Original Paper

Biochemical profile and various treatment modalities of patients with non-alcoholic steatohepatitis (NASH)

Authors

Dr Vinod Kumar¹, Dr Ritu Bhagat²*

¹Consultant Physician, JK Health Services
²Senior Resident Department of Pathology, GMC Jammu, JK India

*Corresponding Author
Dr Ritu Bhagat
R/O Bandhu Rakh Kunjwani, Jammu (J&K) Pin 180010, India
Email: drvkatil76@gmail.com, Mobile 919419965435

Abstract
Introduction: Non-alcoholic fatty liver disease (NAFLD) is an increasingly recognized condition that may progress to end stage liver disease.

Aim: The objective is to study the biochemical profile and various treatment modalities in patients of non-alcoholic steatohepatitis (NASH).

Material and Methods: The present study was carried out on 60 patients of NASH over a period of one year at Pathology Department of GMC, Jammu which is a tertiary care centre. All patients with NASH were screened for various risk factors associated with NASH. Detailed history was taken and thorough clinical examination was done.

Results: out of 60 patients, 28(46.66%) were males and 32(53.32%) were females. 85% of the patients were in the age group of 31-70 years.

Conclusion: In the present study it was found that obesity, hyperlipidemia and diabetes mellitus were significantly associated with the NASH.

Keywords: non-alcoholic steatohepatitis, obesity, liver function test, diabetes mellitus.

Introduction
Non-alcoholic fatty liver disease refers to wide spectrum of liver damage ranging from simple steatosis to steatohepatitis, advanced fibrosis and cirrhosis. Steatohepatitis represents only a stage within the spectrum of non-alcoholic fatty liver disease[1]. Ludwig et al introduced term nonalcoholic steatohepatitis to describe liver disease that is histologically indistinguishable from alcoholic hepatitis but occurs in persons who do not consume excess alcohol[2]. NAFLD is defined as fat accumulation in liver exceeding 5% to 10% by weight. Inherent to defining NAFLD and NASH is threshold at which steatohepatitis become alcohol related. Many centers accepts upper limit of 20-40 gm/day in men and 20gm/day in women[3]. NAFLD is found in 70% of obese and 35% of lean patients. NASH is found in 18.5% of obese and 2.7% of lean patients. There is even distribution of NASH among men and women.
Material and Methods
The present work is a hospital based cross-sectional study that included 60 patients of NASH registered with GMC, Jammu for a period of one year. All patients with NASH were screened for various risk factors associated with NASH. Detailed history was taken and thorough clinical and biochemical profile was done. Required investigations were done such as HB, TLC, DLC, Blood sugar, Renal function tests, Complete liver tests, Serum lipid profile, Viral markers (HBs Ag and Anti HCV) and ANA were done. Ultrasound abdomen for hepatobiliary system was done to diagnose the patients of NASH.

Inclusion Criteria
1. Ultrasonographically proved fatty liver
2. Deranged liver function tests
3. No significant alcohol intake i.e. <20gm/day
4. Absence of other relevant liver disease.

Exclusion Criteria
1. Daily alcohol intake i.e. >20gm/day
2. Use of amiodarone, steroids, tamoxifen, methotrexate or high dose estrogen
3. Jejunal bypass or extensive small bowel resection
4. Other known liver disease
5. Malignancy.

Results
A total of 60 patients enrolled in our study. The present study entiled “Biochemical Profile and Various Treatment Modalities of Non-alcoholic Steatohepatitis (NASH)” was undertaken at GMC, Jammu which is a tertiary care centre. The observations made in the study are as under:

Table 1: Age and Sex distribution

| Age group in years | Males | Females | Total |
|--------------------|-------|---------|-------|
|                    | No.   | Percentage | No.   | Percentage | No.   | Percentage |
| 10-30              | 5     | 8.33      | 2     | 3.33       | 7     | 11.66      |
| 31-50              | 17    | 28.33     | 16    | 26.66      | 33    | 55.0       |
| 51-70              | 6     | 10.0      | 12    | 20.0       | 18    | 30.0       |
| >70                | 0     | 0.0       | 2     | 3.33       | 2     | 3.33       |
| Total              | 28    | 46.66     | 32    | 53.32      | 60    | 100        |

Out of 60 patients, 28 were males and 32 were females. Majority of patients were in the group of 31-50 years (55%) followed by that in 51-70 years (30%). Thus, 85% of the patients were in the age of 31-70 years.

Table 2: Body Mass Index

| Body Mass Index | Male | Female |
|-----------------|------|--------|
| 18.5 – 24.9     | 4(14.28%) | 5(15.62%) |
| 25-29.9         | 8(28.56%) | 15(46.87%) |
| 30-34.9         | 14(50.02%) | 12(37.51%) |
| 35-39.9         | 2(7.14%) | 0      |
| Total           | 28(100%) | 32(100%) |

Table 3: Liver Function Tests

| Tests               | No. of patients | | |
|---------------------|-----------------|---|---|
| Male                | Female          |---|---|
| Increased Serum Bilirubin | 13 | 14 |
| Increased AST       | 24              | 27 |
| Increased ALT       | 28              | 29 |
| AST: ALT > 1        | 2               | 3  |
| Increased Alk PO4   | 6               | 4  |
| Total*              |                 | ---|

Dr Vinod Kumar et al JMSCR Volume 07 Issue 05 May 2019
Table 4: Fasting Blood Sugar

| Fasting blood sugar | No. of patients |
|---------------------|----------------|
|                     | Male   | Female   |
| < 100               | 9 (32.14%) | 14 (43.75%) |
| 100-125             | 9 (32.14%) | 5 (15.62%) |
| ≥126                | 10 (35.72%) | 13 (40.63%) |
| Total               | 28 (100%) | 32 (100%) |

Table 5: Associated Risk Factors

| Risk factors        | No. of patients |
|---------------------|----------------|
|                     | Male   | Female   |
| Obesity             | 16     | 12       |
| Hyperlipidemia      | 17     | 13       |
| Diabetes mellitus   | 10     | 13       |
| Total*              | 43     | 28       |

*The numbers don’t add up to 60 since more than one sign and symptoms were present in single patient.

Various treatment modalities
16 patients followed regularly and remained under close supervision and were evaluated after 6 month of treatment. They were asked to cut down the intake of fats and avoid red meat. They were asked for daily brisk walking for one hour each in the morning and evening. Out of 60, 56 patients were prescribed vitamin E 800 IU/day and 4 patients were put on metformin 500mg/day. After six month, they were re-evaluated and it was found that their raised enzymes reduced markedly.

Discussion
Present study was undertaken in 60 patients to assess the biochemical profile and various treatment modalities of patients with non-alcoholic steatohepatitis. Out of which 28 (46.66%) were males and 32 (53.32%) were females. Maximum patients were in the age group of 31-50 years (55%) followed by that in 51-70 years (30%). Thus 85% of the patients in the age group of 31-70 years.

In the present study it was found that obesity, hyperlipidemia and diabetes mellitus were significantly associated with the NASH.

Table 6: showing various variables of patients with NASH (n=60)

| Variables                  | Mean | Range       |
|----------------------------|------|-------------|
| 1. Age (y)                 | 44   | 22-75       |
| 2. Sex Female (%)          | 32%  |             |
| 3. Anthropometric Data     |      |             |
|   Obesity (%)              | 46%  |             |
|   Overweight (%)           | 39%  |             |
|   Lean (%)                 | 15%  |             |
| 4. Body weight             | 75.3 kg | 56-110   |
| 5. BMI                     | 29.18 | 20.0-39.9 |
| 6. Waist circumference     |      |             |
|   Men > 102 cm             | 10/28 (35%) |             |
|   Women > 88 cm            | 25/32 (78%) |             |
| 7. S.Bilirubin             | 1.4  | 0.5-8.2     |
| 8. AST                     | 73.21 | 28-285   |
| 9. ALT                     | 102.35 | 33-240  |
| 10. Alk Po4.               | 97.75 | 59-176     |
| 11. Glucose tolerance      |      |             |
| 12. Diabetes Mellitus      | 23/60 (38.3%) |             |
| 13. Impaired Glucose Fasting | 14/60 (23.3%) |             |
| 14. Hyperlipidemia         | 30/60 (50%) |             |
In our study 46.6% (28/60) patients were found to be obese and 38.3% (23/60) were found to be overweight. Thus total of 84.9% (51/60) patients had BMI >25. Lee in (1989) demonstrated in his study that 69% patients with NASH were obese[4]. Bacon et al (1994) in their study that 39% patients of NASH were obese[5]. Angulo et al (1999) found in their study that 60% of patients with NASH were obese[6].

In our study 50% (30/60) patients were found to be hyperlipidemic. Out of 30, 16 patients had raised VLDL, 9 patients had raised triglycerides and 5 patients had raised both VLDL and triglycerides. Ludwig et al (1980) in their study found that 67% of patients of NASH were hyperlipidemic[7]. Diehl et al (1988) in their study found that 20% of patients of NASH were hyperlipidemic[8] whereas Bacon et al (1994) in their study found 21% of patients of NASH to be hyperlipidemic[5]. Angulo et al (1999) demonstrated that 27% patients of NASH were hyperlipidemic[6].

In our study of 38.3% (23/60) patients were found to be diabetic. Ludwig et al (1980) found 50% of patients of NASH to be diabetic[7]. In the study conducted by Powell et al (1990), 36% of patients of NASH were found to be diabetic[8]. Bacon et al (1994) demonstrated that 21% of patients were diabetic[5]. Angulo et al (1999) found 28% of patients of NASH to be diabetic[6].

Out of 60 patients only 16 patients followed regularly and remained under close supervision, they were asked to cut down the intake of fats and avoid red meat. They were asked for daily brisk walking for one hour each in the morning and evening. 56 patients were put on vitamin E 800 IU/day. 4 patients were put on metformin 500mg/day. But the patients put on metformin left the study on their own because they were told by someone that metformin is used to decrease blood sugar. All patients were asked for regular follow up but only 16 patients completed study. They were evaluated at the end of six months and it was found that there was marked symptomatic and biochemical improvement.

### Table 7: showing various parameters evaluated before and after treatment showed significant improvement

| Author     | n  | Mean age | Female % | Diabetes % | Obesity % | Hyperlipidemia % |
|------------|----|----------|----------|------------|-----------|-----------------|
| Ludwig     | 20 | 54       | 65       | 50         | 90        | 67              |
| Diehl      | 39 | 52       | 81       | 55         | 71        | 20              |
| Lee        | 49 | 53       | 78       | 51         | 69        | Not reported    |
| Powell     | 42 | 49       | 83       | 36         | 95        | 81              |
| Bacon      | 33 | 47       | 42       | 21         | 39        | 21              |
| Matteoni   | 132| 53       | 53       | 33         | 70        | 92              |
| Angulo     | 144| 51       | 67       | 28         | 60        | 27              |
| Our study  | 60 | 44       | 53       | 38         | 46        | 43              |

### Conclusion
In the present study it was found that obesity was present in 46.6% cases whereas 50% patients were hyperlipidemic. 38% patients were suffering from diabetes. It was found that there was marked symptomatic and biochemical improvement in those who were on strict dietary control and on regular follow up.

### Bibliography
1. Angulo P. Non-alcoholic fatty liver disease. NEJM 2002; 346:1221-31.
2. Caldwell SH, Oesler DH et al. Cryptogenic cirrhosis. Clinical characterization and risk factors for underlying disease. Hepatology 1999; 29: 664-69.

3. Neuschwander Tetri BA and Caldwell SH. Non-alcoholic steatohepatitis: summary of an AASLD single topic conference. Hepatology 2003; 37:1202-19.

4. Lee RG. Nonalcoholic steatohepatitis: A study of 49 patients. Hum Pathol 1989; 20:594-598.

5. Bacon BR, Faravash MJ, Janney CG et al. Non-alcoholic steatohepatitis: An expanded clinical entity. Gastroenterology 1994; 107: 1103-09.

6. Angulo P, Keach JC, Batts KP et al. Independent predictors of liver fibrosis in patients with non-alcoholic steatohepatitis. Hepatology 1999; 30:1356-62.

7. Ludwig J, Viggiano TR et al. Non-alcoholic steatohepatitis: mayo clinic experience with a hitherto unnamed disease. Mayo Clin Proc.1980; 55:434-438.

8. Powell EE, Cooksley WGE, Hanson R et al. The natural history of non-alcoholic steatohepatitis: A follow up study of forty two patients for up to 21 years. Hepatology 1990; 11:74-80.