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Statistical agreement between ultrasound (US) and computerized tomography (CT) for non-alcoholic liver disease (NAFLD) diagnosis

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Purpose of the Study

To assess K statistic of non-invasive imaging evaluations to diagnose NAFLD by means of US fatty liver indicator (FLI) score and liver to spleen attenuation ratio by CT.

Methods

Cross-sectional observational study that included all consecutive HIV-infected patients seen at a metabolic clinic who were screened for NAFLD with US and CT in the same day. HCV, HBV and heavy alcohol users (>20 g/day) were excluded. With CT, NAFLD diagnosis was defined with an L/S<1.1. US scanning was performed by a single operator. Presence and severity of steatosis was evaluated by a semiquantitative echographic score (FLI) graduated from 2 to 8. "Sine qua non" condition for the diagnosis of steatosis was the presence of liver/kidney contrast, graduated as mild/moderate (score 2) and severe (score 3). Additional criteria (score 1 each) included posterior attenuation of ultrasound beam, vessel blurring, difficult visualization of gallbladder wall or diaphragm and areas of focal sparing. US NAFLD was diagnosed by the score ≥2.

Table 1:

	Total	NAFLD+ CT	NAFLD+ US	P-value
Male	34 (73.91)	9 (100)	16 (69.57)	.002*
Age, (range)	47.91 (25; 68)	49.55 (37; 57)	48.39 (33; 67)	.71§
CCD C, n (%)	9 (19.57)	3 (33.33)	5 (21.74)	.45*
Duration of HIV infection	178.26 (52; 278)	172.11 (52; 255)	185.68 (52; 278)	.60§
CD4 cell count	554 (153; 1197)	590 (290; 760)	539 (180; 1197)	1†
Log10 VL	2.10 (1.60; 4.72)	2.22 (1.60; 4.50)	2.23 (1.60; 4.72)	.98§
NRTI cumulative exp, months (range)	187.97 (8; 614)	182.55 (22; 317)	196.87 (22; 614)	.78§
NNRTI cumulative exp, months (range)	47.18 (1; 131)	35 (12; 82)	32.81 (1; 111)	.85§
PI cumulative exp, months (range)	68.73 (1; 593)	59.44 (21; 120)	81.82 (1; 593)	.59§
AST/ALT	1.00 (0.51; 2.1)	.86 (0.51; 1.45)	.94 (0.51; 1.54)	.55§
Waist	86.54 (69; 113)	90.11 (78; 113)	89.58 (77; 113)	.90§

*2-sample test of proportion; § 2-sample unpaired t-test; † Wilcoxon signed-rank test.

Table 2:

	US+ CT+	US- CT-	US+ CT-	US- CT+	Agreement	Kappa	C.I. 95%
All Patients n = 70	11	33	22	4	62.86%	.23	.03; .43
HCV- n = 46	7	21	16	2	60.87%	.22	-.01; .45

Summary of Results

46 patients were included. NAFLD prevalence with US was 19.57% and with CT 50.00%. (Tables 1 and 2).

K of Cohen coefficent between L/S ≤1.1 and US score ≥2 was 0.21 (agreement = 60.87%), US score ≥3 was 0.45 (agreement = 80.43%), US score ≥4 was 0.29 (agreement = 80.43%).

Conclusion

Non-invasive imaging agreement between US and CT to diagnose NAFLD is less than ideal. Best concordance is found for US ≥3 and L/S ≤1.1. Liver biopsy studies are needed to validate cut-off of US evaluation and L/S in people living with HIV.