Clinico-pathological profile of hepatic involvement in type 2 diabetes mellitus patients attending tertiary care hospital in Maharashtra

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Introduction
Liver is the principle organ for degradation of insulin. In type 2 diabetes mellitus spectrum of liver changes occurs from simple steatosis (NAFL), non-alcoholic steatohepatitis (NASH), cirrhosis to hepatocellular carcinoma. These diseases are included in common entity as non-alcoholic fatty liver disease (NAFLD).² Most of the patients with type 2 diabetes mellitus have clinical characteristics of insulin resistance syndrome including obesity (visceral fat), hypertension, glucose intolerance and typically dyslipidemia. This obesity and insulin resistance have been strongly associated with NAFLD. In most of instances NAFLD is silent disease so it is very much difficult to diagnose in early stages. NAFLD progresses very slowly however in 20% it progresses rapidly. Progression in NAFL to fibrosis stage 1 is every 14 years and every 7 years in NASH which is further increases in the presence of arterial hypertension. Cirrhosis and liver failure occurs in 11% to 20% NASH patients over 10 to 15 years³. There is 2.2 fold increases in overall mortality in NAFLD with the most common cause of death being cardiovascular diseases. Patient with NASH have an increased liver related mortality rate with decompensated liver failure and HCC corresponding to 2%. The mortality rate of type 2 diabetes mellitus patients due to cirrhosis is more than twice the general population, further more they tend to have poor prognosis with high rate of cirrhosis and mortality³. In the modern era of metabolic syndrome as obesity and type 2 diabetes mellitus epidemic is growing NASH prevalence is also increasing from 30% to 60% in western population. It is expected to become leading cause of liver transplant by 2020⁴. In India also prevalence is also found to be around 60% in many studies. Thus for the diagnosis of NAFLD requires high index of suspicion particularly in obese patient over age of 45 years with history of type 2 diabetes mellitus.

Present study was conducted to determine the Clinico-pathological profile of hepatic involvement in type 2 diabetes mellitus patients attending medicine opd at tertiary care hospital in Maharashtra.

Material and Method
In this prospective study, a total of 150 patients with T2DM study population was included the age group of 20-70 years, attending medical outpatient clinic from January 2018 to January 2019. A complete history taking and physical examination...
of type 2 diabetes mellitus patients attending medicine OPD were performed. Approval from the Institutional Ethics Committee and informed consent from the patients taken. Physical measurement such as waist circumference, body mass index and metabolic parameters such as fasting and postprandial blood sugar, glycosylated haemoglobin (HbA1c), serum uric acid, blood urea, serum creatinine, fasting lipid profile, serum bilirubin, serum glutamic oxaloacetic transaminase (SGOT), serum glutamic pyruvic transaminase (SGPT) and serum alkaline phosphatase (SAP) were measured. The patients who agreed for the participation in the study were screened by the USG abdomen with high resolution B mode system. On the basis of the USG abdomen and pelvis patients were stratified in the stage 1, stage 2, stage 3 according to mild moderate and severe steatosis. Though for a precise diagnosis of NAFLD liver biopsy is the investigation of choice the sensitivity of USG in detection of hepatic steatosis ranges from 60 to 94 % and specificity ranges from 84 to 95%.

Patients with chronic alcohol consumption, chronic liver disease due to any other aetiology were excluded.

Statistical analysis: Data documented and analysed using Statistical Package for Social Sciences [SPSS], Pearson’s Chi Square Analysis test and Fisher exact probability test. Mean and standard deviation were calculated for each variable. The diabetic patients with fatty liver were compared with the diabetic patients without fatty liver.

Results
Total 150 patients with T2DM were recruited and their baseline characteristics are summarised in the following tables:

Table 1 Overall most of the patients were predominantly obese accounting for 65%.

| Obese | Non-obese | Total |
|-------|-----------|-------|
| 98 (65%) | 52 (35%) | 150 |

The male and female patient was found to have equal prevalence of NAFLD. Mostly the patients 38% were in the age group of 40 to 49 years.

Table 2 sex distribution

| Sex   | NAFLD | NON-FALD | TOTAL |
|-------|-------|----------|-------|
| MALE  | 40 (57%) | 30 (43%) | 70 |
| FEMALE| 47 (59%) | 33 (41%) | 80 |

Discussion
The occurrence of NAFLD is 9 to 40 % in the Asian countries. In Our study the prevalence found to be 58 % which is similar to the study done by Gupte et al (65.5%)

Another Indian study done by the Chandel k et al showed nearly equal incidence of NAFLD in male and female patient similar to our study

Table 4 Population wise variables in respect to NAFLD with type2 DM

| variable                        | NAFLD | NON-NAFLD | P VALUE |
|---------------------------------|-------|-----------|---------|
| AGE (Mean±SD)                   | 40-49 years | 40-49 years | NS      |
| FASTING BSL (Mean±SD)           | 160   | 100       | 0.004   |
| HbA1c (Mean±SD)                 | 9     | 7         | <0.0001 |
| DM duration in years (Mean±SD)  | 8     | 2         | <0.0001 |
| Systolic BP (Mean±SD)           | 128   | 138       | 0.02    |
| Diastolic BP (Mean±SD)          | 78    | 76        | 0.78    |
| OHA use (Mean±SD)               | 92%   | 87%       | 0.14    |
| Anti HT medications (Mean±SD)   | 90%   | 73%       | 0.04    |

Plasma cholesterol and triglyceride levels were found to be equal in both the group.

Table 5 severity amongst NAFLD patients

| Mild | Moderate | Severe | total |
|------|----------|--------|-------|
| Male | 25       | 11     | 04    | 40    |
| Female | 30     | 12     | 05    | 47    |
HbA1c were associated with the NAFLD. Similar findings were observed by the study done by Patel H et al and Karla S et al.9, 10. In the study 63% the obese patients with diabetes were having mild NAFLD, 26% were having moderate steatosis, 11% were having severe steatosis which is similar to the study by Gupta et al group. (65.5%, 12.5%, 9.35%)

Conclusion
Increasing prevalence of Type 2 DM & NAFLD makes it a public health problem. Type 2 DM is not only a risk factor but it also accelerates its progression. Thus in the presence of the obesity every diabetic patient should undergo evaluation for NAFLD. Also the Type 2 DM must be controlled to prevent insulin resistance and vice-versa NAFLD.

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