, participates in muscle contraction and aids in blood clotting. Magnesium is a nutrient which is very important for the body for its well being. More than one third of magnesium in digest is absorbed and the rest of the magnesium is excreted. The Skeleton of the human body contains about half the body is magnesium and only 30 percentages present in the blood. The rest of the magnesium is contained in cell and they are used in various processes like protein synthesis, energy metabolism etc. [12,13] Everybody has its own mechanism to assure required magnesium level in the blood streams at certain level. Magnesium is also required for the proper growth of bones and maintenance of bones in human body. It is helpful for the smooth functioning of nerves, muscles and various other parts of the body. Magnesium helps our heart to maintain its normal rhythm. It also helps our body to convert glucose into energy and it is also necessary for the metabolism of the micronutrients calcium and Vitamin C.

### 3.4 Molybdenum

Molybdenum helps many enzymes including those required for the metabolism of sulfur-containing amino acids. Molybdenum toxicity and deficiency are not very often. However, if any one takes large amount of molybdenum, copper absorption gets inhibited.

### 3.5 Vitamin A

Vitamin A is a necessary component for optimal development of our health. In children, the deficiency of vitamin A affects the immune system, increases the risk of serious illness. Sometimes, this may result to cause of death from diarrheal diseases and other infections such as measles. Vitamin A is available in two forms, one form is from animal sources and the second form is available from plants. As far as, absorption is concerned those which is available from the animal sources has greater absorption. Deficiency is the result of insufficient amount of intake of animal sources of vitamin A and not up to the mark absorption of plant sources which often happens due to inadequate fat thru oil in our daily food.[14,15]

### 3.6 Vitamin B

The most important vitamin that is known as folate also called B9 is required in the body for the production and maintenance of new cell, the absorption of this vitamin is badly affected by the consumption of alcohol. Alcohol restricts the absorption of folate and other vitamins by damaging the cells, lining the stomach and intestine which are responsible for the absorption of these nutrients.

Calcium is needed for the blood vessel and contraction and expansion of the muscle for the creation of enzymes and hormones. The consumption of alcohol is the main reason of the loss of calcium. Various deficiencies like damage of liver and other parts of the body due to excessive alcohol consumption causes serious problem which ultimately results deficiencies in vitamins and minerals.

### 3.7 Thymine

Alcohol reduces the capacity of body to absorb the vitamin thymine also known as B1. The main working of this vitamin is to breakdown carbohydrates and protein in the food. It is also helpful in the production of hemoglobin, the protein which binds oxygen in red blood cells. If there is a severe deficiency in thymine, it may lead to life threatening brain disorder known as Wernicke-Korsakoff Syndrome.[16,17]

## IV. VARIOUS MICRONUTRIENTS

As we know that good health requires the presence of various micronutrients. For example, vitamin A and Vitamin C are required for or intestinal iron absorption. Sufficient amount of vitamin B2, B6, B9 and B12 are necessary for the production of red blood cells. Health experts are getting known to this fact that populations deficient in one vitamin or mineral are usually deficient in other micronutrients as well as minerals. Intracellular potassium is correlated with the intracellular magnesium. Magnesium is generally observed in the gastrointestinal trace and it is more observed when status is lower. In human body there is a competition between the magnesium and the calcium to keep a check on calcium. However, it may result to do calcium deficiency if the level of calcium in a human body is already low. Low and high protein intake restrict the magnesium absorption in a human body and other factors such as phosphate, phytate, and fat affect absorption.

#### 4.1 Iron

Iron has a very important role in human body. It acts like a carrier for oxygen from the lungs to the body's tissues. It does so in the form of hemoglobin. Iron deficiency leads to anemia; the most common reason of anemia is a condition in which the blood has lesser number of healthy red blood cells to carry oxygen which may result into morbidity and death.[18,19]

Iron is an essential trace mineral found in nearly all living organisms. Iron containing protein and enzymes, also sometimes it contains heme prosthetic groups, involved in many biological oxidation and in transport. Few examples of proteins found in higher organism include cytochrome and hemoglobin. The human body stores some iron to replace if it is lost. However, if iron level in human body remains low for a longer time it can lead to iron deficiency anemia. When the human body has sufficient iron to meet its requirement then and it stores the excess amount for later use in all cells but mostly in the bone marrow, liver spleen. These stores are collectively known as ferritin complexes and are part of human or other animals iron metabolism systems.

##### 4.1.1 Iron deficiency anemia

Iron is responsible for maintaining many body functions, including the molecule in blood that carries oxygen, the production of hemoglobin to maintain healthy cells in hair, nail and skin. Iron is stored in the liver as ferritin and released whenever it is required to make new red blood cells in the bone marrow. Generally, the life of red blood cells is about 120 days in circulation and after that they are re observed by the spleen. Iron can also be recycled from these old cells by the body. A human body needs certain vitamins, minerals and nutrients to make sufficient amount of red blood cells. Iron, B12 vitamin and Folic acid are the three of the most important vitamins or minerals.[20,21]

Copper is necessary to all living organism as a traces dietary mineral because it is a key component of the recipe tree and join complex cytochrome. The main area where copper is found in human body is liver, bone and muscle. The copper along with the Iron is helpful in the human body to form red blood cells. It also helps to keep the blood vessels, nerves, immune system, and bones healthy. If in a human body, there is a lack of copper it may lead to osteoporosis and anemia.

#### 4.2 Manganese

The main role of Manganese in human body is the formation of bone and production of energy. It is also helpful to metabolize the macronutrients, carbohydrate fat and protein in many enzyme mediated chemical reactions manganese is very important. One of the most vital functions of Manganese is the regulation of body's metabolism. The enzymes which are activated by the manganese are help full in the metabolism of carbohydrates, amino acids and cholesterol. It is also important for the metabolism of vitamins like Vitamin B1 and Vitamin E. Not only this, but it also helps the liver to function properly and run smoothly.

#### 4.3 Chromium

Trivalent chromium ions are required in trace amounts for sugar and lipid metabolism. If chromium is used in large amount it can be toxic and carcinogenic. A major example of toxic chromium is hexavalent chromium. Chromium is a mineral that human body requires in trace amount. Chromium like other transition metal elements is very much important to our human life at low concentration because at higher concentration it becomes toxic. The precise mechanism by which chromium is both an essential metal and a carcinogen are not clearly defined. As we know that chromium which is not soluble in water and the metallic chromium cannot be considered a health hazard, while the toxicity and carcinogenic properties of chromium VI have been known for many years. Only limited amount of chromium enter the cells, several researches has shown that high concentration of chromium can lead to the damage in DNA. The role of chromium is alcoholic.

### V. LIVER DISORDERS

Liver cirrhosis is very crucial liver disorder. In the case of liver disorder, it has been found that rancid oil is a main cause of liver disorder. Rancid oil creates free radicals in body which are known to damage the cells and also they are associated with diabetes and Alzheimer's disease. Not only this, rancid oil also cause digestive disorder and deficiency of the vitamins in human body specially vitamin B and Vitamin E.

#### 5.1 Rancidification

There are many problems which may cause in human body like rancidification and aging. Rancidification is the product act of rancidity. Rancidity is the chemical decomposition of oils, fats and other lipids. Particularly, it is the hydrolysis and/or autoxidation of fats into short-chain aldehydes and ketones. Oxidative rancidity is related with the degradation by oxygen in the air. Through a free radical process; the double bonds of an unsaturated fatty acid can undergo cleavage releasing volatile aldehydes and ketones. Many ketones and aldehydes are classified as carcinogens.

Aldehydes are organic compounds that are widely found in nature. Acetaldehyde, a major toxic metal light is one of the main culprit mediating fibrogenic and mutagenic effects of alcohol in the liver. Kupffer cell is internally involved in the liver's response to, resection, infection and other toxic effects. This summarizes the basic concept of Kupffer cell for function as well as their role in pathogenesis of various liver diseases. Kupffer cell activation is mainly responsible for ethanol induced liver injury which is common in chronic alcoholic. Cells are resident macrophages of the liver and play a very important role in its normal homeostasis and Physiology. They also participate in the chronic and acute responses of the liver to toxic compounds. Kupffer cell play a central role in the hepatic response to toxic and carcinogenic agents. Lipid peroxidation produces many aldehydes that also have toxicological significance. [22,23]

### 5.2 Vitamins

Vitamins A, C, D, E, K, and the B vitamins are also deficient in some alcoholic. They are important in wound healing and cell maintenance. Especially, vitamin K is essential in blood clotting; deficiency of Vitamin K reduces blood clotting and consequently results in excess bleeding.

### 5.3 Minerals

There are various minerals which are important for our human body. Some of them are calcium, magnesium, iron and Zinc. In alcoholic people deficiency of these minerals seems secondary to other alcohol related problems. Mineral deficiency can cause a various medical consequences from bone diseases, night blindness and skin diseases. However, the alcoholic liver damage is primarily caused by the alcohol itself but it further increases if nutrition is poor. For example, carotenoids are the commonly found nutrients in the human liver which is the major source of vitamin A and vitamin E compounds. These nutrients are badly affected by alcohol consumption and the decrease in such type of nutrients may play a significant role in alcohol related liver damage.

## VI. MEDICINAL PLANTS

Medicinal plants have been used in the treatment of liver diseases from many decades. Many leads from plant sources have been found as potential hepatoprotective agents having diverse chemical composition. Though, there is a large list of hepatoprotective agents available in the scientific literature, only few of them are useful in the prevention of liver damage. Out of which, few of them are given below who have attracted the scientific community in a great extent.

### 6.1 Long Pepper (*Piper longum*)

The long pepper is known to have liver protective functions. It helps the body to manage the liver toxicity and prevent jaundice. In our country, long pepper contains a chemical called piperine. Piperine is able to fight certain parasites that can cause infection in a human body. It also seems to make changes in the lining of the intestine. These changes are useful in the absorption of some drugs and other substances taken orally. Piperine increases thermogenesis. It also shows improved bioavailability of the nutritive substances like amino acids, pyroxidine, cumin, selenium and beta carotene to the body. Many researches have shown that it is piperin that greatly affects the bioavailability of drugs. The doses of many drugs can be reduced to a great extent when they are mixed with piperamids. A combination of *Zingiber officinale*, *Piper nigrum* and *Piper longum* increases the drug bioavailability. It has been shown that *Piper nigrum* and *Piper longum* are almost equally effective. Pepper corns are made of health benefiting oils such as piperin which is an amine alkaloid that gives strong spicy pungent character to the pepper. Apart from this, it also contains various monoterpenes hydrocarbons such as mercene, terpen, pinene etc.

Black pepper corns contain a good amount of minerals like magnesium, calcium, manganese, potassium, iron and Zinc. Potassium is an important component of cell and body fluids which is helpful to maintain the reasonable heart rate and blood pressure. Manganese is used in the human body as a cofactor for the antioxidant enzyme, superoxide dismutase. The role of iron in human body is that it is essential for blood cell production and cellular respiration. They are also an excellent source of many important B vitamins such as thiamin, pyridoxine, riboflavin and niacin. Pepper corns are also good source of various types of antioxidant vitamins such as Vitamin A and vitamin C. They are also so rich in flavonoid polyphenolic antioxidants like cryptoxanthin, carotenes, lycopene and zeaxanthin. The presence of these compounds in a human body help the body to remove harmful radicals and also helps protect from cancer and diseases.

### 6.2 *Ecliptaalba*

In traditional ayurvedic medicine, the leaf extract are considered as a powerful tonic. The medicinal plant *Eclipta alba* contains coumestans i.e. steroids, flavonoids, polypeptides etc. Coumestans are known to possess estrogenic activity. *Ecliptaalba* is also considered as a very powerful liver tonic. This herb keeps right liver and cures jaundice fatty liver etc. It is more effective when it is used in a combination with *P. niruri*. It improves the functional status of hepatic drug metabolizing enzymes and also helps to remove toxins and purify blood. *Eclipta* is commonly used as de-obstruent



increase bile flow and to protect the liver parenchymal tissue in viral hepatitis and also in other situation involving hepatic enlargement. In the treatment of fevers, liver disorders, rheumatic joint pains and edema, the fresh juice of the leaves is given. It is also used to stimulate digestion and the appetite. *Eclipta prostrata* also improve the functional status of hepatic drug metabolizing enzymes.[24,25]

### 6.3 *Phyllanthus niruri*

*Phyllanthus niruri* is very useful in the prevention of liver damage. *Phyllanthus niruri* has the property of being anti-hepatitis B, anti- liver damage. The active compound phyllanthin and hypophyllanthin are extracted from its leaves. After few years nirtetralin, phyltetralin and lignansniranthin have been isolated from the leaves. Also these three compounds are the major component of many commonly used liver tonics in our country. Fresh juice and powder of dried plant are also used widely in ayurvedic preparations. As we know that alcohol is a toxin in higher doses and when this alcohol is associated with polyunsaturated fatty acids (PUSA) then it produces oxidative stress and hepatotoxicity. *P niruri* efficiently reduces the oxidative stress and hepatotoxicity. An aqua extracts of the plant *Phyllanthus niruri* show the endogenous DNA polymerase of hepatitis B virus and binds to the surface antigen of hepatitis B virus, in-vitro.

#### 6.3.1 Advantages of *Phyllanthus niruri*

In the earlier study, we found that plants of the *Phyllanthus* genus contain various compounds with antioxidants and health enhancing properties. In many laboratory researches, scientists found that certain species of *Phyllanthus* are very much helpful in the prevention of liver damage. *P.niruri* exhibit hepatitis B virus surface antigen activity. Infectious hepatitis causes due to the inability of the human body or due to weak immune system which is not able to eliminate the virus from liver cells. *Phyllanthus niruri* has the capacity to show proliferation of virus by showing replication of the genetic material of the virus. It can also act as a diuretic medicine and preventive sheet for jaundice and other liver related disease. The protein fraction of *P.niruri* protects liver tissues against oxidative stress by impairing anti oxidative defense. It is very useful in treatment jaundice liver cirrhosis. It is also helpful to repair fatty liver and liver damage which have been caused due to a reason. It promotes liver action inhibitory effect on human immunodeficiency virus. If any person regularly takes it in the morning with empty stomach then he or she may get rid of from toxin CCl<sub>4</sub>. High level of malondialdehyde was found in every group. In a laboratory research, it was found that an extract of *P.niruri* had increased faecal bile excretion, enhanced plasma lethicin, lipid lowering activity and cholesterol acyltransferase activity.

#### 6.3.2 Keampferol

Keampferol is a strong antioxidant and it is helpful in the prevention of oxidative damage of DNA, lipids and cells. Keampferol can prevent arteriosclerosis by restricting the oxidation of low density lipoprotein and the formation of platelets in the blood. Many studies have confirmed that the Keampferol plays a role of chemopreventive agent which means that Keampferol inhibits the formation of cancer cells.

### 6.4 *Andrographis*

This medicinal plant is also used in the many area of different conditions. It is used in the conditions like enlarged liver damage due to medications and digestive complaints. The earlier research made on animals suggested that andrographis is beneficial in the prevention various heart diseases. This advance preliminary studies showed that andrographis are also useful in the protection of liver from toxic injuries. Andrographis is considered as one of the most successful liver protective medicinal plant milk thistle. It also appears to stimulate gallbladder contraction. There is no side effect associated with andrographis. In a research the participants word kept under observation and no problem was found in those participants. Finally, we can say that andrographis does stimulate the immune system, this may result to a whole host of potential risks. The immune system of a human body is balanced on a knife edge. If in a human body, its immune system is too relaxed then it will not be capable to protect us from infections while on the other hand if immune system is to active, it may attack healthy tissues and due to that autoimmune diseases may cause. Universal immune booster can cause Graves' disease, multiple sclerosis, rheumatoid arthritis apart from other illness. The hepatoprotective action of andrographolide is also associated to the activity of certain metabolic enzymes.[24]

### 6.5 *Boerhaaviadiffusa*

In our country millions of people use *Boerhaaviadiffusa* in the treatment of various disorders in ayurvedic herbal medicine. Not only in India, but also in Sri Lanka,Nepal it is being used. This herb has also indirect influence in Chinese,Tibetan and Unani medicines. The root of this herb is especially used to treat internal inflammation of all kinds, dyspepsia,enlargement of spleen, jaundice, menstrual disorders, anaemia, liver, gallbladder and kidney disorders, abdominal pain, gonorrhoea and cancers. Though, the other parts of this herb like leaves, aerial parts and in some cases the whole plant is also used in the treatment

The root, leaves, aerial parts or in some cases the whole plant of *Boerhaaviadiffusa* is also used in the treatment of various diseases. In the laboratory research the hepatoprotective effects of *B.diffusa* is widely studied. It was found that *B. diffusa* protects from hepatotoxic action of C.M. L. as evidenced by changes in Triglycerides (TG), Cholesterol, serum alanine aminotransferase (ALT), and total lipid levels in both serum and tissues under laboratory conditions. In animals it was found that there is remarkable reduction in fat deposits when they were receiving *B.diffusa* in combination with C.M.L. An extract of whole plant *Boerhaaviadiffusa* with alcohol when given orally showed hepatoprotective activity in comparison of experimentally induced ccl4 hepatotoxicity in rats and mice. This extract also generated an increase in normal bile flow in rats which resulted a strong choleric activity.

#### 6.6 *Tephrosiapurpurea*

Ayurved is a traditional medicine system which is being used in India and also in various other countries since many decades. According to Ayurveda, plant is digestible, alternative, cures diseases of heart, liver, spleen, ulcers, poison etc. If we take concept of Unani system of medicine, root is diuretic, enriches blood, useful in bronchitis asthma, inflammations, boils and pimples, spleen diseases. The leaves of this medicinal plant act as a tonic to intestine and a good appetizer. *Tephrosiapurpurea* is a well known medicinal plant used in the treatment of various diseases and disorders like urinary tract anti-effective, antibacterial in acne vulgaris and also act as a blood purifier, alcoholic liver cirrhosis, protein energy malnutrition, viral hepatitis, radiation and chemotherapy induced liver damage. As we know that spleen plays vital role in the maintenance of red blood cell. Consequently, the same way *Tephrosiapurpurea* is also useful in maintaining the normal hemoglobin level and normal functioning of the blood. It also corrects the working of digestive system by improving the liver function and benefits in metabolic disorders also promotes increased bile production to help reduce level of fat in the liver.

#### 6.7 *Aloe vera*

The Aloe vera juice is considered as one of the finest body cleanser which cleans waste matter from the kidneys, bladder, liver, stomach, spleen and also considered as the finest colon cleanser. Many researches showed that it is soothing and healing in the relief ulcers, indigestion and stomach distress. *Aloe vera* is a powerful detoxifier, tonic and antiseptic for the nervous system. It also has antiviral properties and immune boosting property. Aloe vera also consists of many minerals which are important to the growth process and healthy function of all the systems of a human body. The ingredients in *Aloe vera* can be classified into the following categories like enzymes, vitamins, lignins, anthraquinone, salicylic acid and saponins. In a research, it was found that there are 15 different compound groups of nutrients present in the *Aloe vera* which makes the plant more effective. As a result of this, we can say that *Aloe vera* effect cannot be synthesized easily in a laboratory. *Aloe vera* contains vitamin A and E, magnesium, protein, calcium and is naturally rich in vitamin C. As we know that Vitamin C is helpful to maintain tone of blood vessels and promotes circulation of blood. Vitamin C is also essential for the health of adrenal gland which supports our body in the time of stress. Amino acids are the chains of atoms which constitutes protein in a human body. Enzymes which are the life principle in every human life, molecule of natural raw food and organic atom rejuvenate old issue and promote healthy skin. [25]

#### 6.8 Radish

This herb is very much useful in the treatment of Jaundice because this is a powerful detoxifier which makes it good for both liver and stomach by removing waste and toxins. They also remove bilirubin and keep production of this compound stable makes them very much useful in the treatment of jaundice. They are also helpful in the improvement of the blood supply of oxygen and consequently help in the reduction of the destruction of red blood cells which is caused by jaundice.

#### 6.9 Turmeric

Turmeric very much important for the liver. It protects the liver from any type of damage which is caused due to eating of foods that contain high amounts of fat and excessive alcohol consumption. In a research, it was found that turmeric has antioxidative anticarcinogenic and hypocholesterolemic action. Turmeric changes the way a body metabolizes fatty acids. This action helps in keeping the liver healthy and is important to protecting the liver from diseases like non alcoholic fatty liver disease and damage caused due to excessive accumulation of fats in and around the liver. The root of this plant has the potential to prevent alcohol induced liver disease. It has been observed that turmeric has a particular compound which blocks a specific gene which is related to inflammation and necrosis of the liver due to excessive alcohol consumption. Turmeric was found to protect the liver from both type of damages whether it is pathological damage or it is biochemical damage. The pathological damage is generally caused due to an unhealthy lifestyle. Antioxidants present in the turmeric has anticancer effect and also protects the kidney, liver and brain from the damage by radiation, chemicals, drugs, heavy metals and alcohol. In a research, it was found that the curcumin present in turmeric delay the liver damage that leads to cirrhosis.

### 6.10 *Cyperus scariosus*

*Cyperus scariosus* has a natural antiviral composition. It is accepted as a carrier oils in the treatment of disorders related to acute Hepatitis B and chronic and many other viral diseases of the liver. This happens mainly due to the medicinal plants positive effect on the liver by easing it's healing and detoxification.

### 6.11 *Paederia foetida*

*Paederia foetida* is able to condition the hepatocyte so as to cause regeneration of hepatic homeostasis, decreasing the leakage of enzymes into the circulation. Stabilization of serum bilirubin and hepatic LPO levels by the administration of the extract is also a clear indication of the improvement of the structural integrity and functional status of the liver cells.

### 6.12 *Picrorhiza kurroa*

*Picrorhiza kurroa* is commonly known as one of the major income generating non-timber forest products found in the Nepalese of Himalayas. It has a long history of use in Indian ayurvedic medicine for the treatment of various digestive problems. In other diseases like asthma, wandering, vitiligo and liver damage this herb is also useful. However, the medical evidence is not available but based on its long history of traditional use it appears to be relatively safe in the treatment of above diseases.[21]

## VII. CONCLUSION

We have observed that when human body is overloaded with toxins such as alcohol or are exposed to increased level of heavy metals, then after a certain limit the detoxifying capacity of the liver runs out. Heavy alcohol consumption is the most common cause of liver cirrhosis. Alcohol destroys the cells lining in the stomach and intestine that acts as a medium in the absorption of nutrients. Alcohol greatly increases the lead absorption. Deficiencies of minerals such as zinc, iron, calcium, magnesium are common in alcoholics. Kupffer cell activation is mainly responsible for early ethanol induced liver injury which is more common in chronic alcoholics. The damage of liver and other organs of human body due to excessive alcohol consumption causes serious problem leading to the deficiencies of vitamins and minerals. Alcohol creates disturbance to use vitamins. The breakdown of vitamin A accelerates and leads to deficiency of vitamin A in the liver. Only a small amount of alcohol destroys vitamins B6, B12 and folic acid. *Eclipta* is used for assisting elevated contaminant removal and cleansing the bloodstream. It also improves the functional status of hepatic drug metabolizing enzymes. It is useful to purify blood and removal of toxins. *Eclipta prostrata* can be considered as a powerful liver tonic. It is more effective when taken as a combination with *P. niruri*. *Piper longum* also known as Indian long pepper contains a chemical called piperine. Piperine is responsible to change the lining of the intestine. This change is useful for those drugs and other substances which are taken orally in their absorption to the human body. Piperine increases thermogenesis. It also improves the bioavailability of the nutritive substances such as pyrooxidine (B6), glucose, amino acids, beta carotene, curcumin and selenium to the body. *Piper longum* is an aromatic pepper like herb which scrapes toxic build up from cell walls, tissues and arteries. Piper increases the digestive fire to assimilate more and more nutrients. It purifies lungs to promote or to improve fuller and clear breathing. *P. niruri* have significant amount of chemical compounds- protein lipid ash fibre, carbohydrate and minerals such as calcium, potassium, copper, manganese, iron, chromium etc. Few studies have confirmed that kaempferol plays the role of chemopreventive agent which means it restricts the formation of cancer cells. The extracts of *P. niruri* reduces the malonaldehyde level. Silymarin is an extract obtained from the seeds of the plant *Silybum marianum* and is widely used as a supportive therapy for various types of liver disorder like hepatitis, fatty acid infiltration and cirrhosis. *Boerhaavia diffusa* shows the hepatoprotective activity against the experimentally induced ccl4 hepatotoxicity in rats and mice. It also increases the bile flow and suggesting a strong choleric activity. The juice of *Boerhaavia diffusa* leaves can also be used as a blood purifier and in the relief of muscular pain. It has regenerative capacity. *Aloe vera* is a powerful detoxifier with vitamins, minerals, enzymes and salicylic acid which rejuvenates body tissues. *Aloe vera* is also commonly called body cleanser. From the above discussion we can conclude that these medicinal plants have potential hepatoprotective phytochemicals. Selective and careful use of these medicinal plants is helpful in the treatment of various liver disorders and diseases.[25]

## REFERENCES

- [1]. "Alcoholic Liver Disease: Introduction". Johns Hopkins Medicine: Gastroenterology & Hepatology. Baltimore, MD: Johns Hopkins Hospital. 2010.
- [2]. "Alcoholic Liver Disease". Common Gastrointestinal Problems: A Consumer Health Guide. Arlington, VA: American College of Gastroenterology. 2010.
- [3]. Bjelakovic, Goran, ed. "Antioxidant supplements for liver diseases". Cochrane Database Syst Rev(3): CD007749. doi:10.1002/14651858.CD007749.pub2. PMID 21412909.



- [4]. Rambaldi A, Jacobs BP, Iaquinto G, Gluud C (November 2005). "Milk thistle for alcoholic and/or hepatitis B or C liver diseases—systematic cochrane hepato-biliary group review with meta-analyses of randomized clinical trials". *Am. J. Gastroenterol.* **100** (11): 2583–91. doi:10.1111/j.1572-0241.2005.00262.x. PMID 16279916.
- [5]. Longstreth, George F.; Zieve, David (eds.) (18 October 2009). "Alcoholic Liver Disease".
- [6]. Gibson RS (2006). "Zinc: the missing link in combating micronutrient malnutrition in developing countries". *Proc NutrSoc* **65** (1):51–60. doi:10.1079/PNS2005474.PMID 16441944.
- [7]. Prasad AS (2003). "Zinc deficiency : Has been known of for 40 years but ignored by global health organisations". *BMJ* **326** (7386):409–10. doi:10.1136/bmj.326.7386.409.PMC 1125304. PMID 12595353.
- [8]. Blaylock, Russell L. (2006). *Health and nutrition secrets that can save your life*. Albuquerque, NM: Health Press. p. 395. ISBN 978-0-929173-48-1.
- [9]. **MedlinePlus Encyclopedia Magnesium in diet**
- [10]. Swaminathan, R. "Magnesium Metabolism and its Disorders". US National Library of Medicine National Institutes of Health.
- [11]. Rude RK, Shils ME. Magnesium. In: Shils ME, Shike M, Ross AC, Caballero B, Cousins RJ, eds. *Modern Nutrition in Health and Disease*. 10th ed. Baltimore: Lippincott Williams & Wilkins; 2006:223-247.
- [12]. "Iron deficiency anemia". Mayo Clinic. March 4, 2011. Retrieved December 11,2012.
- [13]. Sharma Yang Y, Sharma A, Awasthi S, Awasthi Y (2004). "Antioxidant role of glutathione S -transferases: protection against oxidant toxicity and regulation of stress-mediated apoptosis".
- [14]. Peter P. Klemchuk "Antioxidants" in *Ullmann's Encyclopedia of Industrial Chemistry*, 2000, Wiley-VCH, Weinheim. doi: 10.1002/14356007.a03\_091
- [15]. Monica Eng (7 March 2012). "Has your food gone rancid?". *Chicago Tribune*.
- [16]. Michael D. Wheeler, Ph.D. (2004). "Endotoxin and Kupffer Cell Activation in Alcoholic Liver Disease".
- [17]. "Aloe Vera: A Valuable Ingredient for the Food, Pharmaceutical and Cosmetic Industries—A Review". *Critical Reviews in Food Science and Nutrition* **44** (2): 91–96. doi:10.1080/10408690490424694. PMID 15116756.
- [18]. Barcroft and Myskja (2003) *Aloe Vera: Nature's Silent Healer*. BAAM, USA. ISBN 0-9545071-0-X
- [19]. Darokar MP, Rai R, Gupta AK, Shasany AK, Rajkumar S, Sunderasan V, Khanuja SPS (2003). "Molecular assessment of germplasm diversity in Aloe spp. using RAPD and AFLP analysis". *J Med. Arom. Plant Sci.* **25** (2): 354–361.
- [20]. Farooqi and Sreeramu (2001) *Cultivation of Medicinal and Aromatic Crops (Revised Edition)*. Orient Longman, India. p. 25.
- [21]. "Kemper Center for Home Gardening: Aloe vera". Missouri Botanic Gardens, USA. Retrieved 2008-07-11.
- [22]. Prasad, S; Aggarwal, B. B.; Benzie, I. F. F.; Wachtel-Galor, S (2011). "Turmeric, the Golden Spice: From Traditional Medicine to Modern Medicine". PMID 22593922.
- [23]. Tahira JJ et al (2010). "Weed flora of Curcuma longa". *Pakistan J Weed Sci Res* **16**(2): 241–6. Retrieved 11 October 2012.
- [24]. Chattopadhyay, Ishita; Kaushik Biswas; Uday Bandyopadhyay; Ranajit K. Banerjee (10 July 2004). "Turmeric and curcumin: Biological actions and medicinal applications". *Current Science (Indian Academy of Sciences)* **87** (1): 44–53. ISSN 0011-3891. Retrieved 16 March 2013.
- [25]. "Herbs at a Glance: Turmeric, Science & Safety". National Center for Complementary and Alternative Medicine (NCCAM), National Institutes of Health. 2012. Retrieved 11 October 2012.