The Enhanced Liver Fibrosis (ELF) test compared to transient elastography in haemophilia patients with chronic hepatitis C

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Introduction

Progressive liver damage due to hepatitis C virus infection is a major cause of co-morbidity among haemophilia patients. Liver biopsies are the golden standard for determination of fibrosis. However, the most used test to measure the fibrosis stage is now transient elastography (TE). New biochemical markers for detection of fibrosis are upcoming. Among them is the enhanced liver fibrosis (ELF) test, combining levels of hyaluronic acid, procollagen-III-amino terminal peptide and tissue inhibitor of metalloproteinase-1. Since liver biopsies are not desirable in haemophilia patients, the ELF test was compared with TE.

Methods and patient characteristics

Figure 1. Patient selection

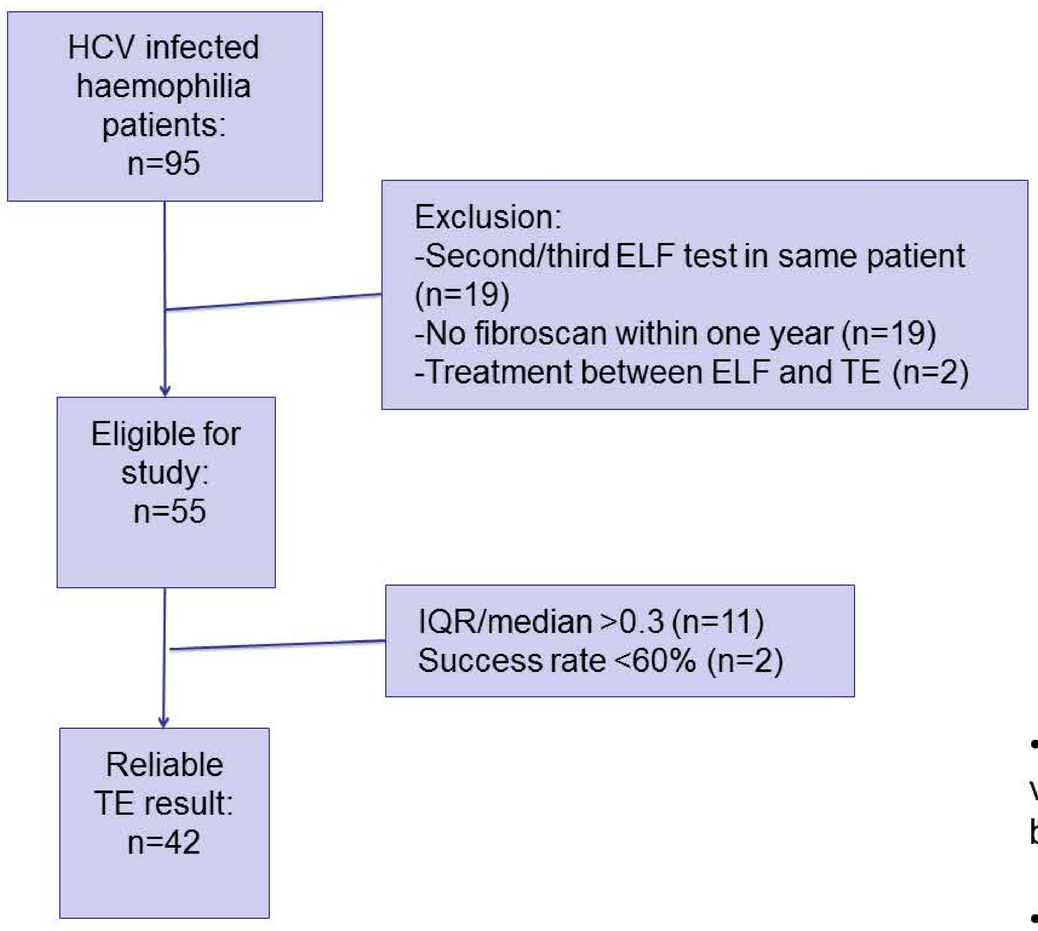


Table 1. Patient characteristics

Age (years)	49	(41-57)
HIV coinfection	6	(10.9%)
HCV genotype		
1	47	(85.4%)
2	2	(3.6%)
3	3	(5.5%)
4	3	(5.5%)
Haemophilia A	50	(90.9%)
Duration of infection (years)	42	(37- 47)
Age at time of infection (years)	6	(1-16)
AST (U/L)	51.0	(38-90)
ALT (U/L)	38.0	(29 -55.3)
Time between ELF and TE (days)	14	(0-116)
Unsuccessfully treated for HCV	22	(40.0%)

Values are medians (IQR) or numbers (proportion)

Results

Table 2. Correlation between TE and ELF, FIB-4, APRI scores

	Concordance with TE	Spearman rank correlation
ELF	45.3%	0.429 (p = 0.005)
FIB-4	73.3%	0.613 (p = 0.000)
APRI	63.2%	0.644 (p = 0.000)

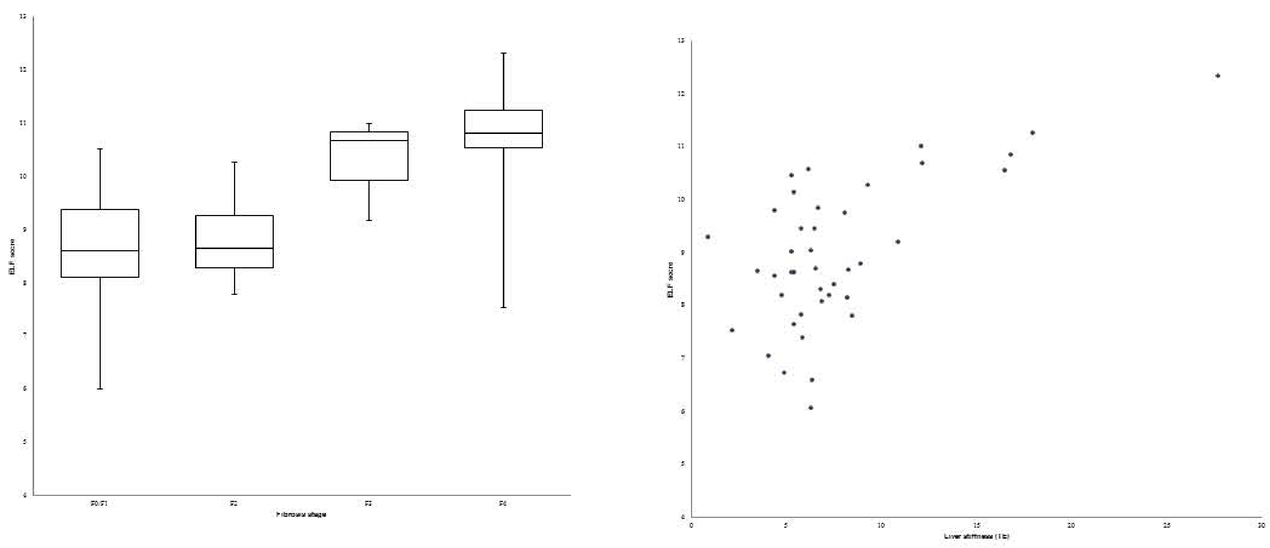
Figure 2. Correlation between liver stiffness measured with TE and ELF score

Table 3. TE outcome and median liver stiffness and ELF scores

Fibrosis stage (TE)	Number of patients (%)	liver stiffness (kPa)	ELF score
F0/F1	26 (47.3)	5.4 (4.9-6.3)	8.6 (7.8-9.4)
F2	8 (14.5)	8.3 (7.7-8.8)	8.5 (8.1-9.5)
F3	3 (5.5)	12.1 (10.9-12.1)	10.7 (9.2-10.7)
F4	5 (9.1)	16.8 (9.4-22.9)	10.8 (9.0-11.8)
Unreliable TE result	13 (23.6)		9.0 (8.3-10.3)

Figure 3. Boxplot of ELF scores (median with IQR) for different stages of fibrosis measured with TE

Values are medians (IQR)



• ELF score differences between the four levels of liver fibrosis were significant (p-value of Kruskal-Wallis test = 0.023). The increase in ELF-score was highest between stage F0-F2 and F3-F4 (p- value of Mann Whitney U test = 0.001).

•In multivariate analyses only AST level was significantly associated with ELF score (coefficient = 0.018 (0.008-0.029), p-value =0.001)

Conclusion

• There was a significant, but limited, correlation between the ELF score and liver stiffness measured with TE

• ELF-score may be a good discriminator between fibrosis stage F0-F2 and stage F3-F4

• FIB-4 and APRI showed better agreement with TE than the ELF-test