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CORELATION BETWEEN FIBROSCAN AND ULTRASOUND IN PATIENTS WITH FATTY LIVERS OF VARIOUS GRADES IN OUR CENTRE FROM SEPTEMBER 2017-JANUARY 2018

Gastroenterology

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ABSTRACT

AIM To find the correlation between fibroscan and ultrasound in screening severity of liver diease in patients with fatty liver.

MATERIALS A cross-sectional study was conducted in patients with underlying liver diseases of various etiologies from November 2017-January 2018.100 patients were screened with fibroscan and ultrasound and comparison was drawn between them. This was based on the observation made from previous studies that sensitivities of fibroscan compared with liver biopsy of various etiologies was found to be 26% for F1(6 kpa),84.6% for F2(7 kpa), 96% for F3 (9.5 kpa) and 86% for F4(12.5kpa).ultrasound results varied from normal to fatty livers of grades 1,2 and 3.This study was based on previous studies done which sowed sensitivity of fibroscan compared with liver biopsy of between 80%-86%.

Results: Ultrasound of patients not amounting to cirrhosis was compared with fibroscan , a correlation was made.There was a significant correlation between increasing grades of fatty liver by ultrasound values and fibroscan(p value<0.01).There was statistically significant difference(p=0.01) between those normal by ultrasound as fibroscan showed values similar to grade 3 fibrosis by ultrasound. There was significant difference among those with grade 1 fatty liver showing values of mean of 8.5kpa by fibroscan(P =0.0005).Among patients with grade 2 fatty liver , significant difference (p <0.003) was found ,as fibroscan revealed values
corresponding to those of fatty liver grade 3 of mean of 9.5kpa.

Among patients with grade 3 fatty liver, no significant differance was found comparing to fibroscan values (p=0.03).Overall, there was a significant difference between the fibroscan values and grades of fatty liver.

KEYWORDS

The collected data were analysed with IBM.SPSS statistics software 23.0 Version.To describe about the data descriptive statistics frequency analysis, percentage analysis were used for categorical variables and the mean & S.D were used for continuous variables. To find the significant difference in the multivariate analysis the one way ANOVA with Tukey's Post-Hoc test was used.To assess the relationship between the variables Pearson's Correlation was used. In all the above statistical tools the probability value .05 is considered as significant level.

P - Value ** Highly Significant at P ≤ .01

P - Value * Significant at 0.01 < P ≤ .050

P - Value # No Significant at P >.050

ANOVA

fibroscan

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3787.563	3	1262.521	12.016	.0005
Within Groups	10086.871	96	105.072		
Total	13874.433	99			

Post Hoc Tests					
Multiple Comparisons					
Dependent Variable: fibroscan Tukey HSD					
(I) USG	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
				Lower Bound	Upper Bound
Normal	Grade I	1.5394	4.4609	.986	-10.124
	Grade II	-4.5990	4.5602	.745	-16.522
	Grade III	-15.4222*	4.8321	.010	-28.056
Grade I	Normal	-1.5394	4.4609	.986	-13.203
	Grade II	-6.1384	2.3815	.055	-12.365
	Grade III	-16.9616*	2.8680	.0005	-24.460
Grade II	Normal	4.5990	4.5602	.745	-7.324
	Grade I	6.1384	2.3815	.055	-.088
	Grade III	-10.8233*	3.0201	.003	-18.720
Grade III	Normal	15.4222*	4.8321	.010	2.788
	Grade I	16.9616*	2.8680	.000	9.463
	Grade II	10.8233*	3.0201	.003	2.927

*. The mean difference is significant at the 0.05 level.

METHODS:

Patients with various grades of fatty liver of various etiologies like alcoholic liver disease ,non-alcoholic fatty liver,chronic hepatititis B abd C ,Wilson were subjected to fibroscan for assessing the presence of fibrosis and cirrhosis.Prior to fibroscan,Liver function test was done to rule out active hepatitis ,and any evidence of cholestasis and those with ultrasound of the abdomen showing ascites or space occupying lesion or those with morbid obesity were eliminated.A statistical analysis was made.

DISCUSSION:

The Fibroscan device works by measuring shear wave velocity. It consists of a probe mounted on the In this technique, a 50-MHz wave is passed into the liver from a small ultrasound probe . A transducer is mounted on the equipment on the end that can measure the velocity of the shear wave (in meters per second) as this wave passes through the liver.Liver stiffness is calculated in kilopascals as measured by the stiffness of the liver through which the wave passes.it gains importance being a non-invasive method.Liver biopsy has always been considered the gold standard to stage fibrosis in the liver,and to detect cirrhosis.It finds importance when we need to evaluate patients with chronic viral hepatitis caused by hepatitis B and hepatitis C ,where we have to stage the disease, to determine whether treatment must be initiated or if the patient needs close monitoring for surveillance. The disadvantages of liver biopsy are that it calls for hospital stay especially in places where access to healthcare may be difficult and to monitor for complications like pleuritic, peritoneal or diaphragmatic pain and hematomas or major complications like bleeding or pneumothorax. Additionally, liver biopsy samples may not be representative of the rest of the liver. Hence overstaging or understaging of fibrosis or cirrhosis may be possible; with an additional sampling error in around 25-30% of liver biopsies.

To circumvent these problems ,many noninvasive tests have come into role to ascertain the fibrosis or cirrhosis .some of them are fibroscan,hepascore,fibrotest,fibrospect ,fibrosure,FIB 4 and European liver fibrosis test .As Fibroscan is a noninvasive test, which is performed at the point of care, as an outpatient procedure , and shows comparable precision to biopsy ,it gains grounds. The test can be performed without any sedation ,giving immediate results which enables the clinican to revise his treatment plan.

Technical limitations to fibroscan are ascites ,morbidly obese individuals or those with a thick chest wall in which case ,the test cannot be performed or the results are not reliable.

Fibroscan has been submitted to the US Food and Drug Administration (FDA) for approval.

Several other noninvasive methods can be used to measure liver stiffness, including both radiologic tests and serum biomarker tests. One such method is (MR) elastography,which has a higher accuracy for measurement of liver stiffness,hoever the patients need to undergo an MR imaging,and which may not be readily available at the point of care.Acoustic resonance force impulse testing is another radiologic method for measuring liver fibrosis, but this method is still undergoing evaluation and has not yet been broadly adopted for clinical use either in the United States or Europe.

Several studies have evaluated the efficacy of these serum biomarker tests, both in terms of how they compare to Fibroscan and how they perform when used in combination with Fibroscan. However ,when it comes to stage like Metavir stage 2,liver biopsy has an upper hand over fibroscan.Therefore, Fibroscan and serum biomarker testing could be used in combination to exclude patients with cirrhosis, which would allow many patients to avoid biopsy: Patients who were shown to have cirrhosis would require appropriate screening with endoscopy and ultrasound for liver cancer, while patients without cirrhosis could proceed with treatment.Particularly in patienst with chronic viral hepatitis B or C,the presence of elevated values like 12.5kpa calls for close surveillance and initiation of antivirals ,failing which th epatiet might decompensate or develop a hepatocellular malignancy. FibroScan® results range from 2.5 kPa to 75 kPa. Between 90–95% of healthy people without liver disease will have a liver scarring measurement <7.0 kPa (median is 5.3 kPa).

Values between 7.5 and 12.5 indicate fatty livers of variable severity and call for close monitoring.

Here are some of the pitfalls of the test.

Table 1. Possible reasons for an over-estimation of fibrosis using FibroScan®
• Liver inflammation (eg. active hepatitis) • Cholestasis (eg. biliary obstruction) • Mass lesions within the liver (eg. tumour) • Liver congestion (eg. heart failure)

In a patient with chronic hepatitis C a liver stiffness of >14 kPa has approximately a 90% probability of having cirrhosis, while patients with liver stiffness >7 kPa have around an 85% probability of at least significant fibrosis.[9,10] However, the sensitivity and specificity of readings >7 kPa for significant fibrosis are only 79% and 78% respectively.10in patients with chronic liver disease, indicating that FibroScan® cannot completely exclude the possibility of significant liver disease even if the liver stiffness is <7 kPa.

CONCLUSION

Fibroscan is more sensitive than ultrasound and is more usefull than it ,especially in patients with chronic hepatitis B when treatment initiation is warranted and for the detection of cirrhosis which calls for surveillance for malignancies.

In summary, ultrasound elastography will separate patients with minimal or no fibrosis from those with advanced fibrosis or cirrhosis, although it may occasionally underestimate fibrosis in some patients with advanced fibrosis or macronodular cirrhosis.

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