

# Variation of PT INR in Liver Diseases

Amala T<sup>1</sup>, Sahadiya Shabni K<sup>2</sup>

<sup>1</sup>Research Scholar, Srinivas University, Mangalore, Karnataka, India Ph: +91-7025268420

**Abstract:** Liver disease also called hepatic disease is a group of disease which can lead to cirrhosis and ultimately resulting in liver failure. Liver function test are group of blood test that give information about the patient liver status. 50 blood samples of various liver disease were collected and analyzed for PT INR. From the present study PT is increased in both male and female in all liver disease. But female have comparatively higher value than male, while comparing with other liver disease more variation is seen in acute liver disease and less variation observed in fatty liver.

**Keywords:** PT-Prothrombin Time, APTT-Activated Partial Thromboplastin Time, INR-International Normalized Ratio, LFT-Liver Function Test

## 1. Introduction

Liver disease is a broad term describing any single number of diseases affecting the liver. It is accompanied by jaundice caused by increased levels of bilirubin.

There are many types of liver disease; hepatitis is the inflammation of the liver caused mainly by various viruses but also auto immunity and hereditary condition. Other can be result of drugs, poisons or drinking too much alcohol can cause cirrhosis.

Liver cirrhosis is a chronic progressive disease of the liver characterized by diffused damage to cell with fibrosis and nodular regeneration. Hepatitis is the inflammation of liver caused by immune response against liver parenchyma induced by viral infections.

Prothrombin is one of the clotting factors made by liver. Vitamin K is needed to make prothrombin and other clotting factors. Vitamin K is of greatest value in correcting the abnormal blood coagulation due to hypoprothrombinemia as a result of obstructive jaundice or biliary fistulas. So in liver disease there is an alteration of PT occur.

Prothrombin time (PT) is the time takes plasma to clot after the addition of tissue factor (obtained from animals such as rabbits or recombinant tissue factor or from brains of autopsy patient). This measures the quality of the extrinsic pathway of coagulation. Extrinsic pathway is greatly affected by levels of functional factor VII in the body. It requires vitamin K. The prothrombin time (PT) prolonged as a result of deficiencies in vitamin K and liver diseases. To conclude prothrombin time is associated with various liver disease.

## 2. Method

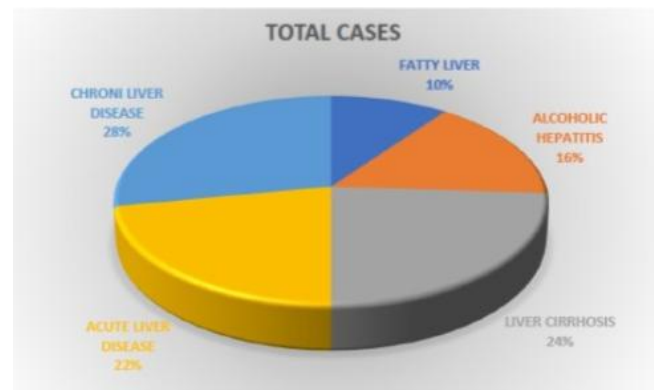
This study was conducted in department of pathology. Total 50 samples (5 fatty liver patients, 8 alcoholic hepatitis patients, 12 Liver Cirrhosis patients, 11 acute liver disease patients and 14 chronic liver disease patients) were analysed. Blood samples were collected by venipuncture into a citrated anticoagulant tube in ratio 1: 9 and centrifuged for separation of plasma. Haemolysed samples were excluded as it interferes with the test result. The KC4 Delta Coagulation Analyser is a semi-automated mechanical

clot detection system designed for the determination of prothrombin times (PT), activated partial thromboplastin times (APTT), fibrinogen concentrations determined by Clauss methodology, and other clotting assays.

## 3. Result

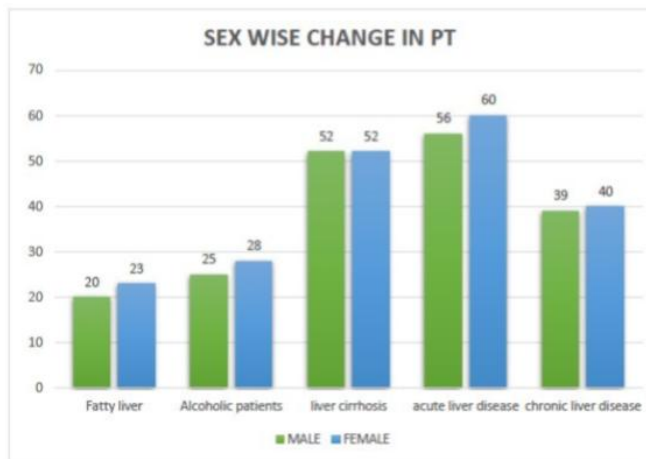
### Total population

| Cases                 | No. of Cases |
|-----------------------|--------------|
| Fatty liver           | 5            |
| Alcoholic hepatitis   | 8            |
| Liver cirrhosis       | 12           |
| Acute liver disease   | 11           |
| Chronic liver disease | 14           |
| TOTAL                 | 50           |



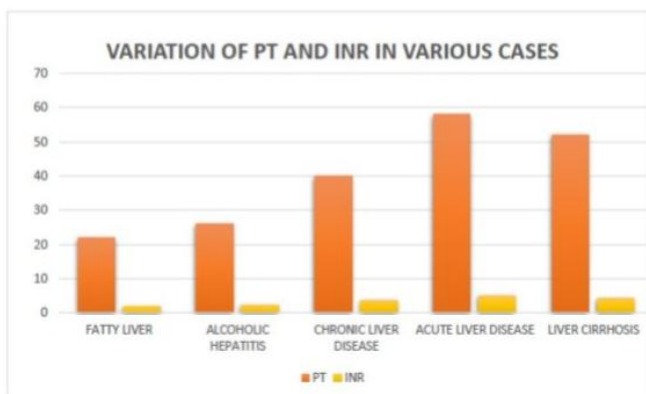
### Mean value of PT in male and female

| Case                  | Male (sec) | Female (sec) |
|-----------------------|------------|--------------|
| Fatty liver           | 20         | 23           |
| Alcoholic hepatitis   | 25         | 28           |
| Chronic liver disease | 39         | 40           |
| Acute liver disease   | 56         | 60           |
| Liver cirrhosis       | 52         | 52           |



**Mean value of PT and INR in various liver diseases**

| Cases                 | Mean PT ( sec ) | Mean INR |
|-----------------------|-----------------|----------|
| Fatty liver           | 22              | 2        |
| Alcoholic patients    | 26              | 2.2      |
| Chronic liver disease | 40              | 3.6      |
| Acute liver disease   | 58              | 4.9      |
| Liver cirrhosis       | 52              | 4.2      |



**4.Conclusion**

This prospective study found that PT/INR level is an important factor in various types of liver diseases. In normal individuals the value of PT is 12.6 to 15 seconds. Among liver diseases patients PT was higher in females when compared to males. PT is an important factor in liver function test. In most of the cases of liver diseases, the PT is prolonged and significantly higher values are observed in acute liver failure. The PT is also prolonged in liver cirrhosis. The mean value of PT in acute liver failure is 58 seconds and in liver cirrhosis is 52 seconds. The INR is also elevated in acute liver failure. In chronic liver failure and alcoholic hepatitis, the PT also prolonged. Mean PT value in chronic liver failure is 40 seconds and in alcoholic hepatitis is 26 seconds. Comparatively lower value is seen in fatty liver is 22 seconds. The present study show that PT/INR have very much importance for diagnosis of liver diseases, and it have a greater utility for detecting acute liver failure and other liver disease. It would also be helpful to incorporate coagulation screening as a routine investigation for the better management of acute liver disease patients.

**Reference**

- [1] Matthew Hoffman, MD Medically Reviewed by Carol DerSarkissian, MD on June 23, 2021
- [2] Wiesner R, Edwards E, Freeman R, Harper A, Kim R, Kamath P, et al. United Network for Organ Sharing Liver Disease Severity Score Commit-tee. Model for end-stage liver disease (MELD) and allocation of donor liver. Gastroenterology 2003; 124: 91-96.
- [3] Wilson TR. The ABCs of hepatitis. Nurse Pract.2005 Jun; 30 (6): 12-21, quiz 22-3. [PubMed]
- [4] Hosseini N, Shor J, Szabo G. Alcoholic Hepatitis: A Review. Alcohol Alcohol.2019 Jul 01; 54 (4): 408-416. [PMC free article] [PubMed]
- [5] Crabb DW, Im GY, Szabo G, Mellinger JL, Lucey MR. Diagnosis and Treatment of Alcohol-Associated Liver Diseases: 2019 Practice Guidance From the American Association for the Study of Liver Diseases. Hepatology.2020 Jan; 71 (1): 306-333. [PubMed]
- [7] Katarey D, Verma S. Drug-induced liver injury. Clin Med (Lond).2016 Dec; 16 (Suppl 6): s104-s109. [PMC free article] [PubMed]