

**DIETARY AND LIFESTYLE RISK FACTORS OF NON-ALCOHOLIC FATTY LIVER
DISEASE(NAFLD).**

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ABSTRACT: in this paper, To study the dietary and lifestyle risk factors of patients in Non-Alcoholic Fatty Liver Disease, To study the other risk factors of Non Alcoholic Fatty Liver Disease like Diabetes Miletus Type 2, cardiovascular disease, obesity, metabolic syndrome, hypertension & socio-demographic factors, To assess the nutritional status of NAFLD through anthropometry, biochemical records and fibrosis score through non-invasive method, To impart the knowledge about diet and lifestyle management for the patients in the study.

KEYWORDS: Non-Alcoholic Fatty Liver Disease (NAFLD), Non Alcoholic Steato Hepatitis (NASH), Disease, Patients.

INTRODUCTION

Non-alcoholic fatty liver disease (NAFLD) is a condition in which there is accumulation of fat in the liver & it is merely caused in the absence of alcohol consumption.

NAFLD is an worldwide disease condition which is budding as most common liver anomalies in the modern world. It comp rends to the range of irregularities that scale from statuses to liver injury (steatohepatitis).

There are four types of NAFLD

- Type 1
- Type 2
- Type 3
- Type 4

➤ In Type 1 & Type 2 there is mild inflammation in the liver i.e. simple Steatosis.

➤ In Type 3 & Type 4 there is sever inflammation in the liver i.e. Steatohepatitis.

In case fat but no damage to the liver is associated, the disease is called nonalcoholic fatty liver disease (NAFLD) & If fat in liver and indications of inflammation and liver cell damage, the disease is called non alcoholic steato hepatitis (NASH). NAFLD is considered to be the hepatic manifestation of the metabolic syndrome as defined by the following: a) abdominal obesity b) hyper triglyceridemia c) low high density lipoprotein levels d) hypertension e) elevated fasting plasma glucose (Fordtran's).

The advancement of the condition is quiet slow. Few may show symptoms whereas few may be asymptomatic .Where in few people it may cause cirrhosis and death or liver transplantation.

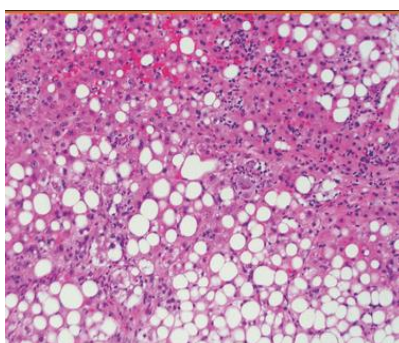


Fig 1.1:histological form of NASH with Steatosis, hepatocyte swelling seen.

Objective

- To study the dietary and lifestyle risk factors of Non-Alcoholic Fatty Liver Disease.
- To study the other risk factors of Non Alcoholic Fatty Liver Disease like Diabetes Miletus Type 2, cardiovascular disease, obesity, metabolic syndrome, hypertension& socio-demographic factors.
- To assess the nutritional status of NAFLD through anthropometry and biochemical records.

To impart the knowledge about diet and lifestyle management for the patients in the study.

PROPOSED APPROACH

To study the Dietary and lifestyle risk factors of Non-Alcoholic Fatty Liver Disease(NAFLD). A total of 160 participated in the study. Questionnaire was used to collect the personal information, socio-demographic and socio-economic information, biochemical parameters, physical activity level, anthropometric measurements, medical problems, dietary intake. The biochemical records and non-invasive fibrosis scan were used to check the degree of fibrosis. Statistical analysis like Chi-square,

paired t-test, Correlation, was done using SPSS v20.0. Dietary analysis was done using NSI Diet Calculator.

LITERATURE SURVEY

(Kate Hallsworth, 2014): Cross-sectional studies suggest that people with NAFLD have lower levels of physical activity than those without and are more prone to fatigue. Increasing sedentary behaviour is becoming a growing problem in the general population, and low levels of physical activity are compounded by an increase in physical inactivity. Sedentary behaviour, including activities such as sitting, is reported to be higher in people predisposed to the metabolic syndrome, excessive adiposity and T2DM. Not only is the total duration of sedentary time important for metabolic risk, but also the breaks in sedentary time, independent of total sedentary time. Consequently, increases in sedentary time could play a potential role in the development of, or predisposition towards NAFLD, independent of physical activity/exercise, and needs to be considered when introducing lifestyle interventions. Targeting a reversal of sedentary behaviour may also provide an additional therapeutic avenue to complement physical activity and exercise guidelines.

Shahinul Alam, 2014: All the patients were clinically evaluated: blood pressure, BMI, and WC were recorded for every patient. Patients with BMI of ≥ 25 kg/m² were defined as obese, and those with a BMI of < 25 kg/m² were labelled as non-obese. Liver function tests were performed prior to the liver biopsy. Blood samples were obtained under fasting conditions, and the following tests were performed using standard laboratory methods: ALT, AST, alkaline phosphatase, gamma-glutamyltranspeptidase (GGT), international normalized ratio (INR), and blood glucose fasting.

Singh SP1, 2015: NAFLD patients had higher BMI, waist-hip ratio and waist-height ratio compared to controls. Fasting blood sugar and triglyceride levels were significantly higher in NAFLD group. Majority (90.2%) of NAFLD patients were sedentary. Family history of metabolic syndrome (MS) was positively correlated with NAFLD. Dietary risk factors associated with NAFLD were non-vegetarian diet, fried food, spicy foods and tea. Diabetes, hypertension, snoring and sleep apnoea syndrome were common factors in NAFLD. On multivariate PCA, waist/height ratio and BMI were significantly higher in the NAFLD patients.

RESULTS AND DISCUSSIONS

The present study was conducted to study the dietary & lifestyle risk factors of the patients in Non-Alcoholic Fatty Liver Disease & to assess the nutritional status of NAFLD patients through anthropometry, biochemical records & Fibrosis score.

Data collected for the study is tabulated & discussed under the following topics:- Socio-Demographic profile, anthropometry, medical history, lifestyle, addictions & dietary habits by taking the 3 day diet recall & food frequency questionnaire.

This was an Observational Study (Cross- sectional). A total of 160 patients were interviewed during the period of data collection from August-November using a semi- structured validated questionnaire.

This chapter analyses & interprets the data obtained from 160 NAFLD patients

Socio-Demographic profile of NAFLD patients:

Under this topic the general details of patients such as age, religion, education, occupation, income, type of family & socio-economic status classification (Kuppuswamy Scale 2014) of NAFLD patients were included.

Socio-Demographic profile of NAFLD patients:

BASELINE INFORMATION	FREQUENCY (n=160)	
	n	%
GENDER(1.2±0.40)		
Male	128	80
Female	32	20
AGE in year(48.24±13.21)		
20-29	16	9.9
30-39	29	18.2
40-49	43	27
50-59	38	24
60-69	22	13.9
70-80	12	7
RELIGION(1.18± 0.5)		
Hindu	139	86.9
Muslim	13	8.1
Christian	8	5.0
PLACE OF RESIDANCE (1.7±0.66)		

Urban	66	41.3
Rural	76	47.5
Semi-urban	18	11.3
FAMILY TYPE (1.28±0.44)		
Joint	44	27.5
Nuclear	116	72.5
LAST JOB (12.46±9.34)		
Farmer	29	18.1
Shopkeeper	4	2.5
Fishermen	1	0.6
Policemen	1	0.6
Bank	1	0.6
Teacher	8	5.0
Housewife	30	18.8
Tech.	1	0.6
Driver	7	4.4
Coli	2	1.3
Co-operative society	1	0.6
Retired	16	10.0
Student (work)	1	0.6
Medical representative	2	1.3
Poojari	2	1.3
Business	16	10.0
Labour	5	3.1
Hair salon	1	0.6
Private company	1	0.6
Contractor	6	3.8
Sub register	1	0.6
KEB	1	0.6
HP gas	1	0.6

Tent house	1	0.6
LIC agent	1	0.6
Financer	5	3.1
Electrical contract	3	1.9
Painter	2	1.3
Auto driver	1	0.6
Gold smith	1	0.6
Govt service	2	1.3
College	1	0.6
Engineer	1	1.3
Tailor	1	0.6
Gas agency	1	0.6
	FREQUENCY (n=160)	
	n	%
Mess handler	1	0.6
EDUCATION		
Professional degree	1	0.6
Graduate or Post graduate	21	13.1
Intermediate or post high school diploma	14	8.8
High school certificate	8	5.0
Middle school certificate	2	1.3
Primary school certificate	0	0
Illiterate	1	0.6
OCCUPATION		
Professional	3	1.9
Semi-profession	7	4.4
Clerical, shop owner, farmer	32	20.0
Skilled worker	2	1.3
Semi-skilled worker	1	0.6

Unskilled worker	1	0.6
Unemployed	1	0.6
INCOME OF THE FAMILY (Rs/- per month		
>=36997	91	56.9
18498- 36996	26	16.3
13874- 18497	7	4.4
9249- 13873	1	0.6
5547- 9248	2	1.3
1866- 5546	2	1.3
<=1865	3	1.9
SES CLASS (Kuppuswamy scale 2014) (20.88±3.43)		
Upper	3	1.9
Upper middle class	146	91.3
Lower middle class	7	4.4
Upper Lower	4	2.5

From the table there were maximum of male patients 128 (80%) and 32 (20%) of female patients out of the 160 patients which is the total sample size. It was observed that maximum number of patients 43 (27%) fall in the age range of 40-49 years, followed by 38(24%) fall in the age range of 50-59 years, 29 (18.2) fall in the age range of 30-39 years, 22 (13.9) fall in the age range of 60-69 years, 16(9.9) fall in the age range of 20-29 years and only 12(7%) patients fall in the age range of 70-80 years respectively. Majority of the patients were Hindu 139(86.9), 13(8.1%) were Muslims & remaining were 8(5%) Christians.

Kuppuswamy scale is used to measure the socio-economic status of an individual in the community based on the three variables namely occupation, education & income. The education status of patients varied from the illiterates to professional degree. Majority of the patients are graduates or post graduates 21(13.1%), 14(8.8%) are intermediate certificate, 8(5%) are high school certificate, 2(1.3%) of patients have completed middle school certificate, and only 1(0.6%) patient was illiterate.

About 32(20%) of the patients had clerical, shop owner or farmers as their occupation, 7(4.4%) of the patients are semi-professionals, 3(1.9%) were professionals, 2(1.3%) were skilled workers and only 1(0.6) was semi-skilled worker, 1(0.6%) was unskilled worker, 1(0.6%) was unemployed.

About 30(18.8%) of the patients were housewife's, 29(18.1%) were farmers, 16(10.0%) were retired and had their own business respectively. 8(5%) were teachers, 7(4.4%) were drivers, 6(3.8%) were contractors, 5(3.1%) were labours and financiers respectively. 4(2.5%) were shopkeepers, 3(1.9%) were electrical contractors, 2(1.3) were coolly, medical representatives, poojaris, painters, govt service, engineers respectively. 1(0.6%) was fishermen, policemen, bank employee, technician, co-operatives society worker, student(work), barber, private company, sub register, KEB, HP gas, tent house, LIC agent, auto driver, goldsmith, student, tailor, gas agency, mess handler respectively was their occupation.

According to Kuppuswamy scale classification, maximum number of patients 146(91.3%) came under the upper middle class. About 7(4.4%) patients were lower middle class. About 4(2.5%) patients were in upper lower & 3(1.9%) patients were in upper class respectively.

According to the table 4.1.1 the socio demographic factors were identified, as the risk factors of NAFLD i.e in gender 128(80%) are males, through the study males are identified as the risk factor of NAFLD.

In the age category 43(27%) & 38(24%) are in the age group of 40-59 years of age, hence through this study the age group 40-59 years are identified as the risk factor of NAFLD.

In the religion category 138(86.9%) of the patients are Hindu, therefore through this study Hindus are identified as the risk factor of NAFLD.

In the place of residence category 76(47.5%) & 66(41.3%) patients are from rural & urban area, hence the residence of both rural & urban are identified as risk factor of NAFLD.

In family type category 116(72.5%) of the patients have an nuclear type of family, therefore nuclear family type is been identified as the risk factor of NAFLD.

In job or occupation category 30(18.8%) & 29 (18.1%) patients were housewife & farmer, hence housewives & farmers are been identified as the risk factor of NAFLD.

According to the education category 21(13.1%) & 14(8.8%) of the patients are Graduates or postgraduates & intermediate or past high school certificate, therefore graduates & intermediate are identified as the risk factor of NAFLD.

In occupation category (kuppuswamy) 32(20%) of the patients were farmers, shop owners, hence through this study farmers, shop owners are identified as risk factor of NAFLD.

According to SES score 146(91.3%) of the patients were upper middle class, hence upper middle class people are identified as risk factor of NAFLD.

CONCLUSION

In this paper, It can be concluded that the dietary habit, lifestyle, other risk factors, anthropometry play an important role in the Nutritional status of NAFLD patients. The lifestyle that contributes to the leading factor of NAFLD is due to sedentary lifestyle and lack of exercise. In dietary consumption the patients consume majority of non-vegetarian food, fat, the consumption of fruits and vegetables i.e. green leafy vegetables, roots and tubers and other vegetables are comparatively less than the RDA intake. we have seen that the consumption of Tea and coffee is more which is also an other leading factor for the cause of NAFLD. Majority of the patients BMI were overweight and the waist hip ratio was all comparatively high. Modification of the diet and lifestyle habits will show improvement in the overall health and reduces clinical symptoms.

REFERENCES:

- Fan JG, C. H. (2013, december 28). Role of diet and nutritional management in non-alcoholic fatty liver disease. *pubmed* .
- Fan JG, S. T. (2005). Fatty liver and the metabolic syndrome among Shanghai adults. *J Gastroenterol Hepatol. pubmed* , 1825-1832.
- Farrel GC, L. C. (2006). Nonalcoholic fatty liver disease: from steatosis to cirrhosis. S99-S112.
- Ferreira VS, P. R. (2010, june). Frequency and risk factors associated with non-alcoholic fatty liver disease in patients with type 2 diabetes mellitus. *pubmed* , 362-368.
- Ford ES, G. W. (2002). Prevalence of the metabolic syndrome among US adults: findings from the third National Health and Nutrition Examination Survey. *pubmed* , 356-359.
- Fordtran's, S. a. *gastrointestinal and liver disease* (10th edition ed., Vol. 2). (M. L. Mark Feldman, Ed.)
- Gopalan C, R. S. (2004). Nutritive Value of Indian Foods, 1st edn. National Institute of Nutrition; Indian Council of Medical Research. 45-95.
- Hemant Chatrath, M. R. (2012, february). Dyslipidemia in Patients with Nonalcoholic Fatty Liver Disease. *PMC* , 22-29.
- Jorge A.Lopez-Velazquez, K. V.-V.-R.-T.-S. (2014). the prevalence of non-alcoholic fatty liver disease in the americas. *Annals of hepatology*, 13, 166-178.

- Kang H, G. J. (2006). Metabolic syndrome is associated with greater histologic severity, higher carbohydrate, and lower fat diet in patients with NAFLD. *pubmed* , 2247-2253.
- Kenichiro Yasutake, M. K. (2014, february 21). Dietary habits and behaviors associated with nonalcoholic fatty liver disease. *world journal of gastroenterology* , 1756-1767.
- Larter CZ, Y. M. (2009). Role of adipose restriction and metabolic factors in pregression of steatosis to steatohepatitis in obese, diabetic mice. *pubmed* , 1658-1668.
- Lavekar Anurag, S. A. (n.d.). Non-alcoholic fatty liver disease prevalence and associated risk factors – A study from rural sector of Maharashtra. *tropical gastroentrology* .
- Lu, Q.-Q. Z.-G. (2015, march 3). Nonalcoholic Fatty Liver Disease: Dyslipidemia, Risk for Cardiovascular Complications, and Treatment Strategy. *journal of clinical and translational hepatology* , 78-84.
- Manal F. Abdelmalek, A. S.-A. (2010, june). INCREASED FRUCTOSE CONSUMPTION IS ASSOCIATED WITH FIBROSIS SEVERITY IN PATIENTS WITH NAFLD. *PMC* , 1961-1971.
- Marchesini G, B. E. (2003). Nonalcoholic fatty liver, steatohepatitis, and the metabolic syndrome. *pubmed* , 917-923.
- Misra A, C. P. (2009). Consensus statement for diagnosis of obesity, abdominal obesity and the metabolic syndrome for Asian Indians and recommendations for physical activity, medical and surgical management. *pubmed* , 163-170.
- Misra A, V. N. (2002). Insulin resistance syndrome (metabolic syndrome) and Asian Indians. *pubmed* , 1483-1496.
- Naim Alkhouri, M. a. (2012, october 8). Noninvasive Diagnosis of NASH and Liver Fibrosis Within the Spectrum of NAFLD. *Gastroentrology and hepatology* , 661-668.
- Pinidiyapathirage MJ1, D. A. (2011). Nonalcoholic fatty liver disease in a rural,physically active, low income population in Sri Lanka. *BMC Research Notes* .
- R.Schiff, E. *Diseases of the liver* (10th edition ed., Vol. 2). (W. C. Michael F.Sorrell, Ed.)
- Sathiaraj, E. (2011). A case-control study on nutritional risk factors in non-alcoholic fatty liver disease in Indian population. *European journal of clinical nutrition* (10), 533-537.