DERANGEMENTS OF LIVER FUNCTION TESTS AMONG PATIENTS PRESENTING IN OUTDOOR DEPARTMENT

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ABSTRACT:
Liver function tests, also referred to as a hepatic panel, are groups of blood tests that provide information about the state of a patient’s liver. These tests include prothrombin time (PT/INR), activated Partial Thromboplastin Time (aPTT), albumin, bilirubin (direct and indirect), and others. This cross-sectional study was conducted among the patients presenting in outdoor department of different hospitals. Name, age, gender, and disease of presentation were noted on a predefined proforma. Liver function tests data of all the patients were collected from the Lab. All the data was entered and analyzed with SPSS Ver. 23.0. There were 50 patients included in this study i.e., 25 males (50%) and 25 females (50%). The mean age of the patients was 35.12±4.21 years. The minimum age was 26 years and maximum age was 41 years. Out of 50 patients six patients had deranged liver function tests. Further investigations for these patients were advised.

KEYWORDS: LIVER FUNCTION TESTS
INTRODUCTION:
Liver function tests, also referred to as a hepatic panel, are groups of blood tests that provide information about the state of a patient’s liver. These tests include prothrombin time (PT/INR), activated Partial Thromboplastin Time (aPTT), albumin, bilirubin (direct and indirect), and others. The liver transaminases aspartate transaminase (AST or SGOT) and alanine transaminase (ALT or SGPT) are useful biomarkers of liver injury in a patient with some degree of intact liver function. Most liver diseases cause only mild symptoms initially, but these diseases must be detected early. Hepatic (liver) involvement in some diseases can be of crucial importance. This testing is performed on a patient’s blood sample. Some tests are associated with functionality (e.g., albumin), some with cellular integrity (e.g., transaminase), and some with conditions linked to the biliary tract (gamma-glutamyl transferase and alkaline phosphatase). Because some of these tests do not measure function, it is more accurate to call these liver chemistries or liver tests rather than liver function tests. Several biochemical tests are useful in the evaluation and management of patients with hepatic dysfunction. These tests can be used to detect the presence of liver disease, distinguish among different types of liver disorders, gauge the extent of known liver damage, and monitor the response to treatment. Some or all of these measurements are also carried out (usually about twice a year for routine cases) on those individuals taking certain medications, such as anticonvulsants, to ensure that the medications are not adversely impacting the person’s liver.
Although example reference ranges are given, these will vary depending on age, gender and his/her health, ethnicity, method of analysis, and units of measurement. Individual results should always be interpreted using the reference range provided by the laboratory that performed the test. Measurement of total bilirubin includes both unconjugated (indirect) and conjugated (direct) bilirubin. Unconjugated bilirubin is a breakdown product of heme (a part of hemoglobin in red blood cells). The liver is responsible for clearing the blood of unconjugated bilirubin, by ‘conjugating’ it (modified to
make it water-soluble) through an enzyme named UDP-glucuronyl-transferase. When the total bilirubin level exceeds 17 μmol/l, it indicates liver disease. When total bilirubin levels exceed 40 μmol/l, bilirubin deposition at the sclera, skin, and mucous membranes will give these areas a yellow colour, thus it is called jaundice. The increase in predominantly unconjugated bilirubin is due to overproduction, reduced hepatic uptake of the unconjugated bilirubin and reduced conjugation of bilirubin. Overproduction can be due to the reabsorption of a haematoma and ineffective erythropoiesis leading to increased red blood cell destruction. Gilbert's syndrome and Crigler-Najjar syndrome have defects in the UDP-glucuronyl-transferase enzyme, affecting bilirubin conjugation (1-3). The objective of this study was to see the derangements of liver function tests among patients presenting in outdoor department.

MATERIAL AND METHODS:
This cross-sectional study was conducted among the patients presenting in outdoor department of different hospitals. Name, age, gender, and disease of presentation were noted on a predefined proforma. Liver function tests data of all the patients were collected from the Lab. All the data was entered and analyzed with SPSS Ver. 23.0. The quantitative variables were presented as mean and standard deviation. The qualitative variables were presented as frequency and percentages.

RESULTS:
There were 50 patients included in this study i.e., 25 males (50%) and 25 females (50%). The mean age of the patients was 35.12±4.21 years. The minimum age was 26 years and maximum age was 41 years. Out of 50 patients six patients had deranged liver function tests. Further investigations for these patients were advised.

DISCUSSION:
The degree of rise in conjugated bilirubin is directly proportional to the degree of hepatocyte injury. Viral hepatitis can also cause the rise in conjugated bilirubin. In parenchymal liver disease and incomplete extrahepatic obstruction, the rise in conjugated bilirubin is less than the complete common bile duct obstruction due to malignant causes. In Dubin–Johnson syndrome, a mutation in multiple drug-resistance protein 2 (MRP2) causes a rise in conjugated bilirubin.

In acute appendicitis, total bilirubin can rise from 20.52 μmol/l to 143 μmol/l. In pregnant women, the total bilirubin level is low in all three trimesters.

The measurement of bilirubin levels in the newborns is done through the use of bilimeter or transcutaneous bilirubinometer instead of performing LFTs. When the total serum bilirubin increases over 95th percentile for age during the first week of life for high risk babies, it is known as hyperbilirubinemia of the newborn (neonatal jaundice) and requires light therapy to reduce the amount of bilirubin in the blood. Pathological jaundice in newborns should be suspected when the serum bilirubin level rises by more than 5 mg/dL per day, serum bilirubin more than the physiological range, clinical jaundice more than 2 weeks, and conjugated bilirubin (dark urine staining clothes). Haemolytic jaundice is the commonest cause of pathological jaundice.

Apart from being found in high concentrations in the liver, ALT is found in the kidneys, heart, and muscles. It catalyses the transamination reaction, and only exists in a cytoplasmic form. Any kind of liver injury can cause a rise in ALT. A rise of up to 300 IU/L is not specific to the liver, but can be due to the damage of other organs such as the kidneys or muscles. When ALT rises to more than 500 IU/L, causes are usually from the liver. It can be due to hepatitis, ischemic liver injury, and toxins that causes liver damage. The ALT levels in Hepatitis C rises more than in Hepatitis A and B. Persistent ALT elevation more than 6 months is known as chronic hepatitis. Alcoholic liver disease, Non-alcoholic fatty liver disease (NAFLD), fat accumulation in liver during childhood obesity, steatohepatitis (inflammation of fatty liver disease)
are associated with a rise in ALT. Rise in ALT is also associated with reduced insulin response, reduced glucose tolerance, and increased free fatty acids and triglycerides. Bright liver syndrome (bright liver on ultrasound suggestive of fatty liver) with raised ALT is suggestive of metabolic syndrome.

In pregnancy, ALT levels would rise during the second trimester. In one of the studies, measured ALT levels in pregnancy-related conditions such as hyperemesis gravidarum was 103.5 IU/L, pre-eclampsia was 115, HELLP syndrome was 149. ALT levels would reduce by greater than 50% in three days after child delivery. Another study also shows that caffeine consumption can reduce the risk of ALT elevation in those who consume alcohol, overweight people, impaired glucose metabolism, and viral hepatitis (4-6).

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