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Epidemiology of Non Alcoholic Fatty Liver among Adults (20-50 Yrs)

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ABSTRACT

The aim of this study is to assess the prevalence, symptoms, risk factors, type of NAFLD (non-alcoholic fatty liver) among adults of Malappuram district in Kerala and also to estimate the association of non-alcoholic fatty liver in diabetes mellitus. The food habits of the people in Malappuram district are seemed to be unhealthy and they were more dependent on junk foods and the patients had a negative attitude towards the disease thus were avoiding even medications. The data was collected from 200 samples using questionnaire from different health clinics of Malappuram district. It was found that stage 1 NAFLD (53.7%) is the most popular among selected samples($p<0.05$ level).Majority of patients were not aware about the seriousness and health hazards of non alcoholic fatty liver. 45.1 %of the sample had obesity, 35.3 % showed diabetes most of them were pre-diabetic and 10 % sample had high cholesterol level. Most of the patients had abdominal swelling and increased cholesterol level. NAFLD is strongly associated with or caused by type 2 diabetes, insulin resistance, and metabolic syndrome.

Key Words : Non-alcoholic Fatty Liver Disease, Non-alcoholic steato hepatitis, Hepato cellular Carcinoma, Diabetes, Obesity, Metabolic syndrome

INTRODUCTION

NAFLD is growing, even in the developing world, because of the global obesity epidemic. Moreover, very close association between the disease and metabolic syndrome has been identified .It is the accumulation of triglycerides and other fats in the liver cells (Turpin *et al.,* 2014). The amount of fatty acid in the liver depends on the balance between the processes of delivery and removal (Ludwig *et al*., 1980). In some patients, fatty liver may be accompanied by hepatic inflammation and liver cell death (steatohepatitis). Non-alcoholic fatty liver disease (NAFLD) is currently the most common chronic liver disease in developed countries because of the obesity epidemic (Ong and Younossi, 2007). The disease increases liver-Related morbidity and mortality, and often increases the risk for other comorbidities, such as type 2 diabetes and cardio-vascular disease (Younossi *et al*., 2016). Environmental and lifestyle-related factors such as a low physical activity level and a high-fat diet are associated with NAFLD development and are related to insulin resistance (Shashaj *et al*., 2016). Extra hepatic malignancy (colon, esophagus, stomach, pancreas, kidney, and breast) is the second most common cause of death in patients with NAFLD. The primary association between NAFLD and malignancy is found in the colon (Denmark-wahnefried *et al*., 2020).

Five to twenty percent of patients with fatty liver develop nona lcoholic steatohepatitis (NASH) in their clinical course, of which 10–20% develop into higher-grade fibrosis and <5% progress to full-blown cirrhosis (Duseja, 2010). The prevalence of NASH may be underestimated, as the diagnosis requires histological confirmation. It is considered that at least 5% of the population may have NASH (Anderson *et al.,* 2015). Prevalence of NAFLD among the at-risk group is even

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higher.

Obesity and metabolic syndrome (MS) are the most important risk factors identified in the development of NAFLD, and diabetes mellitus and hypertension are also linked to greater progression of the disease (Newton, 2010). Non-alcoholic fatty liver disease (NAFLD) has emerged as the most prevalent chronic liver disease in developed nations in recent years (Neuschwander-Tetri and Caldwell, 2003). It is defined as the presence of 5% steatosis in the absence of secondary causes of fat accumulation in the liver (Falck-Ytter *et al*., 2001). So the study is mainly focused on to estimate the prevalence of non-alcoholic fatty liver in diabetes mellitus, identify the risk factors, symptoms and type of NAFLD in selected samples.

METHODOLOGY

The questionnaire was used as a tool for the data collection. The questionnaire consists of questions regarding prevalence and types of NAFLD, symptoms, risk factors, relationship between fatty liver and diabetes mellitus.

Collection of responses:

The people of Malappuram district are more dependent on junk foods and seemed to be un healthy. Therefore, they are more prone to non-communicable disease like diabetes, hypertension, CVD etc. 100 samples were randomly selected from different clinics of malappuram district and the samples were young adults in the age group between 20-50 years. A simple random sample is chosen in such a manner that each possible of the sample of the same size has the same chance of being selected, all individual are equally likely to be included in the sample. The information was collected in different ways, the first data was collected from clinic to collect the information about the non-alcoholic fatty liver patients who already done health in the clinics. When the pandemic rose, the information was collected through google form and telephone interview from each sample. Health conditions were recorded based on self-reported history of fatty liver, diabetes, and hypertension.

Statistical analysis:

The collection was consolidated, analysed and interpreted using various statistical tools. Descriptive analysis is carried out to obtain means and standard deviations. The association of non-alcoholic fatty liver with various risk factors among the samples was evaluated by using chi square test.

RESULTS AND DISCUSSION

During the screening of Non-alcoholic fatty liver Disease among selected samples, it was detected that 41% of the selected samples had non-alcoholic fatty liver (P<0.001). This group is more prone to elevated levels of diabetes, cholesterol level (from clinical data) .59 % of the samples does not showed any type of liver disease (Table 1).

Most of the sample effected simple fatty liver disease (stage1) (53.7%). The 24.7 % of the sample showed stage 2 fatty liver disease (steato hepatitis) and only least (24%) population effected fibrosis (P<0.05) (Table 2).

It shows that majority of Non-alcoholic fatty liver patients belongs to the age group between 31-40 years (53.6 %).The reduced liver function and that, which occurs with aging, has been causally associated with a decline in hepatic blood and liver volume (Wilson *et al*., 1994). Nearly very low NAFLD population size is present in 20-30 years age group (19.5 %) NAFLD is common in the elderly, in whom it carries a more substantial burden

Table 1 : Prevalence of non-alcoholic fatty liver (N=100)

Prevalence	No. of respondents (N=100)	Percentage of prevalence	Mean	SD	P value
Fatty liver	41	41	40.95	6.64	0.001*
No fatty liver	59	59	36.10	6.62	

SD- Standard Deviation *Highly significant (p<0.001)

Table 2 : Type of fatty liver (N=100)

Type of NAFLD	Percentage (%)	Chi square	P value
Stage 1	53.7		
Stage 2	24.4	3.07	.003*
Fibrosis	22		

*significant (P<0.05)

Table 3 : Socio demographic characteristics of NAFLD				(N=100)
Particular	Category	Percentage (%)		P value
		Fatty liver	No fatty liver	
Age	20 to 30	19.5	11.8	.001
	31 to 40	53.6	40.6	
	41 to 50	26.8	47.5	
Sex	Male	51.25	54.2	.7666
	Female	48.8	45.8	

of hepatic (nonalcoholic steatohepatitis, cirrhosis and hepatocellular carcinoma) and extra-hepatic manifestations and complications (cardiovascular disease, extra hepatic neoplasms) than in younger age groups (Schmucker, 2005). Therefore, proper identification and management is necessary. Of the total selected samples 51.2% have fatty liver they were males. Several studies proves that Prevalence is higher in men than in women (Jameson and Longo, 2015) and 48.86 % were females, so it is clear that male populations are more prone to this type of liver disease (Table 3).

The 45.1% of the sample had obesity, 35.3 % were pre-diabetic and 10% of sample had high cholesterol level. The increased risk for CVD in patients with NAFLD may be due to their increased burden of cardio metabolic risk factors or because NAFLD contributes directly to CVD risk (Satapathy and Sanyal, 2015). NAFLD is cross-sectionally associated with CVD risk factors including higher mean blood pressure, adverse lipid profiles, impaired fasting glucose, as well as higher prevalence of metabolic syndrome, hypertension, and type 2 diabetes, even after adjusting for visceral adipose tissue (Rinella, 2015) (Table 4).

Table 4 : Risk factors of non alcoholic fatty liver (N=100)	
Risk factors	Percentage (%)
Obesity	45.1
Diabetes	35.3
High cholesterol	10
Ovarian disorders	2
Others	7.6

Only few samples showed the symptoms of NAFLD, around 22 % selected samples had not shown any types of symptoms. Majority of the sample shows nose bleeding and 22 % of sample shows the abdominal swelling due to excess accumulation of fat in the lower part of the abdomen. Spider veins are caused when fat builds up in the liver from fatty liver disease, and blood flows sluggishly or clots, which impacts blood pressure, among selected samples and 15 % of the sample showed blood vessel under the skin (Fig. 1).

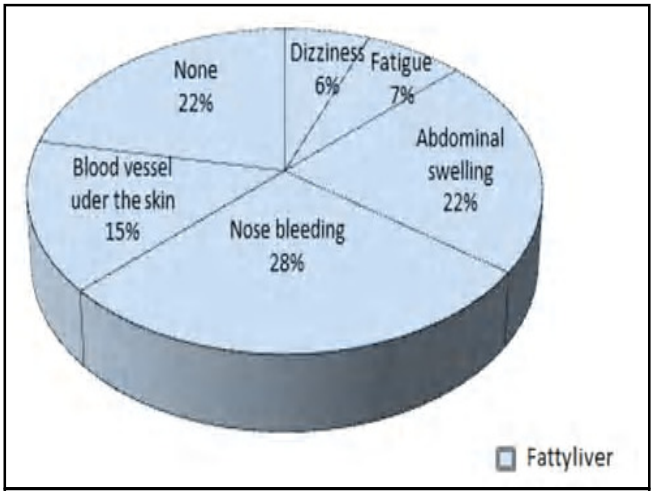

Fig. 1 : Noticed symptoms

Majority of NAFLD sample were pre diabetes (65 %), there were 27.75% had diabetes. Only few samples are in normal level. From the study by Anstee *et al*. (2011) Type 2 diabetes mellitus (T2DM) and non-alcoholic fatty liver disease (NAFLD) commonly exist together .Thus, in examining associations between Diabetes mellitus and

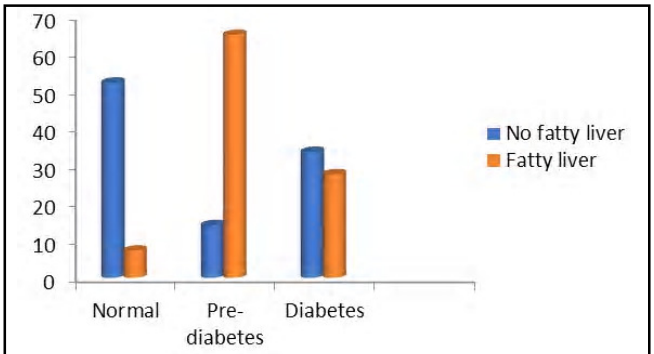

Fig. 2 : Relationship between NAFLD and diabetes mellitus

NAFLD, it is important to consider not only the occurrence of NAFLD with diabetes, but also the effects of diabetes on NAFLD progression to NASH. It has been regarded as a manifestation of the metabolic syndrome. While considering no fatty liver disease samples majority were in normal range both FBG and PPBG levels are in normal. Only few samples faced pre diabetes (Fig. 2).

Conclusion :

Non-alcoholic fatty liver disease (NAFLD) is an excess of fat in the liver. NAFLD progresses from hepatic steatosis, through inflammatory non-alcoholic steatohepatitis (NASH), to fibrosis or cirrhosis. Fatty liver disease is more common in male population from selected area of Malappuram district and also risk factors as well as co morbidities are more common. This study reveals the increased prevalence of non-alcoholic fatty liver (stage 1) to be more prevalent in 31-40 year males, suggesting that this group is at increased risk of developing cholesterol and diabetes. There were strong relationship between NAFLD and diabetes. So Promoting beneficial life style practice, effective implementation of nutritional and educational interventions on management of non-alcoholic fatty liver disease should be necessary.

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