

# HOW CAN WE OBTAIN FIBROSIS OUT OF LIVER STIFFNESS AND BIOCHEMICAL TESTS?

G. S. Gherlan, P. I. Calistru, C. Voinea, C. Szabo

Center for Diagnostics and Treatment "Dr. Victor Babes", Bucharest, Romania

**Background:** Liver stiffness measurement (by transient elastography (Fibroscan®)) is one of the newest and most verified noninvasive imaging based methods for the assessment of liver fibrosis.

Fibrotest® is a marketed biochemical score for the evaluation of fibrosis and inflammatory grade with also a lot of well documented studies behind.

We aimed to verify how these two tests are correlated with liver biopsy and with each other.

**Methods and Patients:** We analyzed retrospectively 230 patients for which we had available liver biopsy (LB), Fibroscan (FS) and Fibrotest (FT) and complete blood count (CBC) performed in an interval of maximum one week. The patients were suffering either of B hepatitis or of C hepatitis.

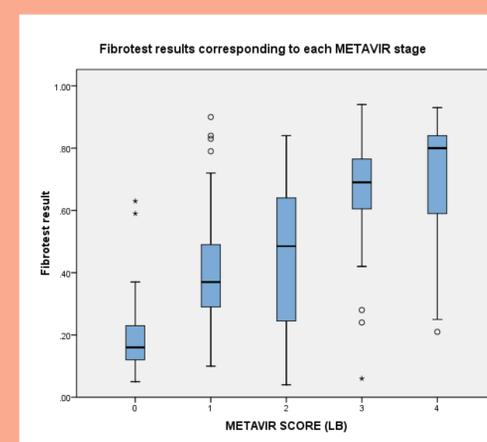
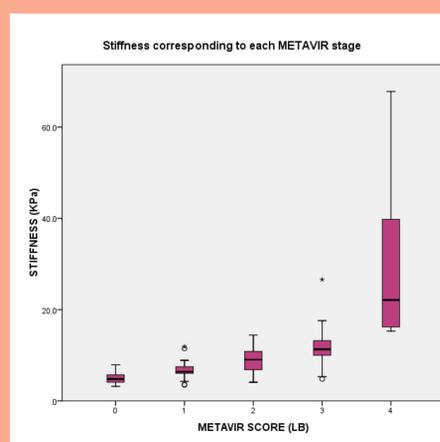
## Results:

### Characteristics of the patients

Number of patients: 230  
Male: 136 (59.13%)  
Age at biopsy: 46.64 (+/- 11.6) years  
Hepatitis C/Hepatitis B 130/100

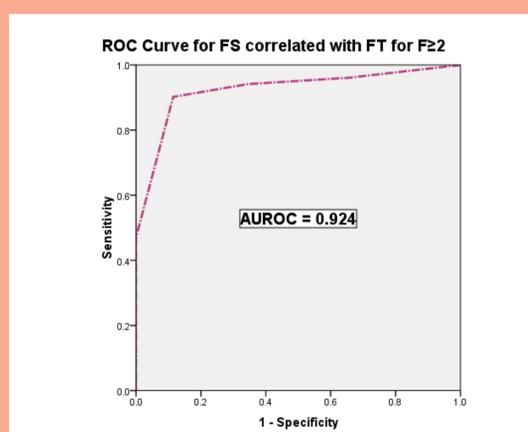
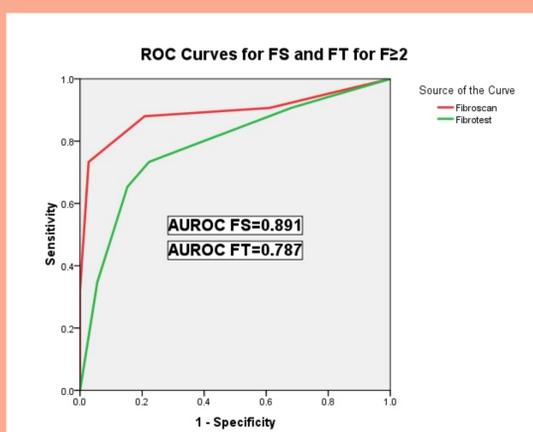
### Fibrosis stage (LB - METAVIR score)

F0 46  
F1 67  
F2 38  
F3 48  
F4 31



Best correlation was found between FS and biopsy ( $r=0.854$ ,  $p<0.001$ ). FT and LB were also well correlated ( $r=0.715$ ,  $p<0.001$ ), while FS and FT were poorer correlated ( $r=0.449$ ,  $p<0.001$ ).

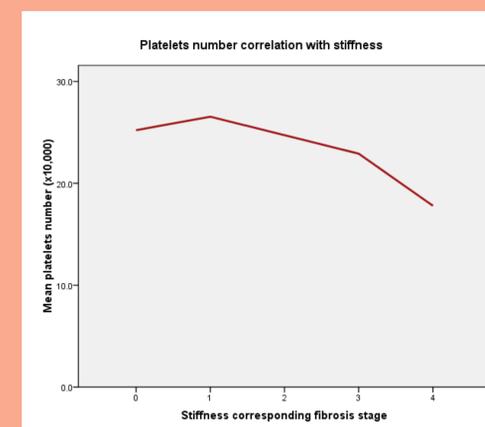
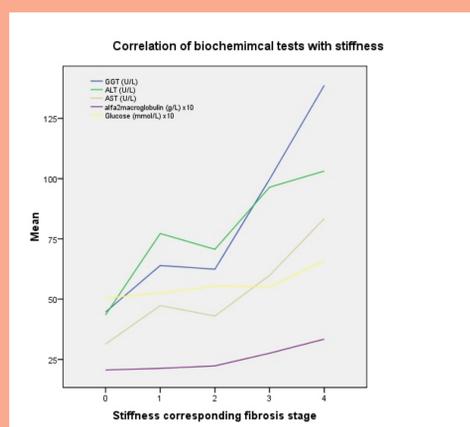
Taken by etiology, the correlations maintain, but are stronger in C hepatitis: LB and FS ( $r=0.854$  versus  $r=0.843$ ,  $p<0.001$  and  $p<0.001$  for C respectively B hepatitis); LB and FT ( $r=0.776$  versus  $r=0.551$ ,  $p<0.001$  both); FS and FT ( $r=0.516$  versus  $r=0.278$ ,  $p<0.001$  versus  $p<0.005$  for C respectively B hepatitis).



The AUROC of FS for predicting  $F \geq 2$  was 0.891. For FT predicting  $F \geq 2$ , The AUROC was 0.787. When combined, FS and FT have an AUROC of 0.924 in predicting significant ( $>2$ ) fibrosis. 163 of 230 patients had FS concordant with FT, and having The AUROC of 0.924, this means that in these patients (70.86%), liver biopsy could be avoided. On the other hand, this means that in almost 30% of the patients, noninvasive tests are discordant, and thus inconclusive.

Liver stiffness was significantly correlated with the results of alpha 2 macroglobulin, GGT, ALT, AST, serum glucose level, and inversely correlated with haptoglobin, cholesterol and platelet count ( $r =$  respectively 0.375, 0.415, 0.255, 0.383, 0.281, -0.204, -0.247, -0.305, all with statistic significance, with  $p$  lower than 0.002).

When we looked closer, these correlations were maintained only in the group in which FS and FT were correlated, suggesting that this fact could be used as a quantification factor for the correctness of FS.



**Conclusions:** Both noninvasive methods performed well in predicting separately the fibrosis.

Used together they have an even higher sensibility and specificity when it comes to identify significant fibrosis.

The correlation of biochemical tests with FS only in the group in which FS is correlated with FT could be used as a supplementary test in order to improve the elastography's performance.