SAS Journal of Medicine
Abbreviated Key Title: SAS J Med
ISSN 2454-5112
Journal homepage: https://saspublishers.com

OPEN ACCESS

Gastroenterology

Primary Biliary Cholangitis: Assessment of Fibrosis by Fibroscan® and Prognostic GLOBE and UK PBC Scores: Experience of a University Center

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DOI: https://doi.org/10.36347/sasjm.2026.v12i03.011 | **Received:** 05.02.2026 | **Accepted:** 18.03.2026 | **Published:** 24.03.2026

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Abstract **Original Research Article**

Background: Primary biliary cholangitis (PBC) is a chronic autoimmune cholangiopathy whose course is driven by the degree of fibrosis and the response to ursodeoxycholic acid (UDCA) therapy. Liver elastography by FibroScan and specific prognostic scores (GLOBE, UK-PBC) are key tools for risk stratification. ***Patients and methods:*** We conducted a retrospective descriptive and analytical study including 40 patients with PBC followed in the EFD-HGE department of Ibn Sina University Hospital in Rabat between April 2010 and March 2026. Most patients received UDCA therapy and underwent at least one liver stiffness measurement using FibroScan. Clinical, biochemical, imaging, histological, and elastographic data were collected. Biochemical response at 12 months was assessed according to Paris II criteria, and GLOBE and UK-PBC scores were calculated in patients with sufficient follow-up. ***Results:*** The mean age at diagnosis was 55 years (range 24–86), with a marked female predominance (87.5 percent). Among the 25 patients assessed by FibroScan, the distribution of fibrosis stages was: F0–F1 40 percent, F2 8 percent, F3 4 percent, and F4 48 percent, corresponding to 12 patients with cirrhosis. A liver biopsy was performed in 26 patients (65 percent) and showed Ludwig stage IV (cirrhosis) in 6 cases (23.07 percent). Biochemical response to UDCA at 12 months, evaluated in 24 patients, was complete in 45.8 percent, partial in 33.3 percent, and absent in 20.8 percent. GLOBE and UK-PBC scores demonstrated a clearly better transplant-free survival in good responders compared with non-responders, with a particularly high cumulative risk of death or liver transplantation in the latter group. ***Conclusion:*** In this Moroccan PBC cohort, a substantial proportion of patients were managed at an advanced stage of fibrosis. Combining liver elastography by FibroScan, early assessment of UDCA response, and GLOBE/UK-PBC scores allows refined prognostic stratification and may help optimize follow-up and consideration of second-line therapies in high-risk patients.

Keywords: Primary biliary cholangitis, FibroScan, Liver fibrosis, Ursodeoxycholic acid, GLOBE score, UK-PBC score.

INTRODUCTION

Primary biliary cholangitis (PBC) is a chronic autoimmune cholangiopathy characterized by progressive destruction of small intrahepatic bile ducts, leading to prolonged cholestasis that may progress to fibrosis, cirrhosis, and their complications. The diagnosis is based on the combination of biochemical cholestasis, the presence of antimitochondrial antibodies or specific autoantibodies, and, in doubtful cases, compatible liver histology.

Ursodeoxycholic acid (UDCA) is the first-line treatment for PBC. In a substantial proportion of patients, it improves the biochemical profile, slows disease progression, and prolongs transplant-free survival. However, a non-negligible proportion of patients have an incomplete or absent response, exposing them to an increased risk of fibrosis progression and decompensation

Assessment of liver fibrosis therefore plays a central role in the management of PBC. Liver elastography, in particular liver stiffness measurement by FibroScan, has become a major non-invasive tool for

estimating fibrosis in chronic liver diseases, including PBC. In parallel, specific prognostic scores such as GLOBE and UK-PBC have been developed to refine the prediction of transplant-free survival using simple parameters and the response to UDCA.

The aim of this study was to describe the clinical, biochemical, imaging, elastographic, and prognostic characteristics of patients with PBC followed at Ibn Sina University Hospital in Rabat, with a particular focus on the assessment of fibrosis by FibroScan, the response to UDCA, and risk stratification using the GLOBE and UK-PBC scores.

PATIENTS AND METHODS

We conducted a retrospective, descriptive, and analytical study in the Department of Digestive Functional Explorations and Hepato-Gastroenterology (EFD-HGE) at Ibn Sina University Hospital in Rabat. The study period extended from April 2010 to March 2026.

All patients aged 18 years or older followed for PBC were included, with the diagnosis based on clinical features, biological criteria (chronic cholestasis, autoantibodies) and/or histology, in accordance with international guidelines. Patients with an overlap syndrome of PBC and autoimmune hepatitis were also included.

Exclusion criteria were the presence of another significant associated chronic liver disease (active hepatitis B or C, severe alcoholic liver disease, documented advanced NASH), incomplete medical records that did not allow analysis of treatment response or changes in liver stiffness, and unreliable elastography measurements according to usual quality criteria (success rate < 60 percent, IQR/LSM > 30 percent).

Data were extracted from medical records, FibroScan reports, endoscopy registers, and pathology reports.

Liver elastography was performed using a FibroScan Compact 530 device, with M or XL probes depending on the patient's body habitus and in accordance with recommended quality criteria (at least 10 valid measurements, success rate ≥ 60 percent, IQR/LSM ≤ 30 percent). Fibrosis was staged from F0 to F4 according to stiffness thresholds adapted to PBC, with F4 considered as cirrhosis.

Liver biopsy was performed in 26 patients, and fibrosis was staged according to the Ludwig classification (I to IV), with stage IV corresponding to established cirrhosis.

Most patients received UDCA at a dose of 13–15 mg/kg/day. Biochemical response at 12 months was assessed according to Paris II criteria, defining a good response as alkaline phosphatase ≤ 1.5 times the upper limit of normal, AST ≤ 1.5 times the upper limit of normal, and normal total bilirubin. Patients were classified as complete responders, partial responders, or non-responders based on these criteria.

GLOBE and UK-PBC scores were calculated in the 24 patients who had at least one year of treatment and complete data, in order to estimate transplant-free survival and the cumulative risk of death or liver transplantation at 5, 10, and 15 years.

RESULTS

A total of 40 patients with PBC were included over a 15-year period. The mean age at diagnosis was 55 years, with a range from 24 to 86 years. There was a marked female predominance, with 35 women (87.5 percent) and 5 men (12.5 percent), corresponding to a male-to-female ratio of 0.14.

Functional symptoms were present in 34 patients (85 percent), mainly pruritus (40 percent), asthenia (37.5 percent), and cholestatic jaundice (37.5 percent). On clinical examination, signs of portal hypertension were found in 6 patients (15 percent), and clinical ascites in 4 patients (10 percent).

Abdominal ultrasound was normal in 10 cases (25 percent) and showed a chronic liver disease pattern in 16 cases (40 percent), signs of portal hypertension in 12 cases (30 percent), and ultrasonographic ascites in 4 cases (10 percent).

Liver biopsy was performed in 26 patients (65 percent), with interpretable results in 23 cases. According to the Ludwig classification, 8 patients (34.7 percent) were at stage I, 5 (21.7 percent) at stage II, 4 (17.3 percent) at stage III, and 6 (26 percent) at stage IV (cirrhosis).

Among the 40 patients, 25 (62.5 percent) underwent liver stiffness measurement by FibroScan. The distribution of fibrosis stages was as follows: F0–F1 in 10 patients (40 percent), F2 in 2 patients (8 percent), F3 in 1 patient (4 percent), and F4 in 12 patients (48 percent), with stiffness values ranging from 14.8 to 30 kPa for stage F4.

Thus, 12 patients had cirrhosis on FibroScan, 6 of whom had histological confirmation of Ludwig stage IV, illustrating the overall concordance between elastography and liver biopsy in advanced stages.

Cirrhosis was diagnosed in 12 patients, some at the time of diagnosis and others during follow-up. Decompensation events included ascites in 4 patients (10 percent), hepatic encephalopathy in 1 patient (2.5

percent), and upper gastrointestinal bleeding in 1 patient (2.5 percent).

Child-Pugh and MELD scores were calculated in cirrhotic patients. Most were classified as Child-Pugh A, with MELD scores mainly between 10 and 14, indicating that cirrhosis was most often still compensated.

UDCA at a dose of 13–15 mg/kg/day was initiated as first-line therapy in 38 patients (95 percent), with excellent overall tolerance. Concomitant treatments were used according to clinical situations (bezafibrate, cholestyramine, corticosteroids, and azathioprine in cases of PBC–autoimmune hepatitis overlap).

GLOBE and UK-PBC scores were calculated in 24 patients with sufficient follow-up. For the GLOBE score, good responders had mean values around 0.30, with estimated transplant-free survival of 96 percent at 5 years, 90 percent at 10 years, and 82 percent at 15 years. In contrast, non-responders had mean values close to 1.06, with much lower survival probabilities (83.3 percent at 5 years, 61.2 percent at 10 years, and 41.5 percent at 15 years). Partial responders had an intermediate profile, with a mean score of 0.62.

The UK-PBC score confirmed these differences, with a median cumulative risk of death or liver transplantation estimated at 0.5 percent, 1.7 percent, and 3.1 percent at 5, 10, and 15 years in good responders, compared with 11.6 percent, 32.7 percent, and 50.3 percent in non-responders, and intermediate values in partial responders.

One patient underwent liver transplantation for decompensated cirrhosis with refractory ascites, with a favorable course after transplantation. Another patient was a candidate for transplantation for chronic hepatic encephalopathy but died.

DISCUSSION

This study, conducted in 40 patients with PBC followed in a Moroccan tertiary center, highlights a high proportion of advanced disease, with almost half of the patients assessed by FibroScan at stage F4 and a non-negligible number of cirrhosis-related complications.

From an epidemiological standpoint, our cohort confirms the classic profile of PBC, with a mean age at diagnosis around the fifth decade and a marked female predominance, in line with major international series. The high frequency of associated autoimmune diseases, particularly PBC–autoimmune hepatitis overlap, underlines the specific autoimmune background of these patients.

One of the main findings of this work is the high proportion of advanced fibrosis at the time of evaluation: 48 percent of patients explored by FibroScan were at stage F4, and 6 cirrhoses were histologically confirmed (Ludwig IV). This suggests a significant diagnostic delay, with many patients being managed at an already cirrhotic stage. The good overall concordance between F4 on FibroScan and Ludwig IV stage strengthens the value of elastography for identifying advanced stages.

Regarding response to UDCA, our rates of complete response (45.8 percent), partial response (33.3 percent), and non-response (20.8 percent) are within the ranges reported in the literature, where approximately 60–70 percent of patients achieve a satisfactory biochemical response, while 30–40 percent remain incomplete responders or non-responders. As in large cohorts, our results confirm the major prognostic impact of the 1-year response, as reflected by the GLOBE and UK-PBC scores.

Indeed, the GLOBE and UK-PBC scores reveal very contrasting transplant-free survival profiles between good responders, partial responders, and non-responders, with a particularly high cumulative risk of death or transplantation in the latter group. Their use in clinical practice makes it possible to move beyond a simple dichotomous "responder/non-responder" approach and to more finely tailor surveillance and consideration of second-line therapies in high-risk patients

However, our study has several limitations: its retrospective design, the relatively small sample size, the absence of inferential statistical analyses, and missing data for some parameters. In addition, FibroScan was not performed in all patients, which may introduce a selection bias toward more severe forms. Nevertheless, it provides original data on the profile of PBC in a Moroccan referral center and illustrates the relevance of combining liver elastography, assessment of UDCA response, and specific prognostic scores.

CONCLUSION

In this cohort of 40 patients with PBC followed at Ibn Sina University Hospital in Rabat, a substantial proportion of patients were managed at an advanced stage of fibrosis, with nearly half of those assessed by FibroScan at stage F4 and a non-negligible number of histologically confirmed cirrhoses. UDCA therapy allowed complete or partial biochemical response in the majority of patients, but a non-negligible fraction remained non-responders, with clearly poorer prognosis

Combining liver elastography by FibroScan, early evaluation of UDCA response, and GLOBE/UK-PBC scores appears to be a relevant approach to refine risk stratification, organize follow-up, and identify at an early-stage patients who require therapeutic intensification or consideration of liver transplantation.

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