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RESEARCH ARTICLE

SPECTRUM OF FATTY LIVER AT TERTIARY CARE CENTRE OF NORTHEREN INDIA

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Abstract

Introduction: It isimportant to determinethe epidemiological factors like etiology, age, sex, mode of clinical presentation of fatty liver and development of complications like chronic liver disease, so as to design optimal and cost effective preventive and treatment strategies for the same.

Aim: To determine spectrumof Fatty Liver at tertiary care centerof Northern India.

Material and Methods: This was a prospective study conducted at Medical Gastroenterology Department, PGIMS,Rohtak , over a period of seven years i.e. 01.11.2017 to 31.10.2024, on 582confirmed patients of Fatty Liver.

Results: The most common etiology seen was Non-Alcoholic Fatty liver disease (82.47%), followed by Chronic HBV infection (11.37%), Chronic Hepatitis C (3.60%) and Alcoholic Liver Disease (2.57%),

Conclusion: The present study reveals that Nonalcoholic Fatty liver disease is most common causeof Fatty liver in Northern India.

Introduction:-

Fatty liver is the first insult to liver which can occur due to many reasons including Nonalcoholic Fatty liver disease (NAFLD), Alcoholic liver disease (ALD), Chronic Hepatitis B virus (HBV) or Chronic Hepatitis C virus (HCV) infection etc. The determination of fatty liver alarms the treating physician for further progression to hepatitis, cirrhosis and ultimately into Hepatocellular carcinoma (H.C.C.). NAFLD is a distinct hepatic disorder observed in patients without a history of significant alcohol consumption that histologically resembles alcohol induced liver damage. It was first described in obese and diabetic women **[1]**. The spectrum of NAFLD passes from stage of simple Fatty liver to non-alcoholic steatohepatitis (NASH), Cirrhosis and finally into small subset of patients into Hepatocellular carcinoma (H.C.C.) **[2]**. Like chronic hepatitis B, NAFLD in few cases, can directly progress to H.C.C without intervening stage of cirrhosis. Now universally NAFLD like Chronic HCV has become one of the most common etiological factors for causing end stage liver disease and requiring liver transplantation. NAFLD has been associated with insulin resistance, which includes obesity, diabetes, hypertriglyceridaemia and hypertension. In addition, NASH has also been associated with hyperlipoproteinemia, jejunal bypass, parenteral nutrition, drugs, α1-antitrypsin deficiency, bacterial overgrowth, and environmental toxins. Exposure to chemicals is suspected to be another risk factor. Iron overload, H63D mutation of the HFE gene, and immune system anomalies are frequent in patients with non- alcoholic steatohepatitis. Recent reports have also described hepatocellular carcinoma arising in patients with NASH associated cirrhosis **[3]**. Chronic HBV and HCV infection usually remain asymptomatic for a long period and thus impact on liver which begins with fat infiltration is not detected in many. A certain subset of patient in chronic HBV and HCV infection present in late stage i.e. cirrhosis. Thus, in these patients' fatty liver stage

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has already progressed to cirrhotic stage. In majority of cases of ALD, the consultation is sought at later advanced stage when already cirrhosis has set in. Thus, fatty liver stage is not frequently seen. The ALD patients are usually reluctant for timely consultation, as they know that once they are diagnosed to be having side effects of alcohol on their body, then it will lead to pressure on leaving alcohol from family and friends.

Aim:-

To determine spectrum of Fatty Liver at tertiary care centerof Northern India.

Material and Methods:-

This was a prospective study done at Medical Gastroenterology Department, PGIMS,Rohtak conducted over a period of seven years i.e. 01.11.2017 to 31.10.2024, on 582confirmed cases of Fatty liver. The patients who visited the Medical Gastroenterology Department in last five years and were confirmed to be having only Fatty Liver on ultrasonogram and no cirrhotic changes , after proper consent werer enrolled in the study. Their detailed records were collected regardingaeitiological and epidemiological factors , clinical spectrum and were followed regularly. The detailed clinical examination and laboratory investigations were done including complete blood counts, liver function tests , kidney function tests,thyroid function test, serum IgA TTG antibody, serum electrolytes, coagulation parameters (PT, INR), blood sugar, autoimmune profile, Serum ceruloplasmin level, 24 hour urinary copper excretion level, Hbs Ag, anti HIV antibody, anti HCV antibody, HBV DNA Quantitative, HCV RNA Quantitative,ultrasonogram abdomen, chest x ray PA view and Fibroscan.

Observations:-

Out of the total study group of 582 confirmed patients of Fatty liver, the most common etiology determined was Non-Alcoholic liver disease (480 patients, 82.47%), followed by Chronic Hepatitis B (66 patients,11.37%), Chronic Hepatitis C (21 patients, 3.60%)and Alcoholic liver disease (15 patients, 2.57%).

On individual analysis of Non-Alcoholic Fatty liver disease, out of total 480 patients, 228 (47.50%) were male and 252 patients (52.50%) were female. On analysis of rural-urban distribution,282 patients (58.75%) belonged to rural areas and 198 patients (41.25%) belonged to urban areas. On analyzing age distribution curve, none patient was seen in 0-10 yrs of age after which gradual upward trend was noted i.e. 11-20 years (15 patients, 3.12%), 21-30 yrs (72 patients, 15 %) and peak was seen between 31-40 yrs (126 patients, 22.10 %), followed by gradual decline i.e. 41-50 yrs (102 patients,21.25% , 51-60 yrs (90 patients, 18.75%), 61-70 yrs (66 patients, 14.37%), 71-80 yrs (1 patient, 0.6%) and 81-90 yrs (1 patient, 0.6%). Out of total 480 patients, a significant proportion i.e. 174 patients, 36.25% were in stage of Non-alcoholic steatohepatitis as evidenced by raised transaminases. The Dyslipidemia was seen in 120 patients (25%), 36 patients (12.50%) were diabetic and 24 patients (5%) were hypothyroid.

On individual analysisof 66 patients (11.34%) of Chronic Hepatitis B related Fattyliver, 51 (77.27%) were male and 15 patients (22.73%) were female, 54 patients (81.81%) belonged to rural areas and 12 patients (18.19%) belonged to urban areas. On analyzing age distribution curve, none patient was seen in 0-10 yrs of age after which gradual upward trend was noted i.e. 11-20 years (3 patients, 4.54%), 21-30 yrs (12 patients, 18.18 %) and peak was seen between 31-40 yrs (21 patients, 31.81%), followed by gradual decline i.e. 41-50 yrs (12 patients, 18.18%, 51-60 yrs (6 patients, 9.09%), 61-70 yrs (12 patients, 18.18%), 71-80 yrs (1 patient).

The analysis of 21 patients (3.60%) of Chronic hepatitis C related Fatty liver group, 18 (85.71%) were male and 3 patients (14.29%) were female, 18 (85.71%) belonged to rural areas and 3 patients (14.29%) belonged to urban areas. On analyzing age distribution curve, none patient was seen in 0-30 yrs of age after which gradual upward trend was noted i.e. 31-40 yrs (6 patients, 28.57 %), 41-50 yrs (12 patients, 57.14% and 51-60 yrs (3 patients, 14.28%).

On analyzing 15 patients, 2.57% of Alcoholic Fatty liver disease group, all 15 were males (100%), 12 patients (80%) belonged to rural areas and 3 patients (20%) belonged to urban areas. On analyzing age distribution curve, none patient was seen in 0-30 yrs of age after which gradual upward trend wasnoted i.e. 31-40 yrs (6 patients, 40 %), 41-50 yrs (3 patients, 20%) and 51-60 yrs (6 patients, 40%).

Category	Number of Patients (582)
NAFLD	480 (82.47%)
HBV	66 (11.34%)

ALD	21 (3.60%)
HCV	15 (2.57%)

Table 1:- Showing Distribution ofFatty Liver Patients on Basis of Etiology.

Sex	NAFLD (480)	HBV (66)	HCV (21)	ALD (15)
Male	228 (47.50%)	51 (77.27%)	18 (85.71%)	15 (100%)
Female	252 (52.50%)	15 (22.73%)	3 (14.29%)	0 (0%)

Table 2:- Showing Sex Distribution of Fatty LiverPatients.

Residence	NAFLD (480)	HBV (66)	HCV (21)	ALD (15)
Rural	282(58.75%)	54 (81.81%)	18 (85.71%)	12 (80%)
Urban	198 (41.25%)	12 (18.19%)	3 (14.29%)	3 (20%)

Table 3:- Showing Rural and Urban Distribution of Fatty LiverPatients.

Age Group	NAFLD (480)	HBV (66)	HCV (21)	ALD (15)
0-10	00	00	00	00
11-20	15	03	00	00
21-30	72	12	00	00
31-40	126	21	06	06
41-50	102	12	12	03
51-60	90	06	03	06
61-70	69	12	00	00
71-80	03	00	00	00
81-90	03	00	00	00

Table 4:- Showing Age Distribution of Fatty Liver Patients.

NAFLD	NASH	Dyslipidemia	Diabetic	Hypothyroid
480 Patients	174 patients	120 patients	36 patients	24 patients
Percentage	36.25%	25%	12.50%	5%

Table 5:- Showing Distribution of Parameters in NAFLD Group.

Discussion:-

There are many studies worldwide on NAFLD but there is paucity of data for other etiologies and their contribution in total pool of Fatty liver disease. This was the reason for conducting this study which was hospital-based study with aim of determining the etiologyof Fatty liver disease in our region. Male predominance was seen in all the various groups of Fatty liver diseases except in NAFLD group. The majority of patients in all the groups were seen in middle age group (30-60 yrs). In comparison to other etiologies like HBV, HCV and ALD, NAFLD patients were seen at both extreme of ages i.e. from 10 yrs to 85 yrs. We know that Paediatric NAFLD has assumed significant percentage in overall NAFLD group worldwide. The NAFLD in elderly can be explained on basis of occurrence at later agesand slowerprogression in comparison to other etiologies. That means HBV, HCV and ALD patients either recover due to stopping alcohol or by treatment or succumb to their illness before reaching to much elder age group. If comparison is made with etiological reasons for chronic liver disease, as shown by Malhotra etal [**4**], in which most common causefound was Alcoholic liver disease (48.9%), followed by Non alcoholic liver disease (26.4%), Chronic Hepatitis B (12.3%), Chronic Hepatitis C (9%), Cryptogenic (2.7%) and Autoimmune liver disease related (0.7%) which is in contrast to Fatty liver disease spectrum in which NAFLD predominates. The reason behind this can be that majority of ALD patients present late as they are averse to take treatment for the same. Regarding HBV infection explanation can be that majority of new patients diagnosed are incidentally detected, are asymptomatic and have low viral load i.e. are chronic inactive carriers and only few are in active stage which can manifest as normal liver on ultrasonogram, Fatty liver or cirrhotic changes. In HCV also, low percentage of Fatty liver seen can be due to incidental detection in majority of patients who are asymptomatic. In our study, rural predominance was seen in all the groupsof Fattyliver disease. Out of total pool of 480 patients in NAFLD group, steatohepatitis as evidenced by raised transaminases was seen in 174 patients (36.25%). The Dyslipidemia was seen in 120 patients (25%) and in this most common was increased cholesterol level followed by increased Serum triglycerides and Low-density lipoprotein (LDL) levels. In NAFLD group, 36 patients (12.50%) were diabetic and 24 patients (5%) were hypothyroid. NAFLD has become second most common reason for Chronic Liver Disease (CLD) in India because

of increasing trend of sedentary life style and contribution from increased number of patients of Diabetes Mellitus.In India, under National Viral Hepatitis Control Program (NVHCP), free treatment is being given for hepatitis B & C all over India for curbing the menace of these deadly disease. As per results of our research, there is urgent need of taking steps for determining and controlling the factors leading to alcoholic liver disease and non-alcoholic fatty liver disease because of their significant contribution in total pool of CLD in India. In both of these etiological factors, public awareness on large scale is required because it is well said that prevention is better than cure. Moreover, Liver transplant which is the only definitive treatment for End Stage liver disease, is beyond reach of majority of Indians due to its limited availability, less number of organ donation and financial constraints. Hence, in developing country like India, aim should be not to make patients reach End stage liver disease and on transplant waitlist.

Conclusion:-

Fatty liver disease is common entity in Northern India with male preponderance except in NAFLD and affecting mostly people of middle age group. NAFLD is major cause of Fatty liver disease, followed by Chronic hepatitis B & C and ALD.The casual approach of Nothing to worry for Fatty liver should be changed to aggressively dealing with the etiology causing Fatty liver, so as to prevent its progression to hepatitis, cirrhosis and H.C.C. Hence government should prioritize onmaking National health policy on NAFLD as done for hepatitis B & C under National viral hepatitis control program (NVHCP).

Conflict Of Interest-

The authors disclose that there is no conflict of interest.

Author Contribution

Parveen Malhotra, - Conceived, Designed and Formulated this Prospective analysis
Data Analysis- Vani Malhotra
Reviewed Draft of paper- Yogesh Sanwariya,Nikita
Data Collection- Bipin, Harman Singh

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