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Research Article

**A CASE SERIES STUDY TO ASSESS THE CAROTID INTIMA-MEDIA THICKNESS AMONG 218 NON-ALCOHOLIC FATTY LIVER DISEASE (NAFLD) PATIENTS**Dr. Laeq Ahmad, Dr. Muhammad Umair Javed, Dr. Muhammad Babar Mushtaq  
Services Hospital Lahore**Abstract:**

**Objective:** This study aimed to evaluate the carotid intima-media thickness among the patients of non-alcoholic fatty liver disease.

**Materials & Methods:** This study is a case series research in its design and we completed this research at Services Hospital, Lahore (February to October 2017). The study encapsulated two hundred and eighteen numbers of cases-one hundred and nine were group cases, whereas, one hundred and nine were individuals. The study aimed to evaluate Carotid intima-media thickness in instances of non-alcoholic fatty liver disease.

**Results:** This study split the research population into two groups and the age for cases group stretched in the mean range of  $(37.51 \pm 4.07)$  years. Whereas, the other group, which they considered as a control group, have the mean age of  $(37.45 \pm 4.03)$  years. The research population contains one hundred and thirty-six males (total of 62.39%) and eighty-two are females (total of 37.61%). Moreover, the ratio with a male to female is (1.7: 1). Sixty-two patients (56.88%) from cases group and forty-one patients (37.61%) from the control group presented frequency of raised CIMT. The value of *P* is (0.004) and odds ratio is (2.1879) that has numerical importance and portrays a positive correlation between raised CIMT and NAFLD.

**Conclusion:** This research lucidly examined that the ratio of raised carotid intima-media thickness is greater among patients with a non-alcoholic fatty liver illness that projects the affirmative correlation between nonalcoholic fatty liver disease (NAFLD) and raised CIMT.

**Keywords:** Liver, Alcohol, Fatty, Carotid, NAFLD and CIMT.

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**INTRODUCTION:**

Fats in the liver cell cause nonalcoholic fatty liver disease (NAFLD) that has become so common condition among the clinical cases [1]. Nonalcoholic fatty liver disease (NAFLD) incorporates a continuum of an immunological disorder, oscillating from naive steatosis to cirrhosis and nonalcoholic steatohepatitis (NASH) [2]. It bears the resemblance with alcoholic infected liver but it appears in the persons who do not misuse alcohol [3]. Therefore, NAFLD allocates many attributes of metabolic disorders, an extremely atherogenic state, and the presence of NAFLD has the probability to magnify an ample cardiovascular jeopardy that is far above the other individual factors [4]. Moreover, NAFLD itself a factor affecting the condition. It enhances the death ratio and morbidity. It creates a cardiovascular disorder with malignancy [5]. Apart from these sound grounded facts, many sufferers have an adequate prognosis, in the case of early diagnosis. Past research-based data claim that the death rate for coronary heart disorder among the sufferers with NAFLD is similar to fatalities associated to cirrhosis [6]. It is necessary to decide whether NAFLD alone is the factor of cardiovascular morbidity and fatalities. In this regard, many types of research have advocated that there is a clear correlation between cardiovascular disorder and NAFLD [7]. Some researchers believe that NAFLD is the root factor that affects the adults' abnormal liver function. Unfortunately, no research proposed the findings on the function of carotid atherosclerosis among the patients of NAFLD. In addition to the said need, this kind of study become inevitable so that it could originate in case of atherosclerosis influences vascular features and structure in NAFLD patients, autonomous from sub-risk factors. Owing to the current study concerned issue, it will make it possible to draw the portion of the association. Through this study, we would be able to find the relation between carotid intima-media thickness and nonalcoholic fatty liver disorder that is the forecaster of cardiovascular disease [8-9]. This research would endeavour to bestow reference and contemporary numerical findings of a correlation between raised CIMT and NAFLD. This research would also elucidate the recommendations for anticipated treatments regarding CIMT whether to practice it in NAFLD patients or not. Consequently, this study is beneficial for the clinical planning and implementation of exercising techniques.

**MATERIAL AND METHODS:**

This study is a case series research in its design and we completed this research at Services Hospital, Lahore (February to October 2017). To select the

research population, researchers conducted the ultrasound with HbsAg -ve, Anti HCV -ve. The researchers selected the patients, who recorded nonalcoholic fatty liver disease. These (109) patients ranged from thirty to forty-five years of age. These patients fell in the control group. Moreover, researchers preferred to take the affected instances those who are relatives. The abdominal ultrasound displayed normal liver echogenicity. This research did not include the patients with diabetes, hypertension, patients who have a regular timeline of heart disease, timeline of severe liver disorders, patients who consume alcohol, and smoke more than (20) cigarettes a day, females who had experienced pregnancy in the previous year or have borne a baby in the recent six months and affirmative viral markers. Researchers also seek the sanction from the ethical committee of the institute. Moreover, investigators took the informed written consents from each patient individually.

NAFLD is the detection of some abnormal symptoms explored with the help of ultrasound in which echogenicity results in the lever that is to be greater in size than spleen or kidney and when a certain amount of alcohol is removed it should produce vascular distortion and profound attenuation of ultrasound beep [1]. Carotid intima-media thickness: researchers ensured extreme anticipated IMT along the posterior surface wall of the common carotid artery, the distance was (2cm) were first and second echogenic lines of anterior and posterior arterial walls split. The researcher noted three different measurements at all three stages and found the mean value [2]. So, they set the value (0.8 mm) for CIMT as the cut-off value.

To discover nonalcoholic fatty liver disease and increased carotid IMT, examiners took the abdominal and carotid ultrasound of all the patients. They conducted this activity at the Radiology Department and used quality passed standardized machinery. Sonologists performed all the laboratory work. Moreover, researchers never took interest to check out the acquired data of any patient in their presence and remained unbiased. Laboratory consultants examined the ultrasounds in the supine position. They extended the necks of patients by turning the chin in contralateral position. Much quantity of CIMT accumulated along the posterior wall of the common carotid artery. Researchers used a Chi-square test to examine the relationship between raised CIMT and NAFLD and the value of P was ( $\leq 0.05$ ). Investigators make the strata to control the factors, for instance, age, gender and BMI.

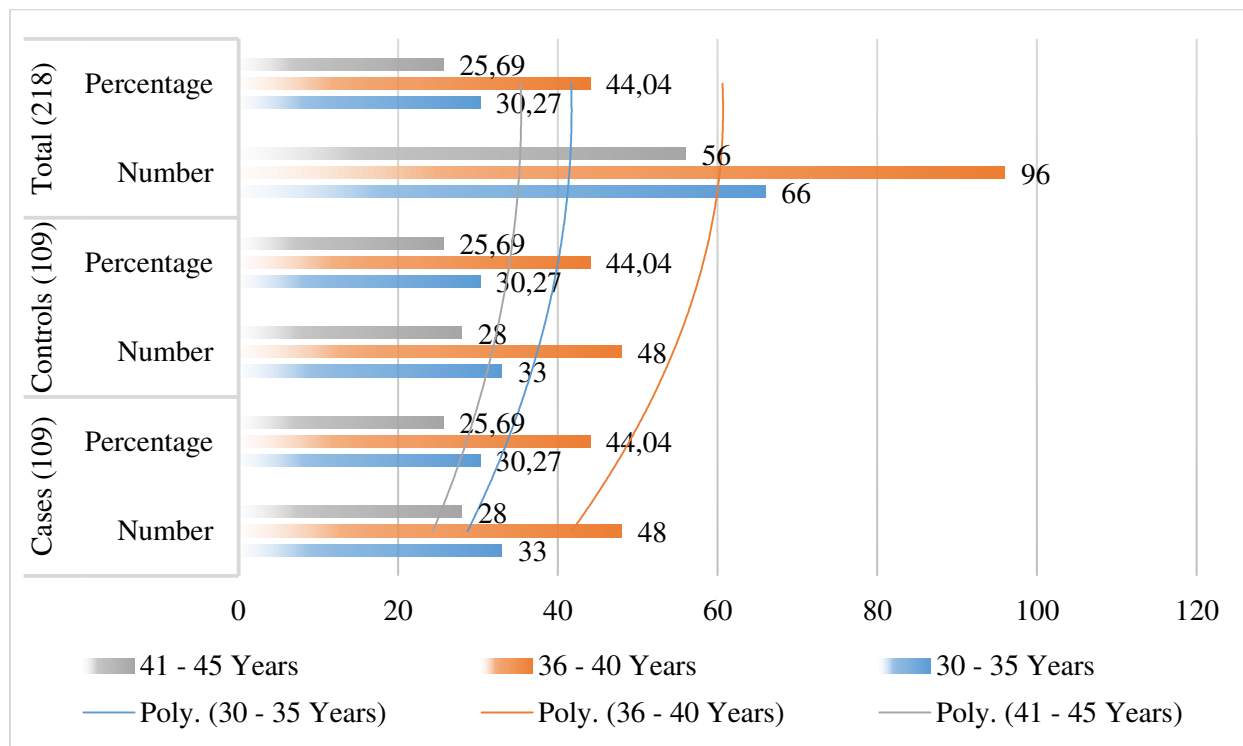
**RESULTS:**

The age of patients ranged from (30 to 45) years in this research and the mean age was ( $37.48 \pm 4.04$ ) years. On the other hand, for the case group, the mean age was ( $37.51 \pm 4.07$ ) years. Whereas, this is ( $37.45 \pm 4.03$ ) years in individual cases. Ninety-six patients lied in the range of (36 – 40) years of age that was the major part of the population. In cases group, the mean BMI was ( $29.64 \pm 4.19$  kg/m<sup>2</sup>), whereas, in the control group, it was ( $29.62 \pm 4.53$ ).

Total male patients were one hundred and thirty-six (62.39%) and females were eighty-two (37.61%). Therefore, the ratio of a male to female is (1.7: 1). In the case group, the recurrence of raised CIMT was in sixty-two (56.88%) patients. Consequently, forty-one cases have shown this tendency with a p-value of (0.004). It made a significant agreement between raised CIMT and NAFLD. All the data of these association between NAFLD and raised CIMT is as under.

**Table – I: Age Wise Distribution**

Age	Cases (109)		Controls (109)		Total (218)	
	Number	Percentage	Number	Percentage	Number	Percentage
30 - 35 Years	33	30.27	33	30.27	66	30.27
36 - 40 Years	48	44.04	48	44.04	96	44.04
41 - 45 Years	28	25.69	28	25.69	56	25.69

**Table – II: Age Wise (Mean ± SD)**

Age	Cases (109)		Controls (109)		Total (218)	
	Mean	±SD	Mean	±SD	Mean	±SD
Mean ± SD	37.51	4.07	37.45	4.03	37.48	4.04

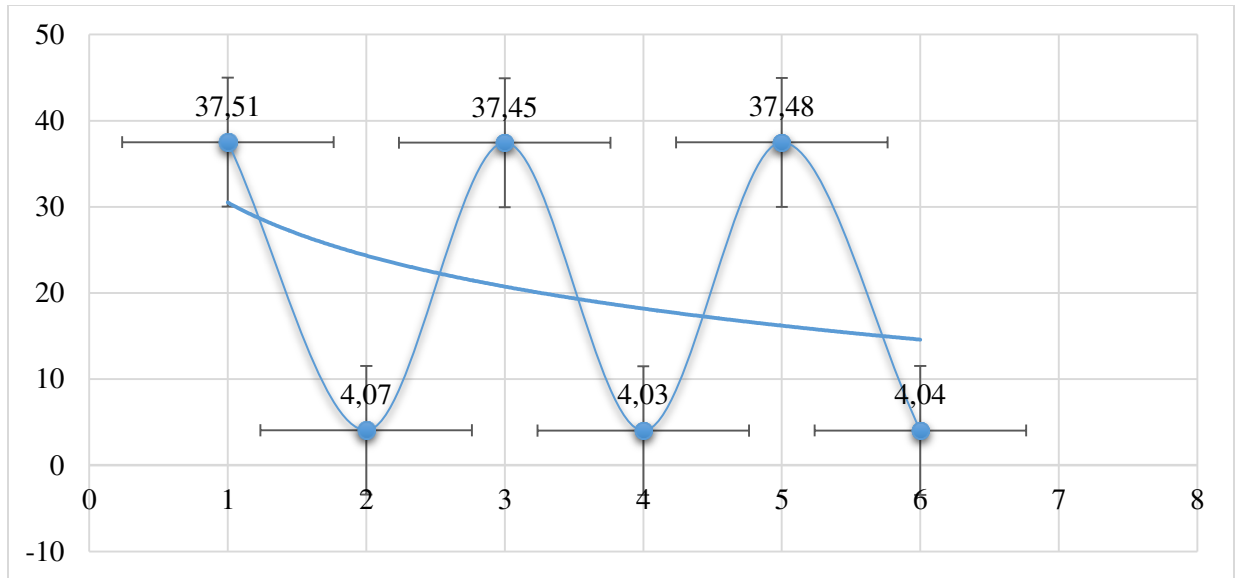


Table – III: Group Wise BMI Distribution

BMI	Cases (109)		Controls (109)		Total (218)	
	Number	Percentage	Number	Percentage	Number	Percentage
≤ 30 (kg/m <sup>2</sup> )	61	55.96	61	55.96	122	55.96
> 30 (kg/m <sup>2</sup> )	48	44.04	48	44.04	96	44.04
Total	109	100	109	100	218	100

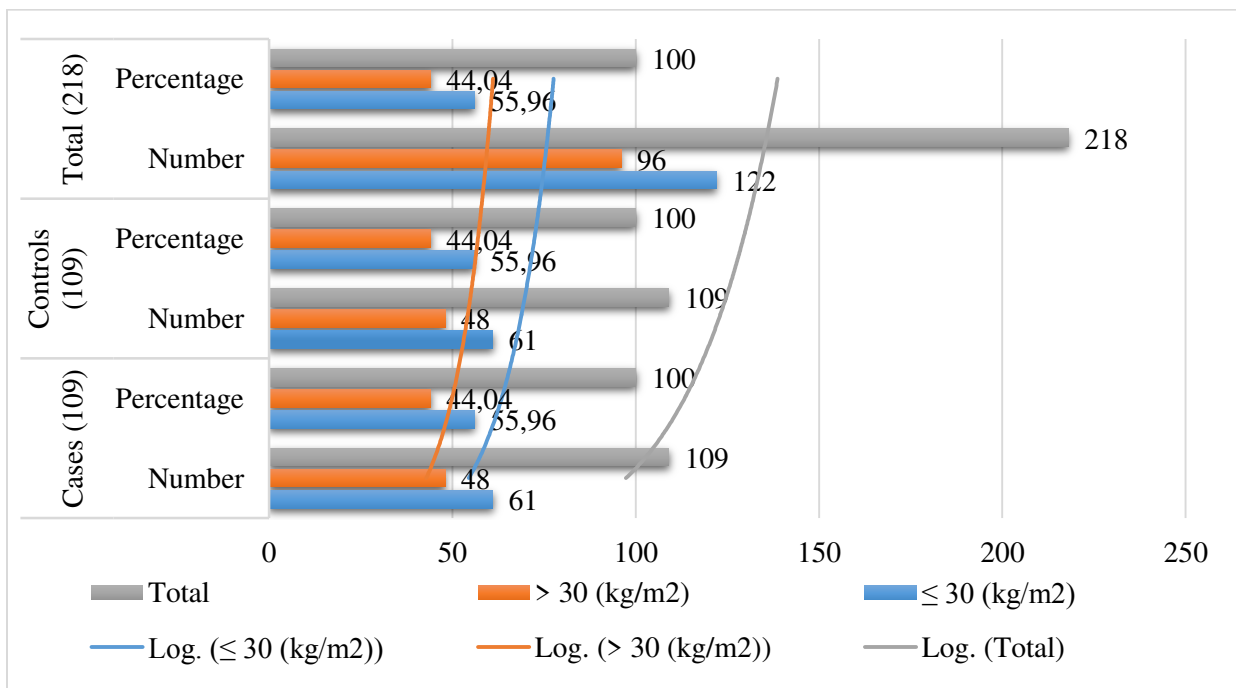


Table – IV: Group Wise BMI (Mean  $\pm$  SD)

BMI	Cases (109)		Controls (109)		Total (218)	
	Mean	$\pm$ SD	Mean	$\pm$ SD	Mean	$\pm$ SD
Mean $\pm$ SD	29.64	4.19	29.62	4.53	29.63	4.35

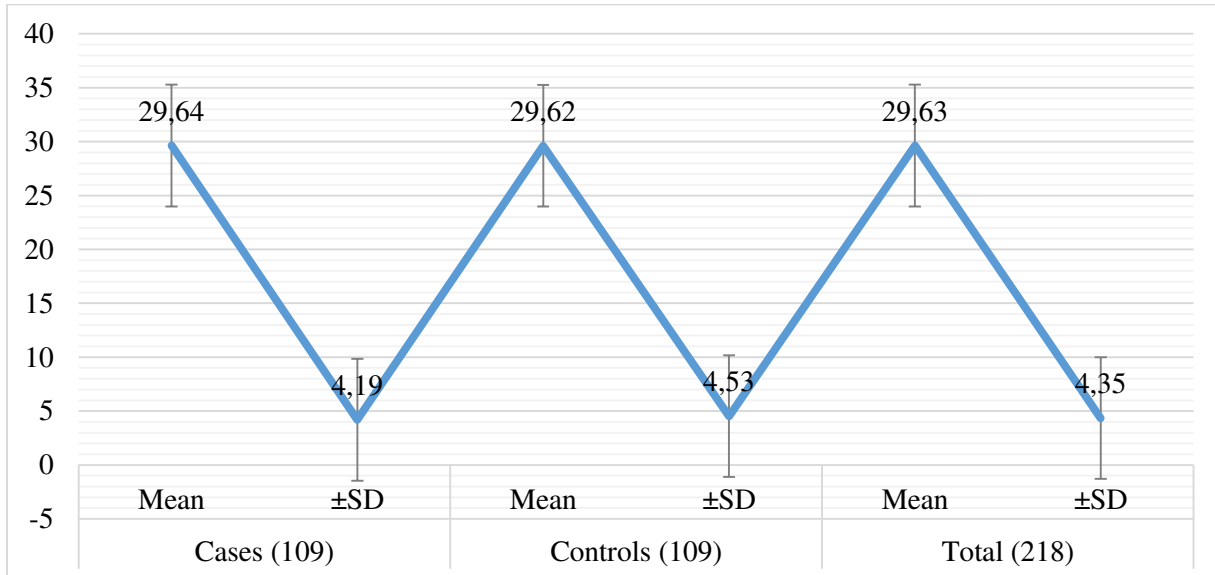
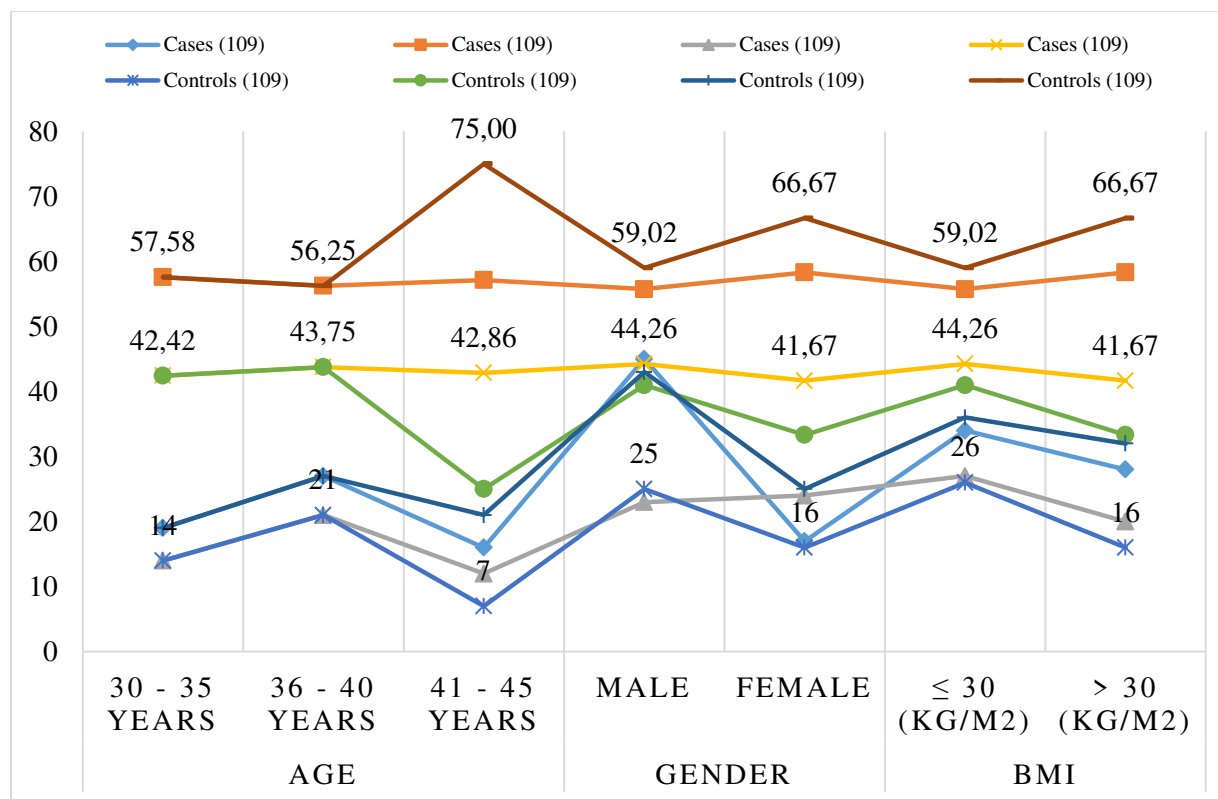


Table – V: Gender, BMI and Age Stratification

Gender, BMI and Age		Cases (109)				Controls (109)				P-Value	OR
		Yes		No		Yes		No			
		No	%	No	%	No	%	No	%		
Age	30 - 35 Years	19	57.58	14	42.42	14	42.42	19	57.58	0.22	1.840
	36 - 40 Years	27	56.25	21	43.75	21	43.75	27	56.25	0.221	1.650
	41 - 45 Years	16	57.14	12	42.86	7	25.00	21	75.00	0.017	4.000
Gender	Male	45	55.74	23	44.26	25	40.98	43	59.02	0.0007	3.360
	Female	17	58.33	24	41.67	16	33.33	25	66.67	0.8219	1.120
BMI	$\leq$ 30 (kg/m <sup>2</sup> )	34	55.74	27	44.26	26	40.98	36	59.02	0.104	1.810
	> 30 (kg/m <sup>2</sup> )	28	58.33	20	41.67	16	33.33	32	66.67	0.015	2.800



### DISCUSSION:

Researchers administered this research to calculate the correlation nonalcoholic fatty liver disease (NAFLD) and raised CIMT (carotid intima-media thickness). For this purpose, they covered the age group from thirty to forty-five years for their research population and drew the mean age as  $(37.48 \pm 4.04)$  years. For case group, mean age was  $(37.51 \pm 4.07)$  years, however, for the control group it was  $(37.45 \pm 4.03)$ . a major part of the population belonged to (36 – 40) years of age those were ninety-six. These ranges of ages, coincide the work of Guleria and Zayed who determined the mean age as thirty-seven to thirty-nine. Contrastingly, there are many other research reports who presented a greater mean age that is more than fifty years [10 – 11]. In some earlier researches NAFLD, the number of female patients was much greater like more than (75%). However, in some recent researches, this ratio showed decline as near to (50%). Whereas, in this research, roughly sixty-three percent were males and roughly thirty-seven were females. So, with a male to female ratio is (1.7: 1). Males dominated on females in many past researches as well [12 – 13]. This research revealed the occurrence of raised CIMT in cases group in sixty-two (56.88%) whereas this number is forty-one (37.61%) in the control group. The patients have shown P-value of (0.004) and an odds ratio of (2.1879). One of the renowned researches coded that,

(52.5%) cases of CIMT. In this regard, Zayed coded a noticeable involvement between enhanced CIMT and NAFLD. Notwithstanding the realities, revealed from the earlier researches which projected and put emphasis on the association in the relation between CIMT and NAFLD, in the screening of carotid in a set pattern no generalized agreement survives. Moreover, all the patients who have NAFLD will have an increased amount of carotid IMT not only bearing high threatening treatment of the liver disorder but they would observe low cholesterol level in collaboration with increased medication of existing CVD risk element. Resultantly, it would sort out to transform and possibly decrease the worldly CVD risk of patients suffering the said disease.

### CONCLUSION:

This research accomplished that the occurrence of raised CIMT (carotid intima-media thickness) exists greatly among the patients with NAFLD (non-alcoholic fatty liver disease) and exhibit the affirmative collaboration between nonalcoholic fatty liver disease and raised CIM thickness. Therefore, investigators acclaim that Carotid IMT screening is necessary for all non-alcoholic FLD patients. And consultants and doctors must treat the patients with enhanced CIMT assertively. This should not only benefit liver disease but it must extend for underlying CVD hazardous elements. As a result, it would

suppress the morbidity and fatalities of these high affected patients by the risk.

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