Cirrhosis of liver: A novel review

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ABSTRACT

Health is a state of complete mental, social and physical well-being and not only the absence of infirmity or disease. Public health nutrition assessment helps in recognizing the people which are in need of nutrition related modernizations and also involves monitoring the effectiveness of interventions programs. Cirrhosis is defined as a chronic liver infection. It consists of deterioration of liver cells along with fibrosis and infection generating nodules. It leads to portal vein hypertension. These risk factors are for hepatitis B and C transmission. (E.g. birthplace in endemic zones, sexual history contact, intravenous drugs, accidental contamination of blood) transfusion background and private and family history of diseases. Review covers introduction, etiology, causes, risk factors and prevalence of liver cirrhosis and also its relationship with ABO Blood groups special nutritional health status in hepatic cirrhosis.

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INTRODUCTION

Health is a state of complete mental, social and physical well-being and not only the absence of infirmity or disease [1]. There are many factors that have influence on the health state of a person, but nutrition plays a vital role in promoting health, prevention from several diseases and hence improving quality of life [2]. Nutrition also accepts a fundamental part in improving the health status of a man [3]. Nutritional Health Assessment plays role in evaluating nutrition associated risks that might be involved in person’s future or current health. Nutritional health assessment is a process for nutritional care of hospitalized patients on daily basis. Public health nutrition assessment helps in recognizing the people which are in need of nutrition related modernizations and also involves monitoring the effectiveness of interventions programs. Nutritional assessment of total population can also be determined by such means in which health risk common in population group are identified, and specific policy measures can also be frame to fight them [4].

Elements of nutritional status assessment

Major elements of nutritional status assessment are ABCDs: anthropometric measurements, biochemical tests, clinical observations, dietary intake, socioeconomic factors and medical histories of a person and entire population [5]. Family history should encompass cultural background and family’s social especially diet therapy and use of corresponding medicine and unconventional [6].

Cirrhosis of liver

Cirrhosis is defined as a chronic liver infection. It consists of deterioration of liver cells along with fibrosis and infection generating nodules. It leads to portal vein hypertension. In 2001, the research shows that cirrhosis is the tenth foremost cause of death in men and twelfth forecast cause in women in US. It caused 27,000 deaths. In Pakistan cirrhosis is more dominant as compared to other developing countries [9]. Cirrhosis frequently is a silent disorder. Here patients remain asymptomatic until decompensating is reached. Doctors should question about the risk factors that effects patient to cirrhosis. The amount and the time span of drug consumption is most absolute risk factor of cirrhosis.

Risk factors

These risk factors are for hepatitis B and C transmission. (E.g. birthplace in endemic zones, sexual history contact, intravenous drugs, accidental contamination of blood) transfusion background and private and family history of diseases [10]. Early symptoms of cirrhosis cause anorexia, loss of weight, dizziness, fatigue and weakness of bones known as osteoporosis as a result of Vitamin D malabsorption and calcium deficiency. It is a decom-pensating disease so it results in complications such as ascites, hepatic encephalopathy, and variceal bleeding from vein [11].

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Causes of cirrhosis

Most common causes of the liver cirrhosis are alcohol intake (60 to 70 percent), chronic hepatitis B or C (10 percent) [10 and 12]. Both hepatitis B virus (HBV) and hepatitis C virus (HCV) are endemic in our community. Both of these viruses can lead to cirrhosis liver infection and other cirrhosis complications. It results in increased morbidity and mortality in patients [3]. HCV regarding cirrhosis is now a day is a major issue around the world [14]. Hepatitis B virus (HBV) complication is a major worldwide health problem [15] mainly in Asia, Africa, southern Europe and Latin America [16]. About 2 million people are affected with HBV globally [17] and 400 million of them are suffering from smear HBV complications [18]. Pakistan is greatly endemic with hepatitis B virus [15] its complication grade is on a sound rise. The main reasons to these complications are lack of proper health, poor economic status, less awareness about the disease including HBV, HCV and HIV [18].

The World Health Organization calculated that there are 350 million people suffering from smear HBV complication and 170 million people affected from smear HVC complications around the world [1]. HBV approximately result in 563 000 deaths and HCV results in 366 000 deaths per annum [19]. Pakistan is among the affected nations. Ascites is one of the most common infections of cirrhosis. It results in poor life standards, raise the risk of development of complications of cirrhosis, increased morbidity and mortality and renal failure [20].

Patients with ascites may have a chance of survival of 85 % and 56 % at 1 and 5 years deprived of transplantation of liver respectively [21]. Non-alcoholic fatty liver disease involves a range from simple to non-alcoholic steatohepatitis, which leads to risks of cirrhosis and type 2 diabetes. NAFLD has been identified as a major health burden as the worldwide due to sedentary lifestyle and obesity, unhealthy dietary pattern. Nutrients and dietary pattern are important supporters towards development, advancement, and cure of associated metabolic and Non-alcoholic fatty liver disease as well.

Balanced diet has benefits in weight loss on NAFLD patients. So nutrition provides a way for cure and prevention of NAFLD, patients being victims should be recommended with balanced diet [22].

In most of countries, about 3rd of population is affected with non-alcoholic fatty liver disease. Nearly 10 % and 30 % of NAFLD individuals can develop into cirrhosis. Common metabolic risk factors exist for NAFLD, showed more risks for cardiovascular death and liver related complications. There are four main focusing areas for management/ control strategies in NAFLD. Life style modification, liver-directed pharmacotherapy, managing the complications of cirrhosis and components of the metabolic syndrome [22].

Relation of blood group and disease

ABO blood group has been considered to be supplementary with the risk of numerous diseases. HBV and HCV complications are the main health problems around the world. This research is targeted to assess the ABO and Rh blood group antigens and its relationship with HBV and HCV seroactive status in donors [23]. Blood groups antigens are determined hereditary and have its role in understanding genetics, disease susceptibility and Inheritance pattern. The presence and absence of specific blood groups antigens can lead to various diseases. It was confirmed that many associations between ABO phenotypes and higher proneness of diseases.

HIV infection and Hepatitis B are such viral infections that present public health issues. To improve their control, some ideas suggest that genetic predispositions like Rh blood groups and ABO groups affect the existence of such diseases. HIV infections and Hepatitis B have similar transmission mode, both infections have various risks. Some studies reported that Rh blood groups and ABO keeps its effect on occurrence of viral diseases [24].

Worthy link has explained that blood group O is strongly co-related to peptic ulcer, and other diseases e.g. diabetes mellitus, pernicious anemia, stomach cancer and blood group A [16] association between hepatocellular carcinoma and blood group A [22]. There is a strong relationship between blood group A and hepatitis B [24]. In the discipline of Venereology and dermatology, potential relationships between blood group A and lichen planus, seborrheic dermatitis and pemphigus and blood group B, and association between vitiligo and blood group AB have been shown. [26]. Blood groups--AB and -B are linked with (HBV) hepatitis B virus [27].

Clinical presentation

The clinical symptoms may include mental status changes, gastrointestinal bleeding, increasing abdominal girth, coagulopathy and skin or eye pruritus. These symptoms are due to the result of reduced hepatocellular function with or without somatic hindrance subordinate to cirrhosis. As hepatic enzyme formation is required for medicine metabolism, high sensitivity and drug harmlessness may occur in patient diminished hepatic synthesis [28].

Etiologies of hepatic cirrhosis

Most common cause of the liver cirrhosis is alcohol intake (60 to 70 percent), biliary obstruction (5 to 10 percent), biliary atresia/neonatal hepatitis, chronic hepatitis B or C (10 percent) and hemochromatosis (5 to 10 percent) [10 and 12].

Diagnosis of cirrhosis

The patient shows with symptom of swear liver infection (e.g. drug abuse, obesity, viral hepatitis). Patient consists of secondary liver panel abnormalities (e.g. raised ALT or AST) or positive display for serologic markers of chronic liver infection. On incidental conclusions patient is suggested to routine checkups (e.g. CT, MRI ultrasonography).

Pathophysiology of ascites

The main consideration adding to ascites development is a splanchnic vasodilation bringing about a diminished arterial blood volume [29]. Expanded hepatic protection from portal flow because of cirrhosis causes slow advancement of portal hypertension and collateral vein arrangement with shunting of blood to the systemic circulation. As portal hypertension creates, splanchnic blood vessel vasodilation happens because of the upgraded local production of nitric oxide and different vasodilators (including calcitonin quality related peptide, substance P, carbon monoxide, and endogenous cannabinoids) as an outcome of endothelial extending and perhaps bacterial translocation [30].

Late investigations have given proof showing that bacterial translocation to mesenteric lymph nodes with expanded production of bacterial items and consequent stimulation of cytokine synthesis assume a vital part in the pathogenesis of arterial vasodilation and related circulatory anomalies that happen in cirrhosis. In beginning times of cirrhosis, splanchnic arterial vasodilation is direct and has no real impact on powerful arterial blood volume, which is kept normal because of an expansion in plasma volume and cardiovascular yield [29].

In advanced stages, splanchnic arterial vasodilation is intense to the point that powerful arterial blood volume turns out to be notably lessened and arterial pressure falls. A reduction in cardiovascular yield, conceivably identified with the presence of cirrhotic cardiomyopathy, happens in the late phases of cirrhosis and may also contribute to the impedance in effective arterial blood volume.
A reduction in cardiac output, possibly related to the presence of cirrhotic cardiomyopathy, occurs in the late stages of cirrhosis and may also contribute to the impairment in effective arterial blood volume [27].

Prevalence of cirrhosis

In 2001 cirrhosis liver was the tenth driving reason for death in men and twelfth for ladies in the United States bringing about around 27,000 deaths [31]. In creating nations like Pakistan cirrhosis liver is more pervasive in contrast to nations (Shams Uddin, 1998). In fact, both hepatitis B infection (HBV) and hepatitis C infection (HCV) contaminations have turned out to be endemic in our group. Both hepatitis B virus (HBV) and hepatitis C virus (HCV) are endemic in our community. Both of these viruses can lead to cirrhosis liver infection and other cirrhosis complications. It results in increased morbidity and mortality in patients [13].

HCV regarding cirrhosis is now a day is a major issue around the world [14]. Different research examinations from Pakistan show frequency of HCV infection from 0.0-20.89 % [13]. Globally there are more than 350 million of carriers of HBV infections. Among them 75 % belong to Asian continent [32]. In Pakistan the frequency of HBV in healthy donors is 2-14 %. Generally, in overall population of Pakistan the occurrence of HBV and HCV was approximated at 3.6-18.66 % and 4.25-7.13 % respectively [33]. Cirrhosis live develops in 10 to 20 % of people who take heavy drugs. In 2003, 44 % of the deaths due to cirrhosis were attributed to drugs in US [34].

In Pakistan, there are calculated 7- 9 million bearers of hepatitis B infection (HBV) with a transporter rate of 3-5 %. One hundred and six unique investigations distributed from 1998 to 2010 were incorporated into this examination. Weighted mean and standard deviation were resolved for every population gathering. The level of hepatitis B infection contamination as a rule populace was 4.3318 % ± 1.664 %, solid blood donors (3.93 % ± 1.58 %), medicinal services people (3.25 % ± 1.202 %), pregnant ladies (5.872 % ± 4.984), patients with cirrhosis (28.87 % ± 11.90 %), patients with HCC (22 % ± 2.645 %), patients with hepatitis (15.896 % ± 14.824 %), patients with liver ailments (27.54 % ± 6.385 %), various transfused patients (6.223 % ± 2.121 %), and clients of injectable medications (14.95 % ± 10.536 %) [31]. The World Health Organization calculated that there are 350 million people suffering from HBV complication and 170 million people affected from HVC complications around the world [1]. HBV approximately result in 563 000 deaths and HCV results in 366 000 deaths per annum [19].

Nutritional assessment in hepatic cirrhosis

Amodio and Bemer investigated that malnutrition is basic among patients which are experiencing hepatic cirrhosis which is important to examine pathophysiological changes in liver with respect to change in conclusion of dietary wellbeing status. Frequency of malnutrition can be evaluated among patients with liver cirrhosis, so different methods can be utilized for the assessment of nutritional health status. Frequency of malnutrition can be evaluated among patients with liver cirrhosis. There are eminent sex-related contrasts in arrangement of body and in the attributes of tissue loss process, which restrict the value of technologies which depend on estimation of muscle mass and functions in ladies. Strategies that include subjective and target factors give clear data and they are prescribed. Vitality and nitrogen necessities and in HE patients are probably not going to vary per measure viz 35-45 kcal/kg and 1.2-1.5g/kg protein every day. Little suppers consistently conveyed for the duration of the day and complex starches in late-night will help in bringing down protein usage. However, compliance is likely a problem. Diet enriched with vegetables and dairy proteins are healthy and are recommended but tolerance changes as the diet changes. Occasional patients of intolerant of dietary protein may be some times recommended with branched chain amino acids and dietary fiber. Decom-pensated cirrhotic patients are sometimes recommended with short-term multivitamins supplements. Deficiency of nitrogen may worsen the condition of HE; it must be controlled and corrected. Conclusion: Effective administration of such patients needs an integrated multidimensional intervention. However, more research is required to occupy the gaps in latest evidence base to maximize the nutritional approach of cirrhotic and HE patients [30].

Fan and Cao reported that alcoholic fatty liver disease requires a spectrum range from steatosis to non-alcoholic steatohepatitis, which leads to increased chance of type 2 diabetes, cardiovascular diseases, and cirrhosis. With the increasing risk of obesity, unhealthy dietary pattern and sedentary lifestyle NAFLD has been identified as major health problem. Nutrients and dietary patterns are important promoters in the growth, progression and cure of NAFLD and other associated metabolic comorbidities. Diet rich in trans/saturated cholesterol and fat, and fructose-sweetened beverages enhances visceral adiposity and promote hepatic lipid accumulation and passage into non-alcoholic steatohepatitis, minimizing caloric intake, elevating soy protein consumption, supplements of monounsaturated fatty acids and omega-3 fatty acids and whey proteins intake and probiotics have therapeutic and preventive influences.

Green tea, fiber, coffee, choline and light alcohol may be considered as a safety factor for patients suffering from NAFLD. 3- 5 % of weight loss, attained by hypocaloric diet or in combination with behavioral modification and exercise, lessens hepatic steatosis, and about 10 % weight loss might be helpful in improving hepatic micro-inflammation. Strictly adherence to diet, is more fruit full beyond weight loss on NAFLD patients whether of normal weight and or obese. So for treatment and prevention of NAFLD nutrition and individualized diet should be focused [22]. Dyson had carried out study that NAFLD prevails in 3rd of population in most of developed countries. About 10 % and 30 % of patients with NAFLA have non-alcoholic steatohepatitis (NASH) that can convert into cirrhosis. There exist metabolic risk factors for both CVD and as well as NAFLD, so people with NASH have more chances for cardiovascular or liver-related death. Control of NAFLD patients depends on the stage of disease, emphasizing the value of NAFLD that requires careful risk stratification.
Four main focusing area for NAFLD management interventions are: targeting the components of the metabolic syndrome, lifestyle modification and liver-directed pharmacotherapy for high risk patients and controlling the severity of cirrhosis [37]. Bemer assessed that malnutrition is common in patients with hepatic encephalopathy and end stage liver failure and is believed to be a prominent prognostic factor which affects outcome, survival and quality of life. Liver keeps its role in regulation of nutrients by involving in metabolism of nutrients, their appropriate use and distribution by the body. Consequences related to nutrition with potential to cause nervous system dysfunction occurs in liver failure and many factors involves in promoting malnutrition in hepatic failure. Inadequate dietary intake, increased protein losses, malabsorption, insulin resistance, hyper metabolism, ascites, gastrointestinal bleeding, hyponatremia and inflammation-infection. The supplementation of diet with antioxidants, amino acids and vitamins and probiotics provides protein and energy which improves nutritional status, hepatic encephalopathy, end-stage liver failure as well as liver function [35].

Ross concluded that the major cause of NAFLD is diet, but there are lacks of healthy recommendations for carriers with assured NAFLD along with weight reduction and doing physical activity. The current research work reported that opportunities might be there to provide more valuable advice for people with or at risk of NAFLD. Studies suggests that associations among whole grain consumption and reduced risk of obesity and other diseases, yet no research work has been done to study the potential of whole grains to prevent or cure the FLD [5]. Yovita concluded that there was no relation between anthropometrics measurements with Child-Pugh score, its mean anthropometrics cannot be used to study the nutritional profile of liver cirrhotic patients. But positive correlation is observed between transferrin serum, pre albumin levels with Child-Pugh values, but pre albumin and transferrin serum level is also used as a factor to diagnose the nutritional status of cirrhotic patients. No relation exists between transferrin serum level, albumin and prealbumin levels with anthropometrics in cirrhotic patients based on Child-Pugh [30].

### Case study of BMI and alcohol with cirrhosis

In this investigation of moderately aged ladies in the UK who expend low to direct measures of liquor, we found that contrasted to ladies with a body mass index between 22.5 and 25, the individuals who were overweight or fat had an expanded danger of liver cirrhosis; the hazard expanded by around 28 % for every 5-unit increment in weight file. The relative increment in the danger of liver cirrhosis was not modified by liquor utilization; notwithstanding, the outright increment in liver cirrhosis rates with expanding weight record was considerably more noteworthy in ladies who revealed that they drank 150 g or a greater amount of liquor every week (a normal of over two beverages per day) than in those detailing drinking under 70 g seven days (a normal of about a large portion of a drink a day). Over a mean of 6.2 people a long time of development, 1811 ladies had a first cirrhosis related clinic confirmation or death and 421 of these ladies had cirrhosis recorded for the first at death. The general occurrence of first clinic confirmation with or death from cirrhosis in this population was 1.2 for each 1000 ladies more than five years. On the premise of the World Health Organization’s definitions for body mass index 46 % of ladies in the examination were a healthy weight or less (weight record < 25), 36 % were overweight (25 to< 30), and 18 % were fat (≥ 30). The mean period of ladies at enlistment was 56 years, and the mean measured body mass index was 27.6 [16].

### ABO blood group system relation with liver cirrhosis

Most of the scientists and researchers around the world, conducting human studies but are not bothering about a strong biomarker that is blood group. While to be sure of accuracy in results they should know about distribution of four blood groups in different regions of the world and that variable effects of these four different blood groups may pose different errors in research if not considered [38]. Hakymez et al. (2016) inferred that Rh antigen and O blood groups in CHB patient’s cases could be a hazard for serious hepatic fibrosis and prompts cirrhosis. At the point when CHB patients alongside critical liver cirrhosis and fibrosis were determined to have regard to ABO gathering and antigen status, it was checked that O blood group demonstrated noticeable cirrhosis and fibrosis [33]. Siransy attendant that there exist no associations among Rh blood social occasions and ABO group’s viral violations like HIV sickness and hepatitis B. Regardless, notable outcomes of polluted donors were found in blood group of O. Also studies should be coordinated on connection between two factors in Côte d’Ivoire, to see the technique by which ABO antigens may impact the nearness of 2 viral abuses and to propel the search for new medicinal intercessions [24]. Lao examined the links among maternal ABO, and HBsAg carriage and rhesus (Rh) blood group phenotypes examined the daily based antenatal screening. In a retrospective work, the antenatal screening conclusions of women booked for the year 1998- 2011 in a hospital observed the relationships between HBsAg carriages among ABO with rhesus blood groups. Blood groups--AB and -B are linked with (HBV) hepatitis B virus [27].

### Summary

Health is a condition of complete mental, social and physical well-being and not merely the absence of infirmity or disease. There are many parameters that have influence on the health state of a person, but nutrition plays a key role in promoting health, prevention from several diseases and hence improving quality of life Nutritional health assessment plays a role in evaluating nutrition associated risks that might involve in person’s future or current health. Nutritional health assessment is a daily based process for nutritional care of hospitalized patients. Major component of nutritional status assessment are ABCDs: anthropometric measurements, biochemical tests, clinical observations, dietary intake, socioeconomic factors, family history and medical histories along with biomarkers i.e. Complete blood count (CBC), serum albumin, Hemo-globin, ABO group and ultrasonography. The food records are usually taken for 3- 7 days and it provides exact assessment of actual dietary intake. Socioeconomic status had a great offering in optimal nutritional life of especially school going phase.

Cirrhosis is defined as a chronic liver infection. It consists of deterioration of liver cells along with fibrosis and infection generating nodules. It leads to portal vein hypertension. It is the 12th primary cause of mortality in US. In developing nations like Pakistan cirrhosis liver is more pervasive contrasted with developed nations. Cirrhosis frequently is a silent disorder. Here patients remain asymptomatic until decompensating is reached. The amount and the time span of drug consumption is most absolute risk factor of cirrhosis. Other risk factors include those for hepatitis B and C and personal or family history of autoimmune or hepatic diseases. ABO blood group has been found to be associated with the risk of several diseases. To improve their control, some ideas suggest that genetic predispositions like Rh blood groups and ABO groups affect the existence of such diseases. The cross sectional examination configuration was research work which is used for estimation of the commonness of a disease to research the reasons for the disease, setting up links between risk factors and health results or exposures to suspected elements and its relationship to ABO blood aggregate framework, over some period, regularly years as opposed to weeks or months. A wide range of data about diet and health can be gathered. The volunteers experienced liver cirrhosis and people with no liver cirrhosis and any endless disease were incorporated into the examination.
One hundred and ninety volunteers, 95 from each gathering (95 liver cirrhosis and 95 non-liver cirrhotic volunteers) were chosen Amin Medical and Dental Care, District Chiniot, Punjab-Pakistan and District Head Quarter Hospital Chiniot city. The chosen volunteers were evaluated for their health status in connection to nutrition. Demographics, anthropometrics, blood tests, financial status, food intake and dietary patterns were autonomous factors; and physiological status (liver cirrhosis) were dependent factors while way of life example and family background were confounding factors. The dietary intake appraisal of volunteers was completed by Food Frequency Questionnaire (FFQ). The information was breaking down by utilizing R (3.2.2).

Association between gender and physiological status of volunteers showed non-significant result. Relationship between blood group and physiological status of volunteers was found to be highly significant, B positive (69.1%) and AB positive (68.9%) blood group has higher risk of liver cirrhosis. Highly-significant relation between physical activity and physiological status of volunteers, sedentary lifestyle (72.1%) was more prone to liver cirrhosis. Most of the liver cirrhosis patients (81.4%) were reported sleeping less than 6 hours. High relationship was also found between socio economic status and physiological status, about 58% (middle income) and 59% (low income) patients suffered from liver cirrhosis. 71.4% patients suffered from liver cirrhosis fall in joint family system. A significant correlation was found between physiological status with vegetable, cereals, Meat, Dairy, water intake and fats and oil. Weight loss was mostly shown in liver cirrhosis patients as compared to normal volunteers. Body Fat was found Highly Significant with respect to physiological status. It was mostly low in liver cirrhosis patients. Body Water was also found Significant with respect to physiological status. It was mostly high in liver cirrhosis patients. Muscle mass was found Highly Significant with respect to physiological status, was mostly low in liver cirrhosis patients. Bone Mass was found Non-Significant with respect to physiological status. Body Mass Index (BMI) was found Highly Significant with respect to physiological status. BMI has significant change in both groups.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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