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M.A. HOMESCIENCE - SEM-II

Therapeutic Nutrition -- CC 5

UNIT – III

Liver Diseases

Introduction

The liver is the largest gland in the body, which plays a vital role and performs many complex functions. Liver serves as body's internal chemical power plant. Liver constitutes about 3% of body's weight.27% of the total blood flow takes place in the liver.

Functions of the liver

- Liver secretes bile and takes part in metabolic processes.
- Digested amino acids are received and new proteins are synthesized by the liver.
- It is the storehouse of carbohydrate.
- Regulates the blood glucose level by converting into glycogen.
- Takes part in carbohydrate and protein metabolism.
- Triglycerides and phospholipids are synthesized in the liver.
- Filters alcohol and toxic substances from the blood and excretes them from the body.
- Regulates the functions of fat soluble vitamins.

- Stores iron, copper and other minerals for the metabolism.
- Liver plays a significant role in maintaining the osmotic pressure of blood, preventing hemorrhage and providing storage of protein.
- Phospholipids are synthesized in the liver.
- Liver is a major organ for interconversion of metabolites.

Causes of liver diseases

Following are the causes of liver diseases:

- **Infectious agents** – bacteria, viruses, parasites.
- **Toxins and toxic chemicals** - phosphorus, chloroform, carbon tetrachloride.
- Alcoholism – excessive intake of alcohol for a long period of time.
- **Metabolic factors** – impaired nutrition and malnourishment.
- **Biliary obstruction** – bile stone formation.
- **Decreased functioning cells** – due to damaged liver cells.
- **Decreased blood supply.**

Symptoms of liver diseases

Common symptoms are weakness, fatigue, anorexia, weight loss, pain in abdominal region, nausea and vomiting, enlargement of liver, edema and portal hypertension. Symptoms depend on the type and severity of disease.

Types of liver diseases

1. Jaundice
2. Hepatitis
3. Liver Cirrhosis
4. Hepatic Coma

1. **Jaundice:**

Jaundice is a symptom which denotes abnormal liver function due to disease. It is apparent from yellow pigmentation of skin and mucous membrane due to accumulation of bile pigments in the blood. Following are the types of jaundice:

- **Obstructive** – Due to obstruction of bile by stones, tumours or swelling of the mucosa of the ducts.

- **Haemolytic** – Due to yellow fever, pernicious anaemia.

- **Toxic –** Due to poisons, drugs or viral infection, protozoal infection.

Dietetic management

The aim of diet is to protect the liver from strain and to avoid further damage
These are the points which should be kept in mind while planning a diet for a jaundice patient:

- Good quality of protein should be given to regenerate tissues and prevent tissue damage.
- High carbohydrate intake is advised to spare protein and synthesis of glycogen.
- A moderate fat diet should be given.
- Vitamin supplements must be provided.
- In case of oedema, sodium restricted diet is permitted.

2. **Hepatitis**:

It is known as viral hepatitis (inflammation of the liver due to viral infection).Its common cause is jaundice. There are following types of hepatitis:

- **Viral**
  - Type A (infectious) –usually mild and rarely progresses to chronic hepatitis. It is transmitted by contaminated food and water.
  - Type B (serum) - Type B is transmitted through improperly sterilized surgical needles, mother- to-new born, unprotected sexual contacts, human bites, sharing items such as razors, tooth brushes, cloths with an infected person etc.
  - Type C (post transfusion) – Transmitted by blood transfusion. Frequently seen in male homosexual.
- **Drug- induced** – Due to addiction to alcohol, heroin or toxic substances like carbon tetrachloride, chloroform etc.

Symptoms
Anorexia, fatigue, nausea, vomiting, diarrhoea, fever, weight loss and abdominal discomfort etc.

Dietetic Management
The objective of the dietetic treatment is to avoid further injury and strain to liver and provide nutrients for regeneration of liver tissues. Modification in the dietary treatment depends on the liver damage. A high protein, high carbohydrate, moderate fat diet is recommended. Small feeding at regular intervals is suggested.
Calorie: 1500-2000 kcal should be supplied.
Protein: It varies according to severity of the condition. In severe jaundice an intake of 40 -50 gm and in mild jaundice 60-80 gm of protein is allowed. In case of hepatic coma, protein containing food is not permitted.
Carbohydrate: A high carbohydrate diet is given to supply enough calorie. A diet of 300-400gm carbohydrate is suggested.
Fat: In severe jaundice about 30 gm and in moderate jaundice 50-60 gm fat is permissible.
Vitamins: Vitamins are essential to regenerate liver cells. Multivitamin supplement is essential to meet the daily needs.
Minerals: During intravenous feeding, serum sodium and potassium levels should be maintained through supplements.

Foods included
Cereal porridges, root vegetables, fruit and fruit juice, chapattis, skimmed milk, vegetable soups, sugar, jiggery, honey and non- stimulating beverages.

Foods avoided
Pulses, beans, meat, fish, chicken, egg, soups, ghee, butter, oil bakery products, dried fruits, papad, chutney, pickles ,alcoholic beverages, fried preparation, whole milk etc.

3. Liver Cirrhosis:

Liver cirrhosis is a complication of liver due to a variety of causes leading to scarring and liver failure. The scar tissue blocks the flow of blood through the liver and slows the liver's ability to process nutrients, hormones, drugs, and natural toxins.

Causes of liver Cirrhosis

- Infectious hepatitis
- Chronic alcoholism
- Malnutrition
- Inherited disorder
- Chronic hepatitis B or C
- Biliary obstruction
- Decreased blood supply

- Metabolic disorder

Symptom: Gastro-intestinal disturbances accompanied by anorexia nausea vomiting blood, fatigue and weakness, pain and disturbance in abdomen, intense itching, redness in the palm, whitening of nails, severe muscle pain ,fever, enlarged spleen.

Dietetic Management

A high calorie, adequate protein, high carbohydrate, low fat diet with vitamin and mineral supplementation is recommended.

Calorie: 2000- 3000 kcal. is required to meet the need of energy which is necessary for regeneration of liver cells.

Protein: The protein content of the diet varies according to the symptoms. If hepatic coma accompanies, protein is restricted. Otherwise, a high protein (1-1.5 gm/kg body weight) is advisable.

Carbohydrate: Carbohydrate should be supplied liberally so that liver may store glycogen and liver function improves when the glycogen stores are adequate in liver cirrhosis.60% of calorie should come from carbohydrate so that liver damage is minimized.

Fat: The fat content of diet must be very low, less than 10gm.

Vitamins and Minerals: Multiple vitamin supplement is recommended to replenish liver stores and repair tissue damage, especially if there is anorexia. The liver is the major site of conversion of vitamins into metabolically active form. In liver cirrhosis there is deficiency of folate, vitamin A, riboflavin, vitamin D, calcium, zink, mg, vitamin B12. So, water soluble vitamins are needed.

Sodium: Sodium is restricted only if edema and ascites are present. Not more than 2 gm sodium is permitted. Take care that very less sodium increases the risk of hyponatremia.

Fluid: Fluid intake of 800-1000ml/day is required

Foods included

Cereals in soft form, fish chicken, soft cooked egg, fruit, fruit juice,light beverages

Avoided foods

Fried foods, rich desserts, strongly flavoured vegetables, nuts,milk, salads etc.

4. Hepatic Coma:

It is triggered by a buildup of toxins in the blood stream. One of the dreaded complications of the liver diseases, particularly viral hepatitis and liver cirrhosis, is hepatic coma. It occurs when the products of intestinal absorption reach the brain without being metabolized by the liver cells.

Symptoms: Severe mental confusion restlessness, hyper irritability, drowsiness, unconsciousness, hemorrhage, low blood sugar, breath has a foetid odor.

Dietetic Management: The main principle of dietetic management is to reduce protein intake to minimize ammonia production.

Calorie: 1200-1500 kcal are provided in form of carbohydrate and fat.

Protein: Avery low protein diet (20-30 gm) is permitted for few days .Protein intake is increased with the improvement of condition of the patient.

Fat: Fat is not given to a coma patient.

Carbohydrate: Carbohydrate rich diets are included liberally to provide energy.

One Day Menu Plan

Morning—tea/coffee

Breakfast—Corn flakes with skimmed milk/ toast, banana, poached egg

Mid time—orange juice

Lunch—chapattis (2),mashed potatoes, one cup moong dal, one cup rice, one cup palak curry, one cup curd

Snack—banana/soft fruit, vegetable soup

Dinner—tomato soup, chapaties(2), one cuo dal,one cup rice,one cup curd,one cup fruit salad.

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