INTRODUCTION

1. OVER VIEW

Human body is composed of delicate, contiguous, organ systems. In the healthy state of body, there is complete harmony between structure and functioning among organs, hence, in organ systems.

An acute disorder temporarily malalign the functioning of an organ system and its interrelated body parts without having any permanent effect on the structure of organs. Acute viral infection of upper respiratory tract, produces signs and symptoms for the short period, thereafter, body comes to the healthy state. On the contrary, the chronic disease has its effects on body organs in terms of structure and functions.

The repercussion of a chronic disorder is evident, both, in the organ system, in which a disease starts as well as in the correlated organ system. Chronic Gastro-esophageal reflex disease, exhibits long lasting ramifications in the gastrointestinal system and also in the oral tissues due to acidic regurgitation.
2. CATEGORIES OF LIVER DISEASES
Liver is the largest organ of human body having reddish brown colour. It weighs about 1-1.5 kg in adult human. It is a versatile organ involved in metabolism of protein, carbohydrate and lipid, along with various other types of functions. Liver performs secretory function, in addition to earlier said functions. It secretes bile containing bile salts and bile pigments. Liver metabolises ammonia into urea by ornithine cycle and helps in excretion of toxic products from body (Chatterjee, 2002).

Liver diseases, in general, can be classified into three categories.

1. **Hepatocellular** This category, encompasses diseases like viral hepatitis, alcoholic hepatitis, drug induced hepatitis etc. Hepatocellular diseases show the features of liver injury and necrosis.

2. **Cholestatic (obstructive)** The feature of bile flow obstruction predominates in this group of diseases, as in gall stone, malignancy and primary biliary cirrhosis.

3. **Mixed type** The features of above two categories of diseases are present in this category (Ghani, 2008).

3. ROLE OF KIDNEYS IN OSMOREGULATION IN HEALTHY STATE OF BODY
Kidneys are located retroperitoneally, in the upper dorsal region of the abdominal cavity on either side of the vertebral column, in human body. Each kidney is comprised of about 1.3 million of the nephrons as basic functional units (Jain, 2005). The kidneys perform the excretory as well as osmoregulatory functions in the body. Kidneys help to maintain the internal environment of the body in the constant state, Homeostasis (Deb, 2004).

**The body fluid is comprised of ICF and ECF.**

In the healthy state of body, extra cellular fluid volume is regulated by kidneys, endocrine system and nervous system in a coordinated manner.

- In the condition of excess of water in body fluid, the osmolality of plasma and ECF are lowered, blood volume increased, consequently, the osmotic pressure of blood is decreased. The osmoreceptors in hypothalamus are depressed, along with inhibition of ADH secretion from posterior pituitary gland. The reabsorption of water
from collecting tubules and DCT is decreased. The excess of water is excreted, so the outgoing urine becomes hypotonic and its volume rises. This event, helps to normalise the osmotic pressure of blood (Schrier, 1992).

- In the condition of deficiency of water in body, like, excessive sweating, profuse bleeding and starvation, the total body sodium exceeds the total body water. The plasma osmolality↑, thus, ECF volume is decreased. The osmotic pressure of blood rises. The ADH secretion is enhanced through hypothalamic osmoreceptors stimulation. Water is reabsorbed by collecting tubules and DCT. This event, helps to conserve body water and the outgoing urine becomes hypertonic and hypovolumic (Abraham & Schrier, 1994).

4. ROLE OF RENIN-ANGIOTENSIN-ALDOSTERONE SYSTEM
The renin angiotensinogen system was explained by Tigerstadt and Bergman in 1898. This system operates as shown in flow chart diagram.

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DECREASE IN CIRCULATORY BLOOD VOLUME
↓
RENAL HYPOPERFUSION
↓
STIMULATION OF JUXTAGLOMERULAR CELLS
↓
SECRETION OF RENIN
↓
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ANGIOTENSINOGEN (Plasma proteins)

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ANGIOTENSIN I ⇔ ANGIOTENSIN II ⇔ ADRENAL CORTEX

\[ \downarrow \]

ALDOSTERONE

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REABSORPTION OF SODIUM FROM NEPHRITIC FILTRATE

\[ \downarrow \]

BLOOD VOLUME INCREASES

(1. FLOW CHART OF ROLE OF RENIN ANGIOTENSIN ALDOSTERONE SYSTEM )

5. ROLE OF ATRIAL NATRIURETIC PEPTIDES

ANP is the peptide hormone, secreted by the smooth muscles of wall of atria of heart. It is released in response to blood volume expansion. It is antagonistic to RAAS. It is a direct vasodilator and lowers the systemic blood pressure. Secondarily, it increases the urinary excretion of sodium and water by inhibiting the release of renin and aldosterone.

6. ROLE OF KIDNEYS IN OSMOREGULATION IN UNHEALTHY STATE

In the unhealthy state of body:

The kidneys continue to retain water and sodium, despite, the presence of extra cellular fluid volume expansion. Although, the integrity of kidneys as the ECF volume controlling organ, is intact. The defect lies in the abnormal structure and functioning of liver. Moreover, if the transplantation of liver is done in such ascites cirrhotic patients, the sodium and water retaining tendency of kidneys is terminated (Poole et al., 2005). This fact indicates that the kidneys respond to extrarenal stimuli from blood volume regulatory system (Schrier, 1990).
7. NEED AND SCOPE OF STUDY

1. In day to day clinical practice, physicians and surgeons come across patients with different ailments. The patients with compromised Liver and Renal functions may present perplexing moments for doctors to decide about the dose of drug, nature of drug, safety of drug, safety of anesthetics to be used and the protocol to be followed to handle bleeding tendency in these patients.

The undertaken study, helped evaluate the renal function in patients with liver diseases.

2. Previously, very few studies were conducted to assess the biochemical parameters in different liver disorders and their covariation in renal dysfunction, if any.

The present study evaluated the correlation between the above said parameters. This would help predict the prognosis of the disease.

3. There was no study undertaken in the region of Bhatinda (Punjab), to assess the biochemical markers of liver and renal functions in healthy and diseased individuals. Bhatinda is a city with a population of mixed culture. Varied multi speciality and superspeciality medical centres cater to the medical needs of people.

This study, provided values of renal and liver biochemical markers in healthy and liver disease patients.

4. There was an urgent need to have a reference range of biomarkers of liver and renal functions in this region.

The undertaken study provided reference range of liver and renal biomarkers in healthy individuals. Further, it provided the prevalence of modes of viral hepatitis and prevalence of modes of cirrhosis in the region of bathinda.

5. The study provided the prevalence of renal dysfunction in patients suffering from liver diseases in the population of bathinda.

8. AIM AND OBJECTIVES

AIM
The overall aim of the present study was to assess renal function in patients with liver diseases.

OBJECTIVES
The following objectives were fulfilled by the present study.
1. Assessment of Glomerular filtration rate of patients with liver diseases.
2. Estimation of Serum Creatinine of patients with liver diseases.
3. Assessment of Blood urea nitrogen of patients with liver diseases.
4. Evaluation of Blood urea nitrogen (BUN) to Creatinine ratio (BUN/C) of patients with liver disorders.
5. Estimation of Serum Electrolytes of liver disease patients.
6. Assessment of liver functions by assaying biochemical parameters as serum bilirubin, serum albumin, serum aminotransferases, serum prothrombin, INR and haemoglobin.