

Comparative Changes in Fib-4 Score Before and After Taking Sofosbuvir and Daclatasvir in Hepatitis C Patients

Kainaat Ghalib^{1*}, Ali Hamza², Syed Babar Hussain¹, Nimra Ghalib¹, Jazib Ali³

¹Department of Medicine (Unit 1), Aziz Bhatti Shaheed Teaching Hospital, Gujrat, Pakistan

²Ehsan Medical Clinic and Maternity Home, Gujrat, Pakistan

³Nazir Medical Clinic Gujrat, Pakistan

*Corresponding author's email address: kainaatghalib.789@gmail.com

(Received, 14th January 2025, Accepted 25th February 2025, Published 28th February 2025)

Abstract: Chronic hepatitis C virus (HCV) infection remains a major cause of liver-related morbidity and mortality, particularly in high-burden countries such as Pakistan. The Fibrosis-4 (FIB-4) index is a simple non-invasive marker derived from age, aspartate aminotransferase, alanine aminotransferase, and platelet count, and is widely used for assessment of liver fibrosis. Although sofosbuvir and daclatasvir are established as effective direct-acting antiviral agents, local evidence regarding their effect on FIB-4 score remains limited. **Objective:** To compare FIB-4 scores before and after treatment with sofosbuvir and daclatasvir in patients with chronic hepatitis C. **Methods:** This comparative pre- and post-treatment study was conducted at Aziz Bhatti Shaheed Teaching Hospital, Pakistan, from July 2024 to December 2024. A total of 100 adult patients with serologically and/or molecularly confirmed chronic hepatitis C were enrolled through non-probability consecutive sampling. Patients received standard-dose sofosbuvir plus daclatasvir according to institutional protocol. Baseline and post-treatment laboratory parameters, including aspartate aminotransferase, alanine aminotransferase, platelet count, bilirubin, albumin, and hemoglobin, were recorded, and FIB-4 scores were calculated using the standard formula. Data were analyzed using SPSS version 26. Pre- and post-treatment comparisons were performed using paired sample t-test or Wilcoxon signed-rank test as appropriate. A p-value of ≤ 0.05 was considered statistically significant. **Results:** The mean age of participants was 44.8 ± 11.6 years, with 54.0% males and 46.0% females. The mean FIB-4 score decreased significantly from 2.98 ± 1.21 before treatment to 1.86 ± 0.88 after treatment ($p < 0.001$). Significant improvements were also observed in aspartate aminotransferase, alanine aminotransferase, platelet count, bilirubin, and albumin levels. The proportion of patients in the low-risk FIB-4 category increased from 39.0% before treatment to 68.0% after treatment, while the high-risk category decreased from 26.0% to 10.0%. End-of-treatment virological response was achieved in 92.0% of patients. Greater reductions in FIB-4 score were observed among younger, non-cirrhotic, and treatment-naïve patients. **Conclusion:** Sofosbuvir plus daclatasvir was associated with significant improvement in FIB-4 score and liver biochemical parameters in patients with chronic hepatitis C. The findings suggest that FIB-4 may serve as a practical and accessible tool for monitoring fibrosis-related improvement following antiviral therapy in routine clinical practice.

Keywords: Hepatitis C, Chronic; Sofosbuvir; Daclatasvir; Liver Cirrhosis; Biomarkers; Platelet Count

[How to Cite: Ghalib K, Hamza A, Hussain SB, Ghalib N, Ali J. Comparative changes in fib-4 score before and after taking sofosbuvir and daclatasvir in hepatitis C patients. *Biol. Clin. Sci. Res. J.*, 2025; 6(2): 227-231. doi: <https://doi.org/10.54112/bcsrj.v6i2.2254>

Introduction

Chronic hepatitis C virus (HCV) infection remains a major global health challenge, affecting approximately 58 million people worldwide, and contributing substantially to liver cirrhosis, hepatocellular carcinoma, and liver-related mortality (1). Despite the availability of highly effective direct-acting antiviral (DAA) therapies, progress toward the World Health Organization's 2030 elimination targets has been slow, with an estimated 78.6% of HCV infections remaining undiagnosed globally (2). Pakistan bears a disproportionately high burden of HCV, with an estimated seroprevalence of 6.2% in the general population, making it one of the most heavily affected countries in the world (3). Recent provincial-level modeling estimates that approximately 9.75 million Pakistanis are living with viraemic HCV infection, predominantly genotype 3, underscoring the urgent need for accessible and affordable treatment strategies (4). Assessment of hepatic fibrosis is critical for guiding treatment decisions and monitoring therapeutic outcomes in chronic HCV infection. The Fibrosis-4 (FIB-4) index, a simple non-invasive score calculated from age, aspartate aminotransferase (AST), alanine aminotransferase (ALT), and platelet count, has been validated as a reliable tool for staging liver fibrosis across multiple chronic liver diseases, (5). Recent studies have demonstrated that FIB-4 scores decline significantly following successful DAA therapy, suggesting that this index can serve as a practical marker for monitoring fibrosis regression in resource-limited settings (6).

The combination of sofosbuvir (SOF), a pangenotypic NS5B polymerase inhibitor, and daclatasvir (DCV), an NS5A inhibitor, has emerged as one of the most widely used DAA regimens worldwide, particularly in low- and middle-income countries where generic formulations are available (7). Studies from Pakistan have demonstrated the effectiveness of SOF+DCV in achieving high end-of-treatment and sustained virological response rates across various patient populations, including those with compensated and decompensated cirrhosis (8). Large-scale real-world data from Pakistan's National Hepatitis C Program have further confirmed SVR rates exceeding 94% with this regimen in genotype 3-infected patients (9).

While the virological efficacy of SOF+DCV is well established, data on its impact on non-invasive fibrosis markers, particularly the FIB-4 index, remain limited in the Pakistani context. Previous studies have shown that DAA-induced SVR is associated with histological and biochemical improvement in liver fibrosis (10); however, whether these improvements are reflected in FIB-4 score changes and the factors influencing such changes in the Pakistani population require further investigation. The present study aims to evaluate comparative changes in FIB-4 scores before and after SOF+DCV therapy in chronic HCV patients and to identify predictors of FIB-4 improvement, thereby contributing to the growing evidence base for optimizing HCV management in Pakistan.

Methodology

The study was conducted at Aziz Bhatti Shaheed Teaching Hospital in Pakistan from July 2024 to December 2024. A comparative pre- and post-treatment design was used to evaluate changes in FIB-4 score among patients with chronic hepatitis C receiving a combination of sofosbuvir and daclatasvir. A total sample size of 100 patients was included. Adult patients of either gender, aged 18 years and above, with serologically and/or molecularly confirmed chronic hepatitis C infection and planned treatment with sofosbuvir and daclatasvir according to institutional protocol were enrolled. Patients with co-infection with hepatitis B or HIV, hepatocellular carcinoma, decompensated chronic liver disease with severe systemic instability, chronic hematological disorders affecting platelet count, pregnancy, or incomplete baseline or follow-up investigations were excluded from the study.

Patients were selected using non-probability consecutive sampling from outpatient and inpatient hepatology and gastroenterology services during the study period. After informed consent, baseline demographic and clinical information was recorded, including age, gender, comorbid conditions, treatment history, and clinical evidence of chronic liver disease. Baseline laboratory investigations were obtained before initiation of antiviral therapy and included aspartate aminotransferase, alanine aminotransferase, platelet count, bilirubin, albumin, hemoglobin, and hepatitis C viral status as per hospital protocol. The FIB-4 score was calculated using the standard formula based on age, AST, ALT, and platelet count. After completion of the prescribed antiviral course, follow-up laboratory testing was repeated, and post-treatment FIB-4 score was calculated using the same standardized approach.

All patients received sofosbuvir and daclatasvir in standard recommended doses under the supervision of the treating physician. Compliance with therapy was assessed through follow-up visits, treatment cards, and medical record review. The primary outcome of the study was the mean change in FIB-4 score from baseline to post-treatment assessment. Secondary outcomes included changes in AST, ALT, platelet count, bilirubin, albumin, and distribution of patients across FIB-4 risk categories before and after treatment. Virological response at the end of treatment was also recorded where available from the medical record.

Data were entered and analyzed using SPSS version 26. Quantitative variables were presented as mean and standard deviation, whereas qualitative variables were expressed as frequencies and percentages. Pre- and post-treatment comparisons for continuous variables were performed using paired sample t-test for normally distributed data, while non-normally distributed variables were assessed using the Wilcoxon signed-rank test where appropriate. Categorical variables, including FIB-4 risk categories, were compared using the chi-square test or McNemar test according to the paired nature of the data. Post-stratification analysis was

carried out for age groups, gender, cirrhosis status, and prior treatment status to assess effect modification. A p-value of ≤ 0.05 was considered statistically significant.

Results

A total of 100 patients with chronic hepatitis C were included in the analysis. The overall mean age of the study population was 44.8 ± 11.6 years. There were 54 (54.0%) males and 46 (46.0%) females, showing a slight male predominance. Most participants belonged to the middle-age group, which is consistent with the usual clinical presentation of chronic hepatitis C in the Pakistani population presenting to tertiary care hospitals. Baseline demographic and clinical characteristics are summarized in Table 1.

Table 1: Baseline demographic and clinical characteristics of hepatitis C patients receiving sofosbuvir and daclatasvir (n=100)

Variable	Frequency (%) / Mean \pm SD
Age (years)	44.8 \pm 11.6
Age group 18–30 years	18 (18.0%)
Age group 31–45 years	34 (34.0%)
Age group 46–60 years	32 (32.0%)
Age group >60 years	16 (16.0%)
Male	54 (54.0%)
Female	46 (46.0%)
Weight (kg)	67.9 \pm 10.4
Duration of known hepatitis C (years)	3.6 \pm 1.9
Treatment-naïve patients	81 (81.0%)
Previously treated patients	19 (19.0%)
Diabetes mellitus	21 (21.0%)
Hypertension	28 (28.0%)
Baseline cirrhosis on ultrasound/clinical record	17 (17.0%)
Non-cirrhotic chronic liver disease	83 (83.0%)

At baseline, the study population showed mildly to moderately deranged liver-related biochemical and hematological parameters. After completion of therapy with sofosbuvir and daclatasvir, a marked improvement was observed in liver enzymes, platelet count, and derived fibrosis assessment by FIB-4 score. The mean FIB-4 score decreased from 2.98 ± 1.21 before treatment to 1.86 ± 0.88 after treatment, demonstrating a statistically significant reduction. Other laboratory changes are presented in Table 2.

Table 2: Comparison of laboratory parameters before and after treatment with sofosbuvir and daclatasvir (n=100)

Variable	Before treatment Mean \pm SD	After treatment Mean \pm SD	Mean Difference	p-value
AST (U/L)	78.4 \pm 29.7	36.9 \pm 14.8	-41.5	<0.001
ALT (U/L)	84.7 \pm 31.5	39.8 \pm 16.1	-44.9	<0.001
Platelet count ($\times 10^9/L$)	178.6 \pm 54.2	201.9 \pm 49.6	+23.3	0.002
Hemoglobin (g/dL)	12.6 \pm 1.7	12.9 \pm 1.6	+0.3	0.084
Total bilirubin (mg/dL)	1.21 \pm 0.46	0.89 \pm 0.29	-0.32	<0.001
Albumin (g/dL)	3.71 \pm 0.44	3.96 \pm 0.39	+0.25	<0.001
FIB-4 score	2.98 \pm 1.21	1.86 \pm 0.88	-1.12	<0.001

When the FIB-4 score was categorized into clinically relevant fibrosis risk groups, a substantial shift toward lower-risk categories was observed after treatment. Before therapy, 39.0% of patients had low-risk FIB-4 scores, 35.0% had intermediate-risk scores, and 26.0% had high-risk scores. After treatment, the proportion of patients in the low-risk category increased to 68.0%, whereas the intermediate- and high-risk categories decreased to 22.0% and 10.0%, respectively. This indicates an overall improvement in fibrosis-related risk profile after antiviral therapy (Table 3).

Table 3: Distribution of FIB-4 score categories before and after treatment (n=100)

FIB-4 category	Before treatment n (%)	After treatment n (%)
Low risk (<1.45)	39 (39.0%)	68 (68.0%)
Intermediate risk (1.45–3.25)	35 (35.0%)	22 (22.0%)
High risk (>3.25)	26 (26.0%)	10 (10.0%)

The overall treatment response was also reflected by virological clearance and parallel improvement in fibrosis-related markers. Sustained biochemical normalization was observed in a majority of patients, and end-of-treatment virological response was achieved in 92.0% of participants. Patients who achieved virological response had a greater mean reduction in FIB-4 score than those who did not respond adequately to treatment. These treatment outcome data are summarized in Table 4.

Table 4: Treatment outcomes and change in FIB-4 score after therapy (n=100)

Variable	n (%) / Mean ± SD
End-of-treatment virological response achieved	92 (92.0%)
No end-of-treatment virological response	8 (8.0%)
Patients with decreased FIB-4 score	84 (84.0%)
Patients with unchanged FIB-4 score	9 (9.0%)
Patients with increased FIB-4 score	7 (7.0%)
Mean reduction in FIB-4 among responders	1.21 ± 0.67
Mean reduction in FIB-4 among non-responders	0.34 ± 0.29
p-value for reduction in FIB-4 between responders and non-responders	0.001

Stratified analysis showed that the reduction in FIB-4 score was observed across age groups, sex, and cirrhosis status, but the magnitude of improvement was greater among non-cirrhotic and younger patients. Patients without cirrhosis showed a larger absolute reduction in FIB-4 score compared with cirrhotic patients. Similarly, treatment-naïve patients showed slightly better improvement than previously treated patients. These post-stratification findings are shown in Table 5.

Table 5: Post-stratification analysis of mean change in FIB-4 score according to baseline characteristics (n=100)

Variable	n	Mean change in FIB-4 score (Pre-Post) Mean ± SD	p-value
Age group			0.031
18–30 years	18	1.32 ± 0.61	
31–45 years	34	1.19 ± 0.65	
46–60 years	32	1.03 ± 0.58	
>60 years	16	0.79 ± 0.49	
Gender			0.218
Male	54	1.16 ± 0.63	
Female	46	1.06 ± 0.59	
Cirrhosis status			0.004
Cirrhotic	17	0.71 ± 0.46	
Non-cirrhotic	83	1.20 ± 0.61	
Treatment history			0.047
Treatment-naïve	81	1.17 ± 0.60	
Previously treated	19	0.84 ± 0.52	

Discussion

The present study demonstrates that SOF+DCV therapy significantly reduces FIB-4 scores in chronic HCV patients, with a mean decrease from 2.98 to 1.86 (p<0.001). This finding is consistent with Hsu et al., who reported a rapid decline in median FIB-4 from 2.88 to 2.22 at 12 weeks post-treatment in 395 DAA-treated patients, with a 98.2% SVR rate (11). Similarly, Huynh et al. documented a mean FIB-4 reduction from 3.84 to 2.37 (p<0.001), with durable improvement persisting through 96 weeks post-treatment, representing a 35% reduction in mean FIB-4 scores (12). The magnitude of FIB-4 reduction in our cohort (1.12 points) is comparable to these international studies, reinforcing the utility of FIB-4 as a practical and accessible tool for monitoring treatment response in resource-limited settings.

The end-of-treatment virological response (EOT-VR) rate of 92% observed in our study is consistent with published literature on SOF+DCV efficacy. Merat et al. reported an intention-to-treat SVR12 rate of 94.7% and a per-protocol rate of 98.8% among 1,361 patients treated with a fixed-dose combination of generic SOF+DCV across genotypes 1 through 4 in a multicenter phase III trial (13). Similarly, Belperio et al. demonstrated real-world SVR rates of 94.5% for genotype 2 and 90.8% for genotype 3 patients treated with DCV+SOF in a large Veterans Affairs cohort of 5,400 patients (14). The slightly lower response rate in our study may reflect differences in patient demographics, genotype distribution, treatment adherence patterns, or the inclusion of patients with advanced liver disease.

A notable finding of this study is the significant normalization of liver enzymes, with AST declining from 78.4 to 36.9 U/L and ALT from 84.7 to 39.8 U/L (both p<0.001). Huynh et al. similarly reported that 75.4% of DAA-treated patients achieved ALT normalization below the stringent 30/19 U/L criteria at 96 weeks post-treatment, confirming the durable hepatoprotective effect of viral eradication (12). The platelet count improvement observed in our cohort (178.6 to 201.9 × 10⁹/L, p=0.002) parallels findings by Chen et al., who documented significant platelet recovery in 41.7% of thrombocytopenic HCV patients following DAA treatment, with mean platelet counts increasing from 102 to 113 × 10³/μL at SVR12 (p<0.001) (15). This platelet improvement likely reflects reduced portal hypertension and splenic sequestration following resolution of hepatic inflammation and early fibrosis regression.

Serum albumin improved significantly in our patients (3.71 to 3.96 g/dL, p<0.001), a finding consistent with Martínez Herreros et al., who demonstrated significant albumin-bilirubin (ALBI) score improvement following DAA-induced SVR, with 89.1% of patients in ALBI grade 2 improving to grade 1 at 12 months (16). Tahata et al. further confirmed that such liver function recovery, particularly ALBI grade improvement, is associated with enhanced long-term prognosis in patients with compensated advanced liver fibrosis, with 76% of baseline ALBI grade 2 patients improving to grade 1 after SVR (21).

The shift in FIB-4 risk categories was a clinically meaningful observation in our study, with the proportion of low-risk patients increasing from 39% to 68% after treatment. This finding is corroborated by Kumada et al., who demonstrated that patients whose FIB-4 scores improved to below 1.50 following SVR had extremely low hepatocarcinogenesis rates during long-term follow-up, with no HCC development among 547 such patients over a 5-year period (20). Such FIB-4-based risk reclassification carries important implications for tailoring post-treatment surveillance intensity.

Our finding that non-cirrhotic patients experienced significantly greater FIB-4 improvement compared to cirrhotic patients (p=0.004) is supported by Leuştean et al., who demonstrated that while both cirrhotic and non-cirrhotic patients showed significant FIB-4 reductions after DAA-induced SVR (p<0.001), FIB-4 continued to correlate with FibroTest only in the cirrhotic group, suggesting more complete normalization of fibrosis markers in non-cirrhotic patients (17). This underscores the importance of early treatment initiation before the development of advanced fibrosis. Treatment-naïve patients in our study also achieved superior FIB-4 improvement compared to previously treated patients (p=0.047). Pabjan et al. similarly identified prior treatment failure as an independent predictor of reduced virological response in the DAA era, alongside liver cirrhosis and male sex (19), while Belperio et al. reported that treatment experience was significantly associated with lower SVR rates (OR 0.51, p<0.001) among genotype 3 patients (14).

The age-related differences in FIB-4 response observed in our study (p=0.031), with younger patients demonstrating greater improvement, align closely with findings from Niu et al., who reported that elderly patients (≥60 years) maintained higher post-treatment FIB-4 values compared to younger counterparts despite achieving significant absolute reductions in both groups (18). These findings suggest that age-related hepatic senescence and cumulative fibrotic burden may limit the liver's

regenerative capacity even after successful viral eradication, emphasizing the benefit of treating HCV patients at a younger age.

In the Pakistani context, our results are particularly significant given the country's enormous HCV disease burden. The demonstrated effectiveness of SOF+DCV in reducing FIB-4 scores complements earlier Pakistani studies showing high virological response rates with this affordable regimen across diverse clinical settings, including special populations such as hemodialysis patients (22). The accessibility of generic SOF+DCV formulations in Pakistan, combined with our evidence of meaningful fibrosis improvement as measured by FIB-4, strongly supports the continued use of this regimen as a cornerstone of Pakistan's national HCV elimination strategy. Our findings emphasize the need for early identification and treatment of HCV-infected individuals, particularly younger, treatment-naïve, non-cirrhotic patients who stand to benefit most from DAA therapy in terms of fibrosis regression and long-term hepatic outcomes.

Conclusion

Treatment with sofosbuvir and daclatasvir led to significant reduction in FIB-4 score, indicating improvement in fibrosis-related risk among chronic hepatitis C patients. This regimen appears effective not only for virological control but also for early non-invasive hepatic recovery assessment in the Pakistani clinical setting.

Declarations

Data Availability statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department concerned. (IRBEC-AZBSHGJ-2389-24)

Consent for publication

Approved

Funding

Not applicable

Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

KG (PGR), AH (GP)

Contributed to study design, data collection and initial manuscript drafting

Assisted in data acquisition, literature review and manuscript editing

Performed statistical analysis and contributed to interpretation of results

Provided guidance in study execution and critically reviewed the manuscript

SBH (HOD), NG (HO), JA (GP)

Helped in methodology development, data organization and manuscript formatting

Contributed to patient recruitment, data entry and results compilation

Assisted in referencing, proofreading and final revisions of the manuscript

Supervised the research, coordinated among authors, finalized the manuscript and approved the final version

All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

References

1. Spearman CW, Dusheiko GM, Hellard M, Sonderup M. Hepatitis C. *Lancet*. 2019;394(10207):1451-1466. [https://doi.org/10.1016/S0140-6736\(19\)32320-7](https://doi.org/10.1016/S0140-6736(19)32320-7)
2. Cui F, Blach S, Manzengo Mingiedi C, Alonso Gonzalez M, Sabry Alaama A, Mozalevskis A, et al. Global reporting of progress towards elimination of hepatitis B and hepatitis C. *Lancet Gastroenterol Hepatol*. 2023;8(4):332-342. [https://doi.org/10.1016/S2468-1253\(22\)00386-7](https://doi.org/10.1016/S2468-1253(22)00386-7)
3. Mahmud S, Al Kanaani Z, Abu-Raddad LJ. Characterization of the hepatitis C virus epidemic in Pakistan. *BMC Infect Dis*. 2019;19(1):809. <https://doi.org/10.1186/s12879-019-4403-7>
4. Mooneyhan E, Qureshi H, Mahmood H, Tariq M, Maqbool NA, Anwar M, et al. Hepatitis C prevalence and elimination planning in Pakistan, a bottom-up approach accounting for provincial variation. *J Viral Hepat*. 2023;30(4):345-354. <https://doi.org/10.1111/jvh.13802>
5. Patel K, Asrani SK, Fiel MI, Levine D, Leung DH, Duarte-Rojo A, et al. Accuracy of blood-based biomarkers for staging liver fibrosis in chronic liver disease: a systematic review supporting the AASLD Practice Guideline. *Hepatology*. 2025;81(1):358-379. <https://doi.org/10.1097/HEP.0000000000000842>
6. Ghoneim S, Butt MU, Trujillo S, Asaad I. FIB-4 regression with direct-acting antiviral therapy in patients with hepatitis C infection: a safety-net hospital experience. *Front Med (Lausanne)*. 2020;7:359. <https://doi.org/10.3389/fmed.2020.00359>
7. Elbaz T, Abdo M, Omar H, Hassan EA, Zaghoul AM, Abdel-Samiee M, et al. Efficacy and safety of sofosbuvir and daclatasvir with or without ribavirin in elderly patients with chronic hepatitis C virus infection. *J Med Virol*. 2019;91(2):272-277. <https://doi.org/10.1002/jmv.25287>
8. Butt N, Anoshia, Khan MA, Akbar A. Effectiveness of sofosbuvir and daclatasvir in treatment of hepatitis-C: an experience of tertiary care hospital in Karachi. *Pak J Med Sci*. 2021;37(7):2014-2019. <https://doi.org/10.12669/pjms.37.7.4627>
9. Mushtaq S, Akhter TS, Khan A, Sohail A, Khan A, Manzoor S. Efficacy and safety of generic sofosbuvir plus daclatasvir and sofosbuvir/velpatasvir in HCV genotype 3-infected patients: real-world outcomes from Pakistan. *Front Pharmacol*. 2020;11:550205. <https://doi.org/10.3389/fphar.2020.550205>
10. Cheng CH, Chu CY, Chen HL, Lin IT, Wu CH, Lee YK, et al. Direct-acting antiviral therapy of chronic hepatitis C improves liver fibrosis, assessed by histological examination and laboratory markers. *J Formos Med Assoc*. 2021;120(5):1259-1268. <https://doi.org/10.1016/j.jfma.2020.11.018>
11. Hsu WF, Lai HC, Su WP, Lin CH, Chuang PH, Chen SH, et al. Rapid decline of noninvasive fibrosis index values in patients with hepatitis C receiving treatment with direct-acting antiviral agents. *BMC Gastroenterol*. 2019;19(1):63. <https://doi.org/10.1186/s12876-019-0973-5>
12. Huynh T, Ma S, Hu KQ. HCV direct acting antiviral treatment leads to highly durable rates of ALT and AST lower than 30/19 criteria and improved APRI and FIB-4 scores. *Hepatol Commun*. 2022;6(12):3496-3504. <https://doi.org/10.1002/hep4.2098>
13. Merat S; SD1000 Research Team. SD1000: high sustained viral response rate in 1361 patients with hepatitis C genotypes 1, 2, 3, and 4 using a low-cost, fixed-dose combination tablet of generic sofosbuvir and

- daclatasvir: a multicenter, phase III clinical trial. *Clin Infect Dis*. 2020;70(10):2206-2212. <https://doi.org/10.1093/cid/ciz628>
14. Belperio PS, Shahoumian TA, Loomis TP, Mole LA, Backus LI. Real-world effectiveness of daclatasvir plus sofosbuvir and velpatasvir/sofosbuvir in hepatitis C genotype 2 and 3. *J Hepatol*. 2019;70(1):15-23. <https://doi.org/10.1016/j.jhep.2018.09.018>
15. Chen YC, Tseng CW, Tseng KC. Rapid platelet count improvement in chronic hepatitis C patients with thrombocytopenia receiving direct-acting antiviral agents. *Medicine (Baltimore)*. 2020;99(19):e20156. <https://doi.org/10.1097/MD.00000000000020156>
16. Martínez Herreros Á, Sangro B, García Rodríguez A, Pérez Grijalba V. Analysis of the albumin-bilirubin score as an indicator of improved liver function among hepatitis C virus patients with sustained viral response after direct-acting antiviral therapy. *JGH Open*. 2022;6(7):496-502. <https://doi.org/10.1002/jgh3.12779>
17. Leuştean A, Popescu C, Nichita L, Tilişcan C, Aramă V. Dynamics of APRI and FIB-4 in HCV cirrhotic patients who achieved SVR after DAA therapy. *Exp Ther Med*. 2021;21(1):99. <https://doi.org/10.3892/etm.2020.9531>
18. Niu B, Zang W, Zhou H, Mi Y, Lu C, Li P. Regression in hepatic fibrosis in elderly Chinese patients with hepatitis C receiving direct-acting antiviral treatment. *BMC Gastroenterol*. 2023;23:102. <https://doi.org/10.1186/s12876-023-02732-4>
19. Pabjan P, Brzdek M, Chrapek M, Dziedzic K, Dobrowolska K, Paluch K, et al. Are there still difficult-to-treat patients with chronic hepatitis C in the era of direct-acting antivirals? *Viruses*. 2022;14(1):96. <https://doi.org/10.3390/v14010096>
20. Kumada T, Toyoda H, Yasuda S, Tada T, Tanaka J. Usefulness of serial FIB-4 score measurement for predicting the risk of hepatocarcinogenesis after hepatitis C virus eradication. *Eur J Gastroenterol Hepatol*. 2021;33(1S Suppl 1):e513-e521. <https://doi.org/10.1097/MEG.0000000000002139>
21. Tahata Y, Sakamori R, Yamada R, Kodama T, Hikita H, Hagiwara H, et al. Improved liver function after sustained virologic response enhanced prognosis in hepatitis C with compensated advanced liver fibrosis. *Dig Dis Sci*. 2023;68(5):2115-2122. <https://doi.org/10.1007/s10620-022-07629-y>
22. Cheema SUR, Rehman MS, Hussain G, Cheema SS, Gilani N. Efficacy and tolerability of sofosbuvir and daclatasvir for treatment of hepatitis C genotype 1 and 3 in patients undergoing hemodialysis: a prospective interventional clinical trial. *BMC Nephrol*. 2019;20(1):438. <https://doi.org/10.1186/s12882-019-1631-4>



Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, <http://creativecommons.org/licenses/by/4.0-nc/>. © The Author(s) 2025