The diagnostic efficacy of APRI score, Forn's index, Goteborg University Cirrhosis Index (GUCI) and serum matrix metalloproteinase-1 (MMP-1) versus Fibroscan as non invasive markers of liver fibrosis in patients with chronic viral hepatitis

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List of Abbreviations

1	**ECM**	***Extracellular Matrix***
2	**HSC**	***Hepatic stellate cell***
3	**MMP-1**	***Matrix metalloproteinase-1***
4	**TIMPs**	***Tissue inhibitors of metalloproteinases***
5	**TGF-b**	***Transforming Growth Factor Beta***
6	**PDGF**	***Platelet derived growth factor***
7	**CTGF**	***Connective tissue growth factor***
8	**KCs**	***Kupffer cells***
9	**LPs**	***Lipopolysaccarides***
10	**TNF**	***Tumor necrosis factor***
11	**NK**	***Natural Killer cells***
12	**PPAR**	***Peroxisome Proliferator activated receptor***
13	**NASH**	***Non alcoholic steatohepatitis***
14	**tTG**	***Tissue transglutaminase***
15	**MFB**	***Myofibroblast***
16	**MSCs**	***Mesenchymal stem cells***
17	**HGF**	***Hepatocyte growth factor***
18	**HA**	***Hyaloronic acid***
19	**PIIINP**	***Procollagen III amino-terminal peptide***
20	**GGT**	***Gamma glutamyl transferase***
21	**FT**	***Fibrotest***
22	**ELFG**	***European liver fibrosis groug***
23	**MRI**	***Magnetic resonance imaging***
24	**CT**	***Computed tomography***
25	**LV**	***Liver volume***
26	**ROC**	***Receiver operating characteristic***
27	**kPa**	***Kilopascal***
28	**AUR**	***Area under the curve***
29	**ULN**	***Upper limit of the normal range***
30	**BMI**	***Body mass index***

The diagnostic efficacy of APRI score, Forn's index, Goteborg University Cirrhosis Index (GUCI) and serum matrix metalloproteinase-1 (MMP-1) versus Fibroscan as non invasive markers of liver fibrosis in patients with chronic viral hepatitis

Introduction:

Chronic liver diseases are very common worldwide, particularly those linked to viral hepatitis. Their natural history is variable and long term evolution differs in individual patients. Optimized clinical management of compensated chronic liver diseases requires precise of the stage of fibrosis, the main determinant of prognosis and of most therapeutic decisions ***(Sebastiani and Alberti, 2006).***

The assessment of liver fibrosis provides useful information not only for diagnosis but also for therapeutic decision. Although needle biopsy of the liver is the gold standard for fibrosis assessment, it has some technical limitations and risk. This has led to the development of non invasive biochemical markers of liver fibrosis ***(Grigorescu, 2006).***

Many non invasive markers of liver fibrosis have been recently proposed and assessed as substitutes of liver biopsy. Direct markers are based on biochemical parameters directly linked to fibrogenesis while indirect markers use simple or more sophisticated parameters that correlate with liver fibrosis stages.

Non invasive markers of liver fibrosis have been tested in different forms of chronic liver disease and showed variable diagnostic performance. Better results were obtained when markers were combined. An ideal non invasive diagnostic marker for hepatic fibrosis should be simple, inexpensive and accurate ***(Sim et al., 2005).***

The aspartate aminotransferase to platelet index (APRI) uses routine laboratory data to predict significant fibrosis and cirrhosis in patients who have chronic HCV infection and can exclude patients with and without significant fibrosis and cirrhosis ***(Wai et al., 2003)***

The forn's index is based on platelet count, age, cholesterol level and gamma glutamyl transferase ***(Forns et al., 2002).*** This test is good at predicting only those patients who have minimal fibrosis ***(Thabut et al.,2003)***

A simple index, the Goteborg University Cirrhosis Index (GUCI), consisting of the standard biochemical serum markers; AST, prothrombin, INR and platelet count can exclude cirrhosis in untreated patients with a high degree of accuracy ***(Islam et al., 2005)***

Regulatory factors involved in the mechanism of liver fibrosis such as PDGF-BB, TGF-β1, interstitial enzyme, matrix metalloproteinase-1 (MMP-1) and its inhibitor (TIMP-1) have been studied extensively. To find out whether these factors or enzymes could be used as the indices for diagnosis of liver fibrosis. At the

same time, these markers were compared with liver biopsy results to identify their values in clinical practice ***(Zhang et al., 2003).***

Advantages of Fibroscan are its excellent reproducibility and low inter-observer variability. Fibroscan also evaluates a greater volume of liver than is evaluated by liver biopsy; especially, Fibroscan measures liver stiffness of a volume of liver 100 times greater in size than liver biopsy and therefore is more representative of the entire hepatic parenchyma ***(Ziol et al., 2005)***

Aim of the work:

The aim of this work is to evaluate the diagnostic efficacy of APRI score, Forn's index, Goteborg University Cirrhosis Index (GUCI) and serum matrix metalloproteinase-1 (MMP-1) in determining the stage of liver fibrosis in patients with chronic viral hepatitis and to compare their results with those of Fibroscan.

Patients and methods:

This study will be carried out on 40 patients with chronic viral hepatitis proved by liver biopsy collected from Internal Medicine Department, Ain Shams University Hospital.

All participants in the study will be subjected to:

1. Full history taking and full clinical examination.

2. Routine laboratory investigations: complete blood count, erythrocyte sedimentation rate, serum creatinine, serum aspartate aminotransferase (AST), serum alanine aminotransferase (ALT), total and direct bilirubin, alkaline phosphatase, fasting blood sugar, serum total proteins, serum albumin, serum cholesterol, prothrombin time, INR, gamma glutamyl transferase and serum matrix metalloproteinase-1 (MMP-1).

3. Abdominal ultrasonography.

4. Calculation of APRI score ; AST / platelet count .

5. Calculation of Forn's index ; 7.811 – 3.131 X (Platelet count) +0.781 X (GGT) + 3.467 X (age) – 0.014 X (cholesterol).

6. Calculation of Goteborg University Cirrhosis Index (GUCI) ; normalized AST X prothrombin – INR X 100 / platelet count (x 10(9)/l).

7. Fibroscan for measurement of liver stiffness.

8. Liver biopsy with staging of liver fibrosis according to modified histological activity index (HAI).

9. Statistical analysis of the results.

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