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USG grading of fatty liver with lipid profile in south Indian population

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Abstract---The article is dealing with one of the important diseases in the modern era and people from all over the world are suffering from it. The study demonstrates the severe condition of South Indian people of India; they are enduring the pain of this disease. The main characterization of the disease is fat deposition or it can also be known as the "spectrum of liver steatosis", "inflammation "or "fibrosis". In India, people are suffering from fatty liver disease and the rate is 15% to 30%. Doctors are utilizing the Ultrasonography method to detect the images of fatty liver and after that, they prescribe medicines to treat the disease. In this context, it is necessary to conduct a lipid profile test for the patient to detect the find out threat of cardiovascular disease. The article also discusses the ultimate goal of the study and also the materials uses for the study. The result and discussion part of the study will clearly demonstrate the importance of the article and also the preventive measures for the disease. In recent years, Fatty liver can be seen as a common disease affecting human beings' lives and it can also be known as "hepatic steatosis". It can be said that the presence of little fat is normal though in this case, the quantity of fat becomes massive inside the liver. The article is mainly concerned with "nonalcoholic fatty liver" disease. There are four types of fatty liver issues that can be seen. In the case of "simple fatty liver", there can be seen deposition of fat in the liver and it can be considered quite normal. "Steatohepatitis" can be known as excessive fat in the liver and also inflammation can be seen. Another two issues that are related to NAFLD are fibrosis and Cirrhosis.

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Keywords---NAFLD, USG, cirrhosis, lipid test.

Introduction

Fatty liver can occur after consuming a huge amount of alcohol and deposition of fat can occur. Though the study is going to discuss the individuals, they do not intake alcohol a lot [1]. In order to detect the inflammation of the liver, doctors are preferring ultrasonography to obtain images of organs inside the body. In this process, they are using "high-frequency sound' to form an image of different internal organs or tissues. The article is dealing with the disease called fatty liver and the role of USG, in detecting the abnormal condition of the liver [2]. These "nonalcoholic fatty acid" diseases generally help to form cirrhosis that will help to build some severe diseases such as, "Hepatocellular carcinoma and portal hypertension". Generally, people suffering from "non-alcoholic fatty acid "disease do not reveal any symptoms and sometimes they do not show any concern about this. The study will help to awaken their consciousness about this disease, that they will take essential prevention.

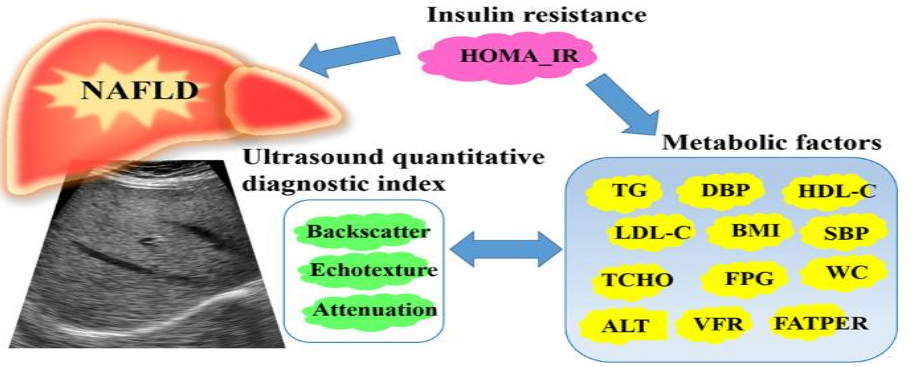

Figure 1. USG grading of fatty liver
Source: [3]

It can be seen that the disease, "nonalcoholic fatty liver" can cause severe health issues throughout the globe. There are a lot of populations from all over the world affected by the disease and the rate is near about 10-24% [3]. The article is dealing with the South Indian population and it can be found that people from that region have been affected by NAFLD and the rate is almost 15% to 30% [4]. In recent times, NAFLD detected as one of the most common issues and the rate is continuously increasing day by day. It can be seen that there are 2.6 % of children have been affected by it and it is gradually enhancing and now the rate increased from 22.5% to 52.8%. Sometimes the disease NAFLD became asymptomatic and a lack of treatment may raise type 2 diabetes mellitus in those patients. Another name for fatty liver is "hepatic steatosis "and as a result fat can gradually build up inside the human body or liver [5]. One of the most essential organs in the human body is the liver and it is responsible to extract the nutrition from food and drinks. The abnormalities in the liver may hamper the overall working procedure of the body and it has lots of chances of failure of the liver.

Therefore, it is required to treat NAFLD otherwise it may generate some risk factors such as obesity, type 2 diabetes, “high cholesterol” and others [6]. In this context, doctors prefer to use Ultrasonography to detect the condition of the liver, and then they will be able to take action. The USG can efficiently detect the condition and it has been utilized worldwide. However, in this case, ultrasonic sound waves have been used to capture the best possible images of internal organs, blood vessels, and also tissues. Mainly “diagnostic ultrasound” has been utilized by health care providers to get a clear view of internal parts of the body [7]. After detecting the abnormalities of the liver, it is required to do a lipid test that is able to calculate the overall presence of lipid molecules inside the body.

Aims and objectives

The objective of the study is transparent and those are as follows:

- To understand the role of ultrasonography in detecting fatty liver disease.
- To find out the correlation grade of fatty liver and the “lipid profile” test.
- To raise awareness about “nonalcoholic fatty liver” disease among individuals from all over the world.
- In order to find out the threatening component of fatty liver disease and the best possible treatment for that disease.

Materials and Method

The design of the study can be considered a “noninterventional prospective observational study”. The issue of fatty liver can be observed in the case of both males and females from South India.

Inclusion criteria

- The age of the patients must be above 18 years old.
- In some cases, patients should not have a history of alcohol intake.
- Selected patients are required to be completed their lipid profile test from the biochemical laboratory of institutes.[8]

Exclusion criteria

- One of the most important exclusion criteria is patients; they are not prepared for the study.[9]
- The age of the patients must be less than 18 years.
- Patients must have “focal liver mass liver lesion”.

Materials utilized for this study are “Philips HD11 or Seimens Acuson x 500” and in this method, every patient should be detected with “Trans abdominal ultrasound” and the coupling agent may be “water soluble gel” [10]. In this study, an ultrasound examination should be done to check the patient's condition and a regular update of the condition is required. Before doing the ultrasound process, patients need to lie down and then sonogel can be spread on their abdomen portion [11]. The movement of the transducer is required, it moves from the right

portion to the left portion of the patient's abdomen and after that, the structure can be studied properly. In this context, it is necessary to provide important data about lipid profiles and including "total cholesterol", "HDL", "LDL", and "Triglycerides" of the patients. "Sphygmomanometer" should be utilized to evaluate the blood pressure of those patients.

Results

Total 100 patients have been taken for the analysis they are separated into three grades and the analysis have done on the basis of Sonographic test.

Grade			Age	TG	TC	HDL	LDL
Grade I	N	Valid	48	48	48	48	48
		Missing	0	0	0	0	0
	Mean		49.42	151.44	185.17	44.79	95.31
	Median		52.00	145.50	178.00	45.00	90.00
	Std. Deviation		12.228	26.024	26.635	12.181	17.424
	Minimum		24	110	148	26	76
	Maximum		70	190	246	68	146
Grade II	N	Valid	41	41	41	41	41
		Missing	0	0	0	0	0
	Mean		52.56	208.85	207.76	35.80	111.00
	Median		52.00	216.00	214.00	34.00	97.00
	Std. Deviation		10.633	41.477	34.760	9.948	26.302
	Minimum		33	126	156	20	79
	Maximum		70	304	268	56	164
Grade III	N	Valid	11	11	11	11	11
		Missing	0	0	0	0	0
	Mean		53.27	262.09	228.91	26.36	124.64
	Median		54.00	265.00	240.00	24.00	134.00
	Std. Deviation		6.901	18.523	38.788	5.644	29.558
	Minimum		44	214	156	20	88
	Maximum		64	286	270	36	160

In this method, grade 1 contains 48 patients and grade 2 contains 41 patients and grade 3 contains 11 patients. In case of grade 1, the mean value is 49.42, median value 52.00 and st. deviation is 12.228. The maximum HDL value in case of medium is 26 and LDL is 76. The maximum value of HDL is 68 and maximum value of LDL is 146. In case of grade II the mean value is quite high, and it is 52.56, 208.85, 207.76 and the median value is 52.00, 216.00, and 214.00. The minimum value for grade II for HLD is 20 and LDL is 79. In case of maximum value for grade 2 is, HDL 56 and LDL 164. In case of grade III mean value is 53.27, 262.09 and 228.91 and, median value is 54.00, 265.00, and 240.

Comparison of liver function tests according to fatty liver grade					
	Grade I	Grade II	Grade III	P Value	
TG-Levels	151.44±26.024	208.85±41.477	262.09±18.523	.000	<0.0001*
TC	185.17±26.635	207.76±34.760	228.91±38.788	.000	<0.0001*
HDL	44.79±12.181	35.80±9.948	26.36±5.644	.000	<0.0001*
LDL	95.31±17.424	111±26.302	124.64±29.558	.000	<0.0001*

For grade I , the TG level is near about 151 and grade II is about 200 and grade III is about 260. The TC value for grade I is about 185, the value of grade II is 207 and grade III is 228. The HDL value for grade I is 44 and grade II is 35 and grade III is 26. The LDL for grade I is 95 and grade II is 111 and grade III IS 124.

Tests of Normality							
	Kolmogorov-Smirnov[a]			Shapiro-Wilk			
	Statistic	df	Sig.	Statistic	df	Sig.	
Age	.072	100	.200*	.977	100	.074	Normal
TG levels	.114	100	.003	.954	100	.001	Non-Normal
TC	.157	100	.000	.928	100	.000	Non-Normal
HDL	.165	100	.000	.940	100	.000	Non-Normal
LDL	.255	100	.000	.838	100	.000	Non-Normal

The statistical value for Kolmogorov-Smirnov, the age is .072, the df value is 100, the sig is .200. The value of TG level is .114, df is 100, Sig is .003. HDL value is .165, df is 100, Sig is .000. The LDL value is .255, df is 100 and sig value .000. In case of Shapiro-Wilk, the statistic value is .977, df value is 100 and sig value .074. The HDL and LDL statistical value is .940 and .838.

Discussion

The nonalcoholic fatty liver disease can be considered as one chronic disease and it can be characterized by the accumulation of hepatic lipids inside the body. The study is mainly focused on the pathobiology of hepatic steatosis. In this condition, the liver is concentrating on maintaining the balance between “non esterified fatty acid and de novo lipido genesis. There are several kinds of lipids present that cause the formation of fatty liver that including Triglycerides, HDL, and LDL [12]. NAFLD can be considered a hepatic syndrome and it generates the risk factors for dyslipidemia and hypertension. The liver does not have any place to store fats, therefore excessive deposition of fat cause fatty liver. The deposition of fatty acids can occur due to irregular fasting and improper feeding. These fatty acids can be absorbed from the area of the small intestine, then it congregate into triglycerides and includes in chylomicrons [13]. The excess fatty acids are deposited in the adipose tissue and it is near about 70%. The liver then accumulates the rest of the fatty acids and this kind of incident repeatedly occurs inside the human body. After that those fatty acids must synthesize in the liver and it will generate a few

more fatty acids such as glycolipids, sterols, and glycerophospholipids [14]. In other words, sometimes those fatty acids return back to the liver from the area of adipose tissue. Therefore, some non alcoholic individuals are also affected by NAFLD and Triglycerides are the main lipid component that is co-related with fatty liver disease. Please compare with other studies in discussion part.

Conclusion

The article is dealing with one of the severe diseases called fatty liver and the role of USG in detecting the condition of the liver. Doctors are also doing lipid tests to identify the number of lipids inside patients' bodies. The symptoms of the fatty liver may not reveal easily and people may easily ignore the disease. After sometimes they can be affected by obesity and a high cardiovascular risk may be generated. The term NAFLD can be defined as excessive deposition of fat in the liver and the liver may stop functioning properly. Therefore, doctors are preferring to use ultrasonography to capture the perfect images of the internal organs of the patient's body. In this technique, an ultrasound may be used to detect the disease and the study has included both male and female patients. It can also be seen that fibrosis and Cirrhosis are also associated with NAFLD. There are no proper treatments that can be found for this disease and doctors are suggesting to take a proper and healthy diet or nutrition. Apart from that routinely aerobic exercise will help to mitigate the issue of fatty liver. Patients suffering from the disease should check their lipid profile routinely to get an overview of their health condition.

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