Association of non-alcoholic fatty liver with obesity - A Retrospective study

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Ilakkiya Ezhil,
Graduate student, Saveetha dental college,
Saveetha institute of medical and technical sciences,
Saveetha University, Chennai-77.

Mahendra kumar,
Professor, Department of general medicine,
Saveetha medical college,
Saveetha institute of medical and technical sciences,
Saveetha University, Chennai-77.

M.P. santhosh Kumar,
Reader, Department of oral and maxillofacial surgery,
Saveetha dental college,
Saveetha institute of medical and technical sciences
Saveetha University, Chennai-77

Corresponding author
M.P.Santhosh kumar
Reader
Department of oral and maxillofacial surgery,
Saveetha dental college,
Saveetha institute of medical and technical sciences,
Saveetha University, 162, poonamalle high road, velappanchavadi, Chennai -77.

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Abstract

Aim
To find the association of fatty liver in obese patient.

Objective
To assess the relationship between body mass index and non-alcoholic fatty liver disease

Introduction
Non-alcoholic fatty liver disease (NAFLD) is the most common cause of abnormal liver functions. The spectrum of NAFLD ranges from simple steatosis to non-alcoholic steatohepatitis (NASH), which can progress to end-stage liver disease. Obesity is a common nutritional problem often associated with diabetes, insulin resistance, and fatty liver. Major improvements in the biochemical and histological features of liver disease have been observed following weight loss after bariatric surgery in obese patients.

Materials and methods
The retrospective study was conducted in saveetha medical college, Chennai. Case sheets of 40 obese patients were collected. A Performa was created with all the essential details such as name, age, sex, hospital number, final diagnosis, height, weight, BMI, FBS, LFT (TB, DB, SGOT, SGPT, ALP, TP, ALB), RFT, blood urea, lipid profile, USG – abdomen, THS, T3, T4, uric acid. The data was filled in excel sheet and the statistical data was analysed and results were tabulated.

Result
Data from 40 obese patient were recorded out of which is 12 were male and 28 were female out of which 12 patient had NAFLD. Mean height of the patient with NAFLD is 154.7±13.03 and without NAFLD it is 154.5±17.74. Mean height of patient with NAFLD is 85.67±4.5 and without NAFLD is 72.2±18.1. Mean BMI of patient with NAFLD is 36.3±5.63 and without NAFLD is 29.8±5.4. Mean total bilirubin of patient with NAFLD is 0.52±0.23 and without NAFLD is 0.65±0.1. Mean direct bilirubin of the patient with NAFLD is 0.46±0.43 and without NAFLD is 0.5±0.6. Mean SGOT of patient with NAFLD is 28±5.7 and without NAFLD is 31.5±15.9. Mean SGPT of the patient with NAFLD is 25.1±8 and without NAFLD is 26±10.4. Mean alkaline phosphate of patient with NAFLD is 80.4±10.74 and without NAFLD is 67.2±16.48. Mean total protein of patient with NAFLD is 5.59±0.6 and without NAFLD is 6.64±0.72. Mean albumin of patient with NAFLD is 3.17±0.74 and without NAFLD is 3.17±0.83. Mean blood urea in patient with NAFLD is 28.05±5.32 and without NAFLD 30.67±16.61. Mean serum creatine of patient with NAFLD is 0.97±0.3 and without NAFLD is 1.38±0.82.
Conclusion
Recent studies have proved that obesity is one of the emerging major causes of fatty liver leading to cirrhosis. Hence emphasising on weight reduction measures to prevent NAFLD. This study shows 70% of obese patient have fatty liver and controlling obesity can prevent fatty liver.

Introduction
Liver is an important organ, it performs various metabolic activities, it also has the capacity to transform, store and release nutrients [1]. Obesity is one of the dangerous health hazards. Obesity has emerged as a global epidemic with a spectrum of psycho-social and medical consequences. It affects most all the organs, cardiovascular and endocrine systems are affected more than others. Non alcoholic fatty liver (NAFL) is defined as the presence of hepatocellular injury in the form of ballooning of the hepatocytes. Non alcoholic fatty liver disease (NAFLD) resembling alcohol-induced injury but occurs in patients who do not use alcohol. Non alcoholic fatty liver disease (NAFLD) is the most common cause of abnormal liver functions. When fat begins to accumulate outside these regular depots, within the liver and other organs, it is named ectopic fat when it is not due to alcohol abuse then the condition is termed non alcoholic fatty liver disease (NAFLD) [1]. The spectrum of NAFLD ranges from simple steatosis to non alcoholic steatohepatitis (NASH), which can progress to end-stage liver disease. Obesity is a common nutritional problem often associated with diabetes, insulin resistance, and fatty liver. Major improvements in the biochemical and histological features of liver disease have been observed following weight loss after bariatric surgery in obese patients [2-7]. On the basis that obesity is a principal factor in the pathogenesis of NAFLD, it would be. Expected that weight loss should be therapeutic the effect of weight loss on NAFLD remains unclear. Several small studies have examined the effect of diet induced weight loss on NAFLD and have demonstrated an improvement in liver enzyme levels and steatosis [8-15].

Materials and methods
The retrospective study was conducted in saveetha medical college, Chennai. Case sheets of 40 obese patients were collected. A pro-forma was created with all the essential details such as name ,age , sex, hospital number ,final diagnosis, height , weight ,BMI, FBS, LFT (TB, DB ,SGOT, SGPT ,ALP , TP ,ALB ), RFT ,blood urea ,lipid profile , USG –abdomen ,THS, T3 ,T4 , uric acid. The data was filled in excel sheet and the statistical data was analysed and results were tabulated [9,16-18].

Pro-forma
Association of fatty liver and obesity –pro-forma

Name:
Age:
Sex:
Hospital number:
Final diagnosis:

Height:
Weight:
Body Mass Index:
- Mild
- Moderate
- Sever

Fasting blood sugar:
Postprandial:

Liver Function Test:
TB: DB: SGOT: SGPT: ALP: TP: ALB:

Renal Function Test:
Blood urea:

Lipid profile:
USG: - abdomen
- gall stones

Thyroid: - TSH
- T3
- T4

Results
Data from 40 obese patient were recorded out of which is 12 were male and 28 were female out of which 12 patient had NAFLD. Mean height of the patient with NAFLD is 154.7±13.03 and without NAFLD it is 154.5±17.74, mean height of patient with NAFLD is 85.67±4.5 and without NAFLD is 72.2±18.1, mean BMI of patient with NAFLD is 36.3±5.63 and without NAFLD is 29.8±5.4, mean total bilirubin of patient with NAFLD is 0.52±0.23 and without NAFLD is 0.65±0.1, mean direct bilirubin of the patient with NAFLD is 0.46±0.43 and without NAFLD is 0.5±0.6, mean SGOT of patient with NAFLD is 28±5.7 and without NAFLD is 31.5±15.9, mean SGPT of the patient with NAFLD is 25.1±8 and without NAFLD is 26±10.4, mean alkaline phosphate of patient with NAFLD is 80.4±10.74 and without NAFLD is 67.2±16.48, mean total protein of patient with NAFLD is 5.59±0.6 and without NAFLD is 6.64±0.72, mean albumin of patient with NAFLD is 3.17±0.74 and without NAFLD is 3.17±0.83, mean blood urea in patient with NAFLD is 28.05±5.32 and without NAFLD 30.67±16.61, mean serum creatine of patient with NAFLD is 0.97±0.3 and without NAFLD is 1.38±0.82.

Table 1: comparison of NAFLD patient with non NAFLD patient

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>WITH NAFLD</th>
<th>WITHOUT NAFLD</th>
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<tr>
<td></td>
<td>MEAN</td>
<td>SD</td>
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<tr>
<td>HEIGHT</td>
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<td>BMI</td>
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<tr>
<td>DB</td>
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<td>0.43</td>
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<tr>
<td>SGPT</td>
<td>25.1</td>
<td>8</td>
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<tr>
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<td>10.74</td>
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<tr>
<td>TP</td>
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<tr>
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<tr>
<td>BLOOD UREA</td>
<td>28.05</td>
<td>5.32</td>
</tr>
<tr>
<td>S.CREATINE</td>
<td>0.97</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Fig 1: prevalence of NAFLD in obese patient

Discussion

Data from 40 obese patient were recorded out of which is 12 were male and 28 were female out of which 12 patient had NAFLD. Mean height of the patient with NAFLD is 154.7±13.03 and without NAFLD it is 154.5±17.74, mean height of patient with NAFLD is 85.67±4.5 and without NAFLD is 72.2±18.1, mean BMI of patient with NAFLD is 36.3±5.63 and without NAFLD is 29.8±5.4, mean total bilirubin of patient with NAFLD is 0.52±0.23 and without NAFLD is 0.65±0.1, mean direct bilirubin of the patient with NAFLD is 0.46±0.43 and without NAFLD is 0.5±0.6, mean SGOT of patient with NAFLD is 28±5.7 and without NAFLD is 31.5±15.9, mean SGPT of the patient with NAFLD is 25.1±8 and without NAFLD is 26±10.4, mean alkaline phosphate
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Results were similar to the study done by Ronald J.H. Borra [1] which states that increased liver fat content with impaired myocardial metabolism supports the existence of a recently proposed “liver-vessel axis” which hypothesizes that similar biological precursors effect the development of both atherosclerosis and non-alcoholic fatty liver disease (NAFLD). Henrike Sell [2] stated that Chimerin concentrations are elevated in obese patients and it is also a marker of liver disease. Chemerin plasma concentrations decreased after bariatric surgery. John B. Dixon [3] stated that, there was a major improvement in the biochemical and histological features of liver disease associated with obesity and metabolic syndrome with weight loss after LAGB surgery. Giulio Marchesin [4] stated that, the increasing prevalence of obesity, coupled with diabetes, dyslipidemia, hypertension, and ultimately the metabolic syndrome puts a very large population at risk of forthcoming liver failure in the next decades. Prashant Mathur [5] stated that although much remains to be learned about paediatric NAFLD, it is already evident that children with NASH risk progressive liver damage. Hye-soon park, [6] stated that, Degree of hepatic improvement or deterioration did not correlate with the degree of weight reduction or increment, there were significant differences in liver function changes with weight changes between weight reduction groups and non weight reduction groups. Therefore liver function will improve by weight reduction if or their causes are ruled out [19, 20].

Conclusion
Recent studies have proved that obesity is one of the emerging major causes of fatty liver leading to cirrhosis. This study shows 70% of obese patient have fatty liver and controlling obesity can prevent fatty liver.

References
1. Borra R. Nonalcoholic Fatty Liver Disease in Obesity and Type 2 Diabetes-Studies using 1H MRS and PET