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Physiologic Staging with HEPATIQ Predicts Cirrhosis Better Than Shear Wave Elasticity

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HYPOTHESIS

HYPOTHESIS: SWE is a poor estimate of hepatic function by HEPATIQ and less effective in detecting cirrhosis.

AIMS

Identify a cohort of patients with established cirrhosis © or non-cirrhosis (NC) to determine the ability of shear wave velocity (SWV) and estimated METAVIR fibrosis score (eMFS) to detect cirrhosis in comparison to HEPATIQ physiologic staging (PHM and fSV).

METHODS

1. US and SWV: All patients had a fasting US (GE LOGIQ E9) with SWE per manufactures instructions: shear wave velocity (SWV) and estimated METAVIR fibrosis score (eMFS: 0-4) were recorded. Surface nodularity, spleen length (SL) (cm) and ascites were recorded.
2. Clinical data was abstracted from the records.
3. HEPATIQ automated quantitative liver spleen scan (QLSS) (Hepatiq_inc), meal 1-1 ½ hr before scan, can of Ensure at the radiology, injection 99Tc sulfur colloid, SPECT reconstruction and image processing by HEPATIQ for perfused hepatic mass (PHM), functional spleen volume (fSV) and functional Liver volume (fLV).

		UA	C	NC
SWE unable			3	3
HCV	Active		2	19
	SVR	2 *	10	25
HBV	Active			21
	Tx		1	9
ALD	Active		3	2
	Abstinent		3	
ACAH	Pre-Tx			0
	Tx		2	4
CC		2	11	
PBC			1	6
NASH		2	8	26
LT inactive				4
Acute LD				6
normal				7
misc			2	13
NC-splenomegaly				2
total			46	147

PATIENTS

1. 193 sequential patients with US for HCC screening and/or initial evaluation of CLD had US with SWV: 147 NC and 46 C
2. Liver Disease: see table
3. Cirrhosis was defined based on current biopsy (LBx), distant prior LBx with continuing active liver disease, evidence of portal hypertension or nodular liver surface by MRI/CT, present or past ascites/variceal bleeding/HE due to CLD and those on liver transplant list.
4. SWE was successful in 187/193 (3.2% unsuccessful) and HEPATIQ was successful in all patients.
5. C categories based on clinical problems (ascites, VB, HE): **C1**: never had, **C2** : had previously and recovered, **C3**: present requiring treatment,, and **C4**: on LT list. Most C patients had never had clinical problems or had recovered with Rx compatible with a unique population of early cirrhosis.

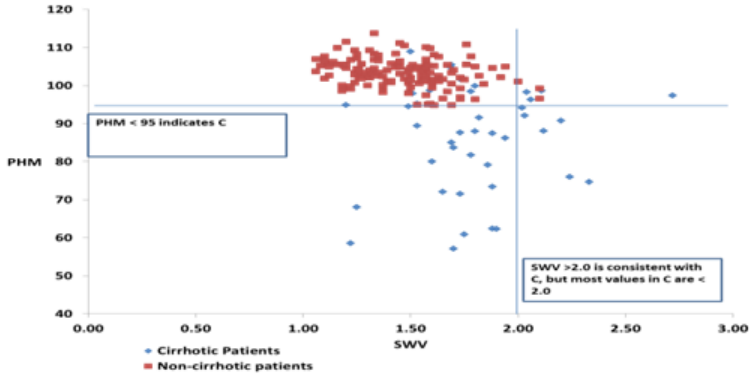
RESULTS

PHM and fSV correlated with cirrhosis and decompensation (C3/C4) whereas SWV did not.

	Varices	Platelet	INR	Bilirubin	creatinine
		X1000		Mg%	Mg%
NC	144	222(70)	1(.1)	.7(.8)	.9(.6)
C1	7/15	146(62)	1.1(.1)	1.4(1.5)	1.0(.4)
C2	13/15	129(57)	1.1(.1)	1.0(.6)	1.2(.6)
C3	8/9	94(52)	1.2(.2)	1.7(1.3)	.9(.2)
C4	3/3	51(29)	1.4(.3)	3.3(1.7)	.8(.2)

	#	SWV	PHM	fSV	PHM<95
			N 100-110	N <2.5	
NC	144	1.5(.2)	103(3.7)	1.5(1.0)	0/144
C1	15	1.8 (.2)	94(8)	4.3(2.4)	9/15
C2	15	1.9 (.3)	90(10)	3.1(1.6)	9/15
C3	10	1.8 (.3)	77(11)	5.5(3.2)	10/10
C4	3	1.6 (.3)	59(2)	8.2(6.0)	3/3

Scattergram of SWV vs PHM in C and NC: SWV did not correlate with quantitative liver function (PHM). PHM < 95 indicated C.



CONCLUSIONS

1. SWV correlated poorly with cirrhosis even in those with decompensation (C3 and C4).
2. SWV did not correlate with quantitative hepatic function and is not a surrogate marker for function
3. PHM correlated with Cirrhosis and decompensation (C3 and C4).
4. Functional staging with Hepatiq is superior to SWE.