ASSESSMENT OF CARDIAC FUNCTION IN HEPATIC ENCEPHALOPATHY

Thesis

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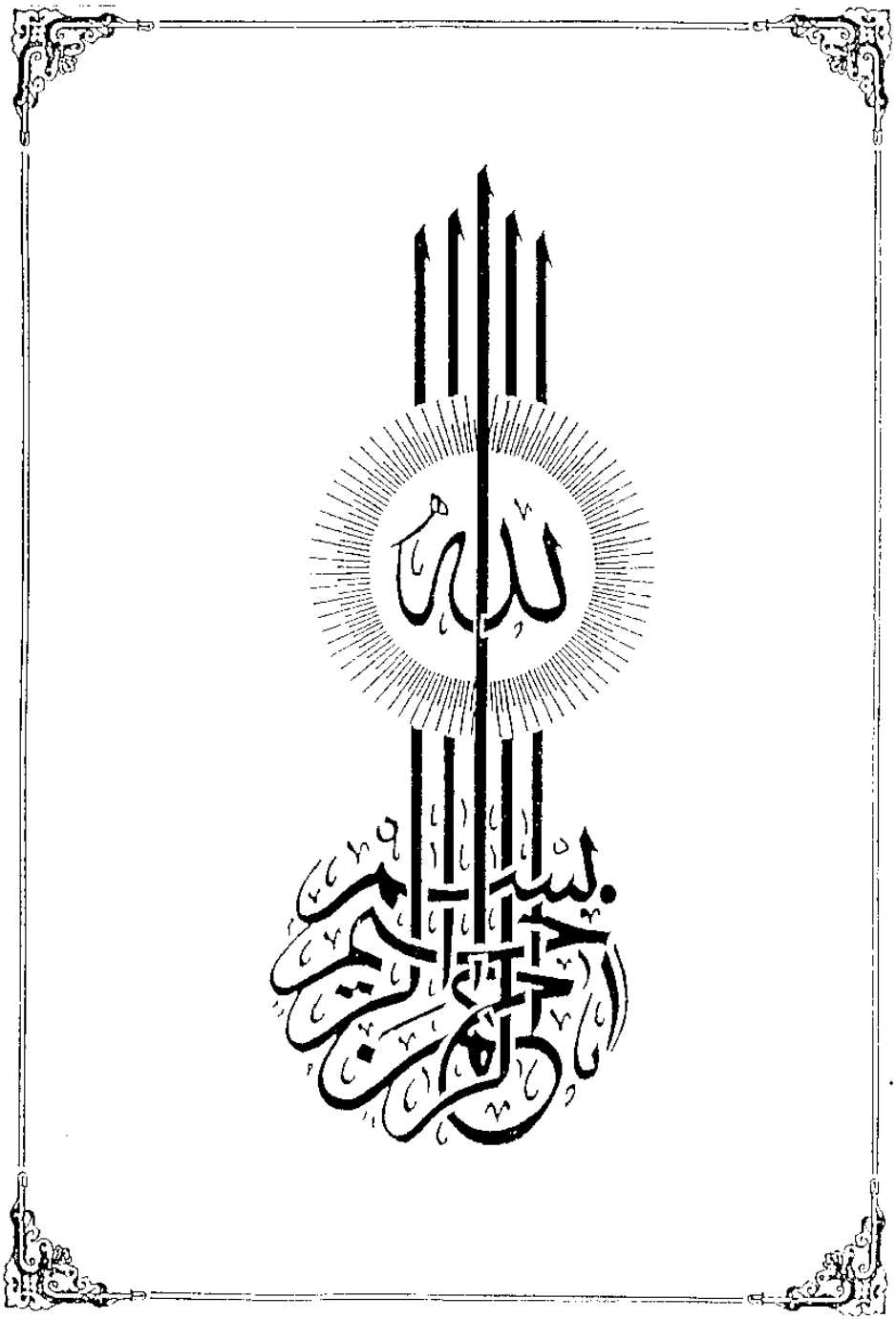

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REVIEW OF LITERATURE

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Liver Cirrhosis

Much of the confusion and controversy about the definition of cirrhosis comes from the almost uncontrollable compulsion of the definers of cirrhosis to include various aspects of pathogenesis, which is even less well understood than the definition (*Conn 1982*).

Cirrhosis is a chronic disease of the liver in which diffuse destruction and regeneration of hepatic parenchymal cells had occured and in which a diffuse increase in connective tissue had resulted in disorganization of the lobular and vascular architecture. (*Conn 1982*).

Cirrhosis is defined anatomically as a diffuse process of fibrosis and nodules formation (*Anthony et al.,1978*).

In liver disease particularly in the alcoholic, the liver microcirculation may be altered by collagenization of the space of Disse, formation of basal lamina beneath the endothelium and modification of the endothelial fenestrations (*Horn T.et al.,1987*)..

Functional studies of blood flow have confirmed the existence of these shunts (*Gross and Perrier 1975*) and also roughly that 20% of hepatic arterial blood flow is shunted through the liver although over 50% may be shunted in individual examples (*Grossmanne et al.,1977*).

When these collaterals are established, up to 80% of blood from portal venous bed may never enter the liver (*Millward ; Sadler and Wright, 1979*).

Production of cirrhosis :

The responses of the liver to necrosis are strictly limited; the most important are collapse of hepatic lobules, formation of diffuse fibrous septa and nodular regrowth of liver cells.

Necrosis may no longer be apparent by the time the cirrhotic liver is examined.

Fibrosis follows hepatocellular necrosis and this may be piecemeal in rappaport's zone 1 leading to portal-portal fibrous bridges. (*Bjorneboe M.et al.,1972*).

Confluent Necrosis is zone 3 leads to centro-portal briging and fibrosis, spotty necrosis is followed by focal necrosis and will be followed by nodules which disturb the hepatic architecture and a full cirrhosis has developed.

Sinusoids persist at the periphery of the regenerating nodules at the site of the portal central bridges.

Portal blood is diverted pas functioning liver tissue leading to vascular insufficiency at the centre of the nodules (zone 3) and even to persistance of the cirrhosis after the initial causative injury has been controlled.

CLASSIFICATION OF CIRRHOSIS

1- Morphological classification :-

3 Anatomical types are recognized :-

(A) Micronodular : is characterized by thick, regular septa, regenerating small nodule varying little in size and by involvement of every lobule. The microdular liver may represent impaired capacity for regrowth as in alcoholism, malnutrition, old age or anaemia. (*Sherlock Sh. et al.,1993*).

(B) Macronodular : is characterized by septa and nodules of variables sizes and by normal lobules in the large nodules. Previous collapse is shown by juxtaposite in the fibrous scars of three or more portal tracts. Regeneration is reflected by large cells with large nuclei and by cell plates of varying thickness. (*Sherlock Sh. et al.,1993*).

(C) Mixed : Regeneration in micronodular cirrhosis result in a macronodular or mixed appearance and with time micronodular cirrhosis after converts to macronodular (*FauerHoldt et al., 1983*).

2- Etiological :-

The following are usualiy accepted :-

1. Viral hepatitis types B ; + Delta ;HCV ; Non A, Non B.
2. Alcohol.
3. Metabolic.
   - Haemochromatosis.
   - Wilson's disease.
   - α_1 Antitrypsin deficiency.
   - Diabetes Mellitus.
   - Types IV Glycogenosis.
   - Galactosaemia.
   - Congenital Tyrosinosis.
   - Erythropoietic protoporphyria.
   - Hereditary Frutose Intolerance.
4. Drugs and toxins : -
   - Methyl dopa.
   - Methotrexate.
   - Isoniozide.
   - Perhexilline Maleate.
   - Amoidarone.
   - Oxyphenisten.
5. Infestation : -
   - Schistosomiasis.
6. Biliary obstruction : -

- Chronic Pancreatitis.
- Common duct stone.
- Stricture.
- Cystic fibrosis.
- Sclerosing cholangitis.

7. Cardiovascular : -
   - Chronic Rt sided heart failure.
   - Budd chiari syndrome.
   - Veno-occlusion disease.
8. Miscellaneous : -
   - Chronic active hepatitis.
   - Primary biliary cirrhosis.
   - Sarcoidosis.
   - Jejunoidal bypass.
   - Neonatal Hepatitis.
   - Disturbed Immunity (Lupoid Hepatitis).
9. Cyptogenic (*Boyer et al., 1988*).

Major Sequalae of cirrhosis : -

The clinical course of patients with advanced liver cirrhosis is usually complicated by a number of important sequalae which are independant on the aetiology of underlying liver disease.

The relative frequency of these complications in the different forms of cirrhosis is difficult to determine. In partly depends on the stage of the disease at which comparisons are made. (*Millward-Sadler and Wright, 1979*).

The complications include portal hypertension and its Sequaelae, Ascites, Hepatic encephalopathy. Hepatorenal syndrome, hepatocellular carcinoma.(*Daniel and Isselbacher, 1987*).

(1) Portal Hypertension :-

Portal blood flow in man is about 1000-1200 ml/minute and portal vein contributes to 72% of total

oxygen supply to the liver, and portal pressure is about 7 mm Hg in normal man, normally 100% of portal venous blood can be recovered from hepatic veins whereas in cirrhosis only 13% is obtained (*McIndoe 1950*).

Portal hypertension results from increased resistance to portal blood flow. Because portal venous system lacks valves, resistance at any level between the heart and splenchnic vessels, results in retrograde transmission of an elevated pressre.(*Daniel and Isselbacher, 1987*).

Since portal hypertension may be present in the absence of clinical findings, it may be detected only by measurement of pressure in the portal venous system. (*Boyer 1988*).

Bleeding oesophageal varices and ascites are the most serious complications of portal hypertension.

The prediction of when oseophageal varices will bleed and why is difficult, the larger the varices, the more likely are they to bleed. Intravariceal pressure is

less important although a portal pressure above 12 mm Hg appears necessary for varices to form and subsequently bleed (*Garcia - Tsao., 1987*).

Oseophagitis and reflux play little if present (*Ponce J.et al.,1981*).

Endoscopic appearances of reddness and cherry red spots on the mucosa over the varices may suggest that rupture is imminenant. The appearances may be due to intraepithelial blood filled channels (*Spence RAJ et al.,1983*).

Bleeding varices in cirrhosis have an injurious effects on the liver cells and this is due to diminished hepatic oxygen supply or to increased metabolic demands resulting from protein catabolism following haemorrhage.

The fall in blood pressure diminishes hepatic arterial flow and necrosis may ensue.

The increased absorption of nitrogen from the intestine after bleeding leads to hepatic coma.(*Sherlock S. 1993*).

(2) Ascites :-

Many factors are involved in the mechanism of ascites formation. Portal venous pressure is not so directly related to ascites. Patients with obstructed portal veins but a normal liver rarely suffer from ascites unless there is coincident. Gastrointestinal haemorrhage or if for some other reason the plasma protein level falls. (*Webb L. & Sherlock S. 1979*).

Many factors are involved in the mechanism of ascites formation. The two most important factors are failure of the liver to synthesize albumin and hence a lowered plasma osmotic pressure and portal venous hypertension : more fluid enters the peritoneal cavity than leaves it and ascites develops. This result in depletion of the effective intravascular volume and