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Research Article

Interest and Limits of Systematic Liver Fibrosis Screening in Psychiatric Hospital using Free Biologic Marker FIB4: 26 Months Period Results

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Summary

Introduction: Liver diseases are common in psychiatric hospitalized patients who combine risk factors: alcohol, overweight and metabolic syndrome, hepatitis C and/or B, hepatotoxic drugs. The FIB-4 index is a simple, free biomarker for advanced liver fibrosis. The calculation of the FIB-4 index requires knowledge of age, ALT and AST transaminases and platelet levels. Our psychiatric hospital (CHP) serves a population of nearly 500,000 and is a place of life but also a potential screening site. It has 382 beds, and the 2019/2020 annual active queue is 1434 and 878 hospitalized patients (average length of stay 29 days). A bi-monthly nursing staff at the General Hospital was set up in 2018 to carry out FIBROSCAN according to a validated task delegation protocol and a partnership established with the CHP biology laboratory for the follow-up of viral serologies B and C positive. A bimonthly consultation of hepatology on site completed the device. We found that screening for liver fibrosis with a simple biological test could be useful on a large scale for all hospitalized patients. After informing psychiatrists and general practitioners practicing at CHP, the automated calculation of the FIB-4 on all biologies including transaminases and platelets detected advanced liver fibrosis in hospitalized patients. The results of the first 1058 patients were presented at the 2021 AFEF congress.

Results: In 26 months, 2251 FIB4 measurements with an average value of 0.88 (extremes 0.09-10.23) and an average age of 57.2 years, 60% men, average BMI of 27.1; 268 patients had a value greater than 1.45 of which 129 (48%) had a FIBROSCAN: 87 patients (67%) classified F0F1, of which 7 with excessive alcohol consumption (OH), 1 diabetic, 16 steatosis, 1 hemochromatosis, 3 HCV and 60 rhabdomyolysis (average CPK 2081); 27 F2 patients (21%) of which 4 OH, 5 diabetics, 4 steatosis, 1 hemochromatosis and 13 rhabdomyolysis (average CPK 1185) 6 F3 patients including 4 OH, 4 diabetic and 1 steatosis; 9 F4 patients including 7 OH, 3 diabetic, 5 steatoses, 1 HBV and 5 HCV. None of the F3 or F4 patients had rhabdomyolysis. All patients with rhabdomyolysis had multiple intramuscular injections in the previous 3 days; 105 patients with hepatic steatosis had one measurement per CAP probe: 60 patients < 240dB/m, 19 between 240 and 280dB/m and 26 > 280 dB/m. all patients with fibrosis estimated to be greater than or equal to F3 or severe steatosis were seen in specialist consultation.

Conclusion: Moderate or severe hepatic fibrosis is common among hospitalized psychiatric patients. Systematic biological screening by FIB4 is useful for individualizing patients subject to a secondary orientation towards the realization of a FIBROSCAN. Rhabdomyolysis is a major factor in non-hepatic FIB4 augmentation, especially in patients without hepatic fibrosis.

Keywords: Liver fibrosis, Screening, FIB4, Rhabdomyolysis

Introduction

FIB-4 (Fibrosis-4 index) is a biomarker of the risk of severe hepatic fibrosis (i.e., F3 or F4 fibrosis). The FIB-4 is based on a simple, free algorithm, available on the internet, which is calculated thanks to the patient's age, platelet rate and transaminases. The frequency of conducting biological tests on the same day (transaminases and

platelets) and the free use of the algorithm make it a useful and easy screening tool in the general population. FIB-4 is a simple and free biomarker for diagnosing advanced liver fibrosis. The calculation of the FIB-4 index requires knowledge of age, ALT and AST transaminases and platelet rate. It is simple and free to diagnose advanced liver fibrosis, using the following thresholds [1]:

a) FIB-4 < 1.30 excludes clinically significant hepatic fibrosis.

b) >1.3 and < 2.67 (<65years) intermediate risk.

c) >2 and <2.67 (>65years) intermediate risk.

d) FIB-4 > 1.45/1.3 indicates additional explorations, for example impulse elastometry (FIBROSCAN).

e) 2.67 high risk of significant fibrosis.

f) >3.25 advanced hepatic fibrosis and requires full hepatological assessment.

Actually, FIB4 can correctly identify patients with severe fibrosis (F3-F4). FIB4 1.45 has a negative predictive value of 93.7%. FIB4 > 4 has a positive predictive value of 66%

Why Screen for Hepatic Fibrosis in a Psychiatric Hospital?

We have many data in FIB4 screening in general population but not in psychiatric patients. However, liver diseases are common in psychiatric patients who combine risk factors: alcohol, overweight and metabolic syndrome, hepatitis C and/ or B, hepatotoxic drugs [2-6].

Current Use of the FIB4

In the case of metabolic liver diseases, the most common situation in psychiatric settings, the French Association for the Study of the Liver made the following recommendations in 2020 [1]:

a) Hepatic fibrosis should be assessed in all patients with one or more metabolic risk factors, particularly in patients with type 2 diabetes (B1).

b) Assessment of hepatic fibrosis should use a single blood marker (FIB-4, NAFLD Fibrosis Score, eLIFT, Forns Score) as the first line (B2).

c) The NAFLD Fibrosis Score should not be used in the specific situation of screening for hepatic fibrosis in the diabetic population (B1).

d) A specialized blood marker (Fibrometer®, Fibrotest®, ELF®) or liver elasticity measurement should be performed as a second line if the simple blood marker suggests the presence of advanced chronic hepatopathy (B1).

e) A specialized consultation should be requested if the specialized eel marker or liver elasticity measurement confirms a possible advanced chronic liver disease (B1).

The psychiatric hospital (CHP) of Thuir serves a basin of nearly 500,000 inhabitants in the department of Pyrénées-Orientales. It is sometimes a place of life but also a potential place of screening. It has 382beds and the 2022 annual active queue is 1434 hospitalized patients (average length of stay 29days). A bimonthly nursing permanence of the Mobile Hepatitis Team of the Hospital Center (general) de Perpignan was set up in 2018 to carry out FIBROSCAN according to a validated protocol of task delegation and a partnership established with the biology laboratory of the CHP for the monitoring of viral serologies B or C positive. A bimonthly hepatology consultation on site completed the device. It appeared to us after internal discussion that screening for hepatic fibrosis could be useful on a large scale. We have described our actions in drugs users and psychiatric patients in previous articles and detailed in Table 1 for HCV patient linkage to care (Table 1) [7,8].

Table 1: HCV Patients linkage to care.

	2017	2018	2019	2020
Number of Patients	1474	1479	1434	878
Prescribed Serology	1008	1205	1347	1064
Realized Serology	879	1022	1028	1064
Screening Rates	**59.6**	**69.1**	**71.7**	**100**
HCV Positive Patients	30 (3,41%)	26 (2,54%)	29 (2,82%)	52 (4,89%)
New Patients	**8 (0,91%)**	**9 (0,88%)**	**14 (1,36%)**	**14 (1,36%)**
Prescribed HCV Viral Load	37	22	23	16
Realized HCV Viral Load	29 (78,3%)	21 (95,4%)	25 (100%)	24 (100%)
Patients Seen in Consultation	**12**	**9**	**14**	**8**
Negative HCV Viral Load	9	8	5	4
Positive HCV Viral Load	**3**	**1**	**7**	**4**
Fibroscan F0-F1-F2	12	8	11	7
Fibroscan F3-F4	0	1	1	1
Started Treatment	**3 (100%)**	**1 (100%)**	**5 (71%)**	**4 (100%)**
Complete SVR	3	1	4	3
Waiting SVR	0	0	1	1/

Patients and Methods

An (almost) systematic biological assessment is carried out at the CHP including the biological parameters necessary for the calculation of FIB-4. After informing psychiatrists and general practitioners of the CHP, it was established on October 1, 2020, the automated calculation of the FIB-index4 on all biologics including the determination of transaminases and blood platelets to detect advanced liver fibrosis in hospitalized patients. There was no need for any changes in prescriptions or additional examinations. We chose the threshold of 1.45 validated in the literature as pathological threshold. Patients with FIB-4>1.45 were referred for a FIBROSCAN performed by a nurse from the general hospital, as part of a validated protocol of interprofessional cooperation. If an equivalent F3F4 fibrosis was detected in FIBROSCAN, they were referred to hepatology consultation on site (Figure 1).

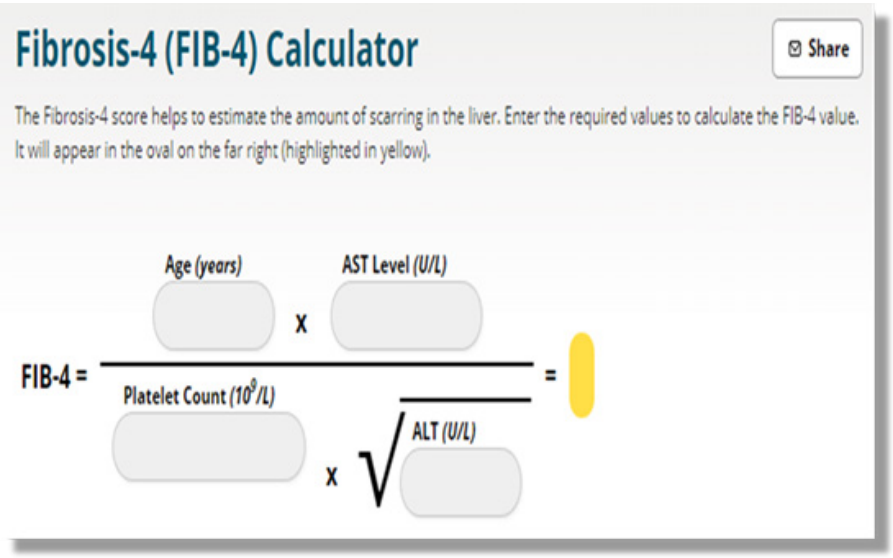

Figure 1: FIB4 calculator.

Results

In 26 months, 2251 FIB4 measurements were performed in hospitalized patients with an average value of 0.88 (extreme 0.09-10.23) and an average age of 57.2 years, 60% of men, average BMI of 27.1. In 268 patients (11.9%) had a value greater than 1.45 of which 129 (48%) had a FIBROSCAN. The other people got out of hospital too fast to have this exam (Tables 2,3).

Table 2: General Results.

	Number of Patients	Mean Age	Sex	Mean FIB4	Mean ALAT	Mean ASAT	Mean CPK	Mean CAP Value	Mean Liver Fibrosis	Alcoholic	Diabetes	Steatosis	HBV	HCV	Iron Excess	Dyslipidemia	Nutritional Supplement
F0F1	99	54.5	56 men	2.23	98	99	1828	231	4.27	7	2	16	0	3		6	1
F2	28	61	16 men	2.07	38	52	1185	246	6.88	4	5	4	0	0	1	1	1
F3	7	57	4 men	3.648	32	54	50	208	10.18	4	5	1	0	0		1	
F4	9	57	7 men	2.9575	57	73	93	320	30.37	7	3	5	1	4			
CAP>280	31	57	19 men	2.03	56	52	139	325	6.9	5	4	21	1	1		3	1
70ans	26	75.5	10 men	2.44	37	45	557	237	4.98								

Table 3: CPK values.

CPK Measure	Not Done	Normal	High Level
F0-F1	52	16	22
F2	18	5	5

F3	0	7	0
F4	6	3	0

Eighty-seven 87 patients (67%) were classified F0F1, including 7 with excessive alcohol consumption (OH), 1 diabetic, 16 steatosis, 1 hemochromatosis, 3 carriers of hepatitis C (HCV) and 60 with rhabdomyolysis (average CPK 2081); 27 patients were classified F2 (21%) including 4 OH, 5 diabetics, 4 steatosis, 1 hemochromatosis and 13 with rhabdomyolysis (mean CPK 1185); 6 patients were classified F3 including 4 OH, 4 diabetics and 1 steatosis; 9 patients were classified F4, that is to say at the stage of cirrhosis including 7 OH, 3 diabetics, 5 steatosis, 1 HBV and 5 HCV. None of the F3 or F4 patients had rhabdomyolysis. All patients with rhabdomyolysis had multiple intramuscular injections in the previous 3 days. In addition, 105 patients with fatty liver had a CAP probe measurement: 60 patients had a value <240dB/m, 19 between 240 and 280dB/m and 26>280dB/m. All patients with fibrosis estimated to be greater than or equal to F3 or severe steatosis were seen in specialized consultation at the psychiatric hospital site.

Discussion

There are no major studies on the use of FIB4 as a method of systematic screening for hepatic fibrosis in psychiatric hospitals in France. In our study, severe hepatic fibrosis is more common in psychiatric patients than in the general population. The prevalence of patients with significant fibrosis (greater than F2) after FIBROSCAN was 1.9%, severe fibrosis F3F4 0.7%. In a general population study in the Alpes Maritimes (2), the prevalence of a high FIB4 was 1.7%. and that of a significant fibrosis on FIBROSCAN of 13 out of 62 patients (21%). In a study conducted by Bordeaux University Hospital, the prevalence of pathological FIB4 was 7.3%; 45% of these patients had FIBROSCAN, with significant fibrosis in 40% of patients. Consideration of the confounding factor rhabdomyolysis by increasing transaminases for a non-hepatic cause is not reported in the literature.

Conclusions

Biological screening for hepatic fibrosis in psychiatric hospitals is feasible and useful for individualizing patients with moderate or severe fibrosis. The FIB4 allows to select patients to have a FIBROSCAN. The place of the CAP probe remains to be specified in this population at high risk of NASH. Rhabdomyolysis induced by intramuscular injections is an overestimation factor that requires a second measure before affirming the existence of chronic hepatopathy. After FIBROSCAN realization, follow up of these patients will be done according to the EASL/AASLD and BAVENO recommendations [9-11].

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None.

Conflict of Interest

None.

References

1. Boursier J, De Ledinghen V, Leroy V, Anty R, Francque S, et al. (2017) A stepwise algo- rithm using an at-a-glance first-line test for the non-invasive diagnosis of advanced liver fibrosis and cirrhosis. J Hepatol 66(6): 1158-1165.
2. Ouzan D, Mosnier, A, Penaranda G, Daviaud I, Joly H, et al. (2021) Prospective screening for significant liver fibrosisby fibrosis-4 in primary care patients without known liver disease. Eur J Gastroenterol Hepatol 33(1S): e986-e991.
3. Ginès P, Graupera I, Lammert F, Paolo Angeli, Llorenç Caballeria, et al. (2016) Screening for liver fibrosis in the general population: a call for action. Lancet Gastroenterol Hepato 1(3): 256-260.
4. Ginès P, Castera L, Lammert F, Miquel Serra Burriel, Alina M Allen, et al. (2022) Population screening for liver fibrosis: Toward early diagnosis and intervention for chronic liver diseases. Hepatology 75(1): 219-228.
5. Graupera I, Thiele M, Serra Burriel M, Llorenç Caballeria, Dominique Roulot, et al. (2022) Low Accuracy of FIB-4 and NAFLD Fibrosis Scores for Screening for Liver Fibrosis in the Population. Clin Gastroenterol Hepatol 20(11): 2567-2576.
6. https://afef.asso.fr/wp-content/uploads/2020/07/DNI-VERSION-FINALE-RECO-2020.pdf.
7. Remy AJ, Bouchkira H, Hervet J, Happiette A, Wenger H (2019) Mobile Hepatitis Team: a new pathway of HCV outreach care, since screening to treatment. Gut and Gastroenterology 2: 1-6.
8. Remy AJ, Bouquie R, Hervet J (2021) Management of Hepatitis C in Psychiatric Settings: Review of The Literature and Review of Experiences Over 4 Years in A Psychiatric Hospital. Gastroint Hepatol Dig Dis 4(1): 1-4.
9. European Association for the Study of the Liver. Clinical Practice Guideline Panel; Chair: EASL Governing Board representative: Panel members (2021) EASL Clinical Practice Guidelines on non-invasive tests for evaluation of liver disease severity and prognosis - 2021 update. J Hepatol 75(3): 659-689.
10. Rinella ME, Neuschwander Tetri BA, Siddiqui MS, Manal F Abdelmalek, Stephen Caldwell, et al. (2023) AASLD Practice Guidance on the clinical assessment and management of nonalcoholic fatty liver disease. Hepatology 77(5): 1797-1835.
11. De Franchis R, Bosch J, Garcia Tsao G, Reiberger T, Ripoll C, et al. (2022) Baveno VII-Renewing consensus in portal hypertension. J Hepatol 76(4): 959-974.