

UDC 616.36-002.14-036.82-085.322

**THE IMPACT OF MEDICINAL PLANTS ON ASTHENIA, DYSPEPSIA, AND
QUALITY OF LIFE IN REHABILITATION AFTER CHRONIC HEPATITIS C**

Yakubova Ranokhon Maksimovna,

Assistant of the Department of Infectious Diseases,
Andijan State Medical Institute, Andijan, Uzbekistan

Abstract. Chronic hepatitis C is now a curable infection for the vast majority of patients treated with direct-acting antivirals, yet clinical rehabilitation does not end with viral eradication. A proportion of patients continue to report asthenia, nonspecific dyspeptic complaints, reduced vitality, and an incomplete recovery of health-related quality of life after achieving sustained virologic response. This article reviews the possible role of medicinal plants as an adjunctive component of post-hepatitis C rehabilitation. The paper was prepared as a structured narrative review based on contemporary hepatology guidance, studies on patient-reported outcomes after antiviral therapy, and publications evaluating phytotherapeutic interventions relevant to fatigue, dyspepsia, and liver support. The available evidence indicates that most patients experience measurable improvement in quality of life after successful antiviral treatment; however, symptom persistence remains clinically important, particularly in those with advanced fibrosis, comorbidity, or psychosocial burden. Among medicinal plants, silymarin is the best studied in chronic hepatitis C, but oral formulations have not shown convincing benefits for virologic or biochemical endpoints. By contrast, plant-based combinations such as peppermint oil and caraway oil have more persuasive evidence for functional dyspeptic symptoms, although not specifically in post-hepatitis C populations. Evidence for phytotherapeutic relief of asthenia is promising but indirect, coming mainly from broader post-viral fatigue research. The modern conclusion is that medicinal plants may be considered only as individualized adjuncts within a rehabilitation program that also includes lifestyle counseling, nutritional correction, psychological support, and structured follow-up. They should not replace etiologic treatment, fibrosis surveillance, or standard symptom-oriented medical care.

Keywords: chronic hepatitis C, rehabilitation, medicinal plants, phytotherapy, asthenia, dyspepsia, quality of life, silymarin, post-viral fatigue

**ВЛИЯНИЕ ЛЕКАРСТВЕННЫХ РАСТЕНИЙ НА АСТЕНИЮ, ДИСПЕПСИЮ И
КАЧЕСТВО ЖИЗНИ В РЕАБИЛИТАЦИИ ПОСЛЕ ХРОНИЧЕСКОГО ГЕПАТИТА
С**

Аннотация. Хронический гепатит С в настоящее время относится к излечимым инфекциям у большинства пациентов, получающих терапию прямыми противовирусными препаратами. Однако клиническая реабилитация не заканчивается элиминацией вируса. У части больных после достижения устойчивого вирусологического ответа сохраняются астения, неспецифические диспепсические жалобы, снижение жизненного тонуса и неполное восстановление показателей качества жизни, связанного со здоровьем. В статье рассматривается возможная роль лекарственных растений как вспомогательного компонента реабилитации после хронического гепатита С. Работа выполнена в формате структурированного нарративного обзора на основе современных гепатологических рекомендаций, исследований пациент-ориентированных исходов после противовирусной терапии и публикаций, посвящённых фитотерапевтическим вмешательствам, имеющим отношение к утомляемости, диспепсии и поддержке функции печени. Доступные данные показывают, что после успешного противовирусного лечения качество жизни у

большинства пациентов улучшается, однако сохранение симптомов остаётся клинически значимым, особенно при выраженном фиброзе, сопутствующих заболеваниях и психосоциальной нагрузке. Среди лекарственных растений наиболее изучен силимарин, но пероральные формы не продемонстрировали убедительного влияния на вирусологические и биохимические показатели. Напротив, растительные комбинации на основе масла мяты перечной и тмина имеют более убедительную доказательную базу в отношении функциональной диспепсии, хотя исследования именно у пациентов после гепатита С ограничены. Данные о влиянии фитотерапии на астению выглядят многообещающими, но в основном носят косвенный характер и основаны на исследованиях поствирусной усталости в более широких группах пациентов. Следовательно, лекарственные растения могут рассматриваться только как индивидуализированное дополнение к реабилитационной программе, включающей модификацию образа жизни, коррекцию питания, психологическую поддержку и динамическое наблюдение. Они не должны заменять этиологическое лечение, контроль фиброза и стандартную симптом-ориентированную медицинскую помощь.

Ключевые слова: хронический гепатит С, реабилитация, лекарственные растения, фитотерапия, астения, диспепсия, качество жизни, силимарин, поствирусная усталость

INTRODUCTION

The therapeutic landscape of chronic hepatitis C has changed profoundly in the era of direct-acting antivirals. Sustained virologic response is now achieved in the overwhelming majority of adherent patients, and current guidance treats SVR as virologic cure. For noncirrhotic patients, routine follow-up after SVR is generally the same as for persons never infected with HCV, whereas patients with cirrhosis still require structured surveillance for hepatocellular carcinoma and complications of portal hypertension [1, 2].

Even so, the end of antiviral therapy does not always coincide with full functional recovery. Clinical practice increasingly shows that some patients continue to report weakness, low exercise tolerance, dyspeptic discomfort, sleep disturbance, reduced emotional well-being, and a subjective sense that “being cured” is not identical to “feeling healthy.” Prospective and qualitative studies confirm that viral eradication usually improves health-related quality of life, but not every physical or psychosocial burden resolves immediately or completely [3-6].

This gap between virologic success and lived recovery creates a rehabilitation space in which supportive, low-burden interventions become relevant. In many post-infectious and chronic liver care settings, patients express interest in medicinal plants because they are perceived as gentle, culturally familiar, and compatible with long-term use. However, a scientifically responsible approach requires a clear distinction between antiviral treatment, which medicinal plants cannot replace, and adjunctive rehabilitation, where symptom-targeted phytotherapy may have a selective role [7-15].

The purpose of this article is to evaluate the possible impact of medicinal plants on three clinically meaningful rehabilitation outcomes after chronic hepatitis C: asthenia, dyspepsia, and quality of life. Particular attention is paid to the strength of evidence, the difference between HCV-specific and indirect evidence, and the safety limitations that are essential in patients with current or previous liver disease.

MATERIALS AND METHODS

This article was prepared as a structured narrative review in accordance with the IMRAD format. The review synthesized publications from contemporary hepatology, infectious diseases, gastroenterology, and phytotherapy literature. Priority was given to clinical practice guidance

documents, prospective cohort studies, randomized clinical trials, systematic reviews, and meta-analyses relevant to post-SVR follow-up, patient-reported outcomes after HCV cure, medicinal plants used in chronic liver disease, and herbal interventions for fatigue or functional dyspepsia [1-15].

The analytical framework focused on four questions. First, what symptoms and quality-of-life limitations remain clinically relevant after successful treatment of chronic hepatitis C? Second, which medicinal plants or plant-based combinations have been studied directly in chronic hepatitis C or in closely related symptom complexes? Third, how convincing is the available evidence for asthenia, dyspepsia, and global quality of life? Fourth, what safety considerations should modify the use of phytotherapy in rehabilitation after liver disease? Because the available literature is heterogeneous and only partly HCV-specific, the conclusions of this review are intentionally cautious and emphasize individualized adjunctive use rather than universal recommendation.

RESULTS

The reviewed evidence shows that the concept of rehabilitation after chronic hepatitis C is clinically justified, but it must be interpreted differently according to the severity of liver disease and the persistence of symptoms. Modern guidance strongly supports the idea that noncirrhotic patients who achieve SVR do not require a separate liver-centered medical pathway in the absence of other risk factors, while patients with cirrhosis remain under long-term surveillance. Nevertheless, both groups may continue to experience fatigue, reduced vitality, abdominal discomfort, anxiety about residual disease, and uncertainty about self-care after cure [1, 2, 6].

Several studies demonstrate that quality of life improves after successful DAA therapy, but the pattern of recovery is uneven. Huang and colleagues reported long-term improvement in health-related quality of life in the first years after viral clearance, while Yi and co-authors found significant gains in patient-reported outcomes after SVR. Fagundes and colleagues also showed that interferon-free treatment was associated with improvements in both fatigue and health-related quality of life. At the same time, the same body of evidence indicates that baseline cirrhosis, age, comorbidity, psychological burden, and social determinants influence the depth and speed of recovery [3-5].

From a rehabilitation perspective, asthenia deserves special attention. In patients with a history of chronic hepatitis C, fatigue is usually multifactorial. It may reflect previous chronic inflammation, persistent sleep disturbance, anxiety, sarcopenia, reduced physical conditioning, autonomic dysregulation, metabolic dysfunction, or unresolved liver disease in patients with advanced fibrosis. This multifactorial nature explains why no single plant-based remedy should be expected to eliminate asthenia on its own. Instead, any phytotherapeutic approach must be integrated with graded physical activity, sleep optimization, nutritional correction, and assessment of anemia, thyroid dysfunction, depression, and ongoing liver injury [3-6].

Among medicinal plants, silymarin derived from *Silybum marianum* remains the best known and most widely discussed in chronic hepatitis C. Its attractiveness is based on antioxidant, membrane-stabilizing, and anti-inflammatory mechanisms described in experimental literature, as well as its long-standing use as a “liver support” product in many countries. However, the clinical evidence is more restrained than popular perception suggests. In the randomized trial by Fried et al., high-dose oral silymarin did not significantly improve serum ALT compared with placebo in patients with chronic hepatitis C who had previously failed interferon-based therapy. Likewise, the meta-analysis by Yang et al. concluded that although silymarin was generally well tolerated, oral preparations had not demonstrated convincing virologic or biochemical benefit in this population [7, 9].

At the same time, the evidence for silymarin is not entirely dismissive. In the HALT-C cohort analysis, baseline silymarin use was associated with reduced progression from fibrosis to cirrhosis, although it did not translate into better major clinical outcomes. This finding suggests that silymarin may still deserve a place in discussions about adjunctive liver support, but only with realistic expectations. In modern rehabilitation after hepatitis C, its value is more defensible as a patient-preferred supportive option than as a clearly proven disease-modifying strategy [8].

The evidence base becomes stronger when the focus shifts from liver-specific endpoints to dyspeptic symptoms. Many post-HCV patients describe epigastric heaviness, fullness, nausea, bloating, or early satiety even after viral cure. These symptoms are not always caused by active liver injury and often overlap with functional dyspepsia, biliary dyskinesia, altered gastrointestinal motility, or stress-related gut-brain interaction. In this setting, plant-based therapies that have evidence in functional dyspepsia become clinically relevant after structural and hepatobiliary causes are excluded [10, 11].

The combination of peppermint oil and caraway oil is the best supported phytotherapeutic option for this symptom cluster. The systematic review and meta-analysis by Li et al. found that this combination was effective and safe in functional dyspepsia, particularly for global symptom relief and epigastric pain. The broader review by Gwee and colleagues also emphasized that selected herbal products may provide benefit in functional dyspepsia because they can influence multiple pathophysiological pathways simultaneously, including motility, visceral sensitivity, secretion, and mucosal protection. For rehabilitation after chronic hepatitis C, this does not amount to disease-specific evidence, but it offers a rational symptom-oriented option for carefully selected patients with post-cure dyspeptic complaints [10, 11].

The situation is more complex for asthenia. Direct trials of medicinal plants specifically in patients recovering from chronic hepatitis C are scarce. Therefore, much of the reasoning in this area is indirect. The 2024 systematic review by Hu et al. on Chinese herbal medicine for post-viral fatigue suggested potential improvement in fatigue symptoms across heterogeneous post-viral populations. Yet the included trials varied in quality, formulas, and clinical settings, and they cannot be transferred uncritically to post-hepatitis C rehabilitation. Still, this evidence supports the hypothesis that certain phytotherapeutic approaches may modulate fatigue perception when used as part of a broader rehabilitation package [12].

Quality of life is a broader endpoint than symptom intensity alone. In patients after HCV cure, quality of life depends not only on fatigue and dyspepsia, but also on emotional recovery, confidence about future health, return to work, body image, social functioning, and the decline of illness-related stigma. Qualitative work has shown that patients can experience both relief and uncertainty after cure. Therefore, if medicinal plants are used in rehabilitation, their success should not be judged by laboratory changes alone. More relevant outcomes may include improved appetite, reduced postprandial discomfort, better subjective energy, less dependence on symptomatic medication, and a gradual return to ordinary daily activity [3-6].

Safety is the most important limiting factor in this field. The belief that all natural products are harmless is not supported by hepatology literature. Systematic review data have documented numerous cases of herb-induced liver injury, and both AASLD and EASL guidance stress that herbal and dietary supplements may cause clinically significant hepatotoxicity or complicate diagnostic assessment of abnormal liver tests. This consideration is particularly important in patients with residual fibrosis, prior decompensation, polypharmacy, or concurrent metabolic liver disease [13-15].

For that reason, the rational use of medicinal plants after chronic hepatitis C requires a structured algorithm. Patients should first undergo clinical assessment to determine whether their main complaint reflects persistent liver disease, an extrahepatic problem, or a functional

symptom complex. Second, the chosen plant product should have a plausible mechanism and at least some clinical evidence relevant to the target symptom. Third, its composition and manufacturer quality should be transparent. Fourth, therapy should be time-limited and outcome-oriented, with predefined clinical goals. Finally, any worsening of liver tests or new symptoms should prompt immediate reassessment and discontinuation of the supplement until safety is clarified [1, 2, 13-15].

DISCUSSION

The main conclusion of this review is that medicinal plants have a possible but clearly secondary role in rehabilitation after chronic hepatitis C. Their place is not in viral eradication, fibrosis staging, or cancer surveillance, which remain domains of evidence-based hepatology. Rather, phytotherapy may be useful when rehabilitation is defined in a narrower and clinically realistic way: reduction of residual symptom burden, support of subjective recovery, and improvement of everyday functioning in carefully selected patients [1, 2].

This distinction is crucial because the post-HCV period is often misunderstood by both patients and clinicians. Some patients believe that cure should immediately normalize all aspects of physical and emotional well-being. When this does not happen, they may either become disappointed or start unsupervised use of multiple “liver cleansing” products. The literature reviewed here suggests a better approach. First, clinicians should explain that quality-of-life recovery is usually favorable but not always immediate. Second, persistent symptoms should be phenotyped properly. Third, adjunctive options, including medicinal plants, should be matched to the symptom pattern rather than to the diagnostic label alone [3-6].

In this context, the evidence hierarchy matters. Silymarin has the strongest historical association with hepatitis C, but its direct clinical benefits in chronic HCV populations are limited and should not be overstated. Its use may still be reasonable in some rehabilitation settings when the aim is patient-centered supportive care and when expectations are conservative. However, for dyspeptic symptoms, the literature actually appears more convincing for specific herbal combinations studied in functional dyspepsia than for silymarin itself. This illustrates an important methodological lesson: the most “popular liver herb” is not automatically the most useful product for the most troublesome post-cure symptom [7-11].

Asthenia remains the most challenging target. The absence of robust HCV-specific phytotherapy trials means that any recommendation must remain provisional. The indirect evidence from post-viral fatigue research is encouraging but insufficient for strong endorsement. For clinicians, this means that medicinal plants for fatigue should be considered only after excluding treatable causes and only within a rehabilitation plan that gives primary importance to physical reconditioning, sleep hygiene, mood assessment, and nutritional support. In practical terms, phytotherapy may be an adjunct, but it should never become a substitute for diagnostic clarity [12].

Safety concerns further justify a restrained approach. Patients with liver disease are particularly vulnerable to harm from poorly regulated supplements, variable dosing, contamination, and unrecognized interactions. The fact that many herbal products are marketed as “detoxifying” or “hepatoprotective” makes critical supervision even more necessary. In a post-HCV setting, new elevations of aminotransferases should not automatically be attributed to “residual hepatitis”; supplement-related injury must remain part of the differential diagnosis [13-15].

Thus, the modern model of post-hepatitis C rehabilitation should be multimodal. Medicinal plants can be included when there is a clear symptom target, a credible evidence base, acceptable safety, and informed patient consent. Their contribution is most likely to be meaningful in

symptom-oriented pathways for functional dyspepsia and possibly in selected fatigue-dominant patients, while their role in improving global quality of life is probably indirect and mediated by symptom relief, patient engagement, and a greater sense of agency.

CONCLUSION

Rehabilitation after chronic hepatitis C should be understood as a stage of restoring function, well-being, and confidence after virologic cure rather than as a continuation of antiviral treatment. In this stage, asthenia, dyspepsia, and incomplete recovery of quality of life may remain clinically relevant for a subset of patients.

The available evidence suggests that medicinal plants may have a limited but meaningful adjunctive role in this setting. Oral silymarin is well known and generally tolerated, yet its benefits in chronic hepatitis C remain inconsistent and modest. Plant-based combinations such as peppermint oil and caraway oil appear more promising for functional dyspeptic complaints. Evidence for fatigue relief is still indirect and should be interpreted cautiously.

Accordingly, medicinal plants should be recommended only as individualized supportive measures after proper clinical evaluation, with attention to product quality, monitoring, and the risk of herb-induced liver injury. The most rational rehabilitation strategy after chronic hepatitis C remains comprehensive and multidisciplinary, combining follow-up according to fibrosis stage, nutritional support, physical activity, psychosocial care, and selectively chosen phytotherapeutic interventions.

References

1. American Association for the Study of Liver Diseases, & Infectious Diseases Society of America. (2023, December 19). Monitoring patients who are starting HCV treatment, are on treatment, or have completed therapy. HCV Guidance. <https://www.hcvguidelines.org/evaluate/monitoring>
2. Reiberger, T., Lens, S., Cabibbo, G., Nahon, P., Zignego, A. L., Deterding, K., Elsharkawy, A. M., & Forns, X. (2024). EASL position paper on clinical follow-up after HCV cure. *Journal of Hepatology*, 81(2), 326-344. <https://doi.org/10.1016/j.jhep.2024.04.007>
3. Huang, R., Shang, J., Chen, H., Li, J., Xie, Q., Feng, J., Wei, L., & Rao, H. (2024). Sustained virologic response improved the long-term health-related quality of life in patients with chronic hepatitis C: A prospective national study in China. *BMC Infectious Diseases*, 24, 72. <https://doi.org/10.1186/s12879-023-08940-3>
4. Yi, C.-H., Bair, M.-J., Wang, J.-H., Wong, M.-W., Liu, T.-T., Lei, W.-Y., Liang, S.-W., Lin, L., Hung, J.-S., Huang, J.-F., Hsu, Y.-C., & Chen, C.-L. (2022). Improvement of patient-reported outcomes in patients achieving sustained virologic response with direct-acting antivirals for hepatitis C virus infection. *Journal of Microbiology, Immunology and Infection*, 55(4), 643-650.
5. Fagundes, R. N., Ferreira, L. E. V. V. de C., & Pace, F. H. de L. (2020). Health-related quality of life and fatigue in patients with chronic hepatitis C with therapy with direct-acting antivirals agents interferon-free. *PLoS ONE*, 15(8), e0237005. <https://doi.org/10.1371/journal.pone.0237005>
6. Guggisberg, H., Nicca, D., Kohler, A., Bruggmann, P., & Künzler-Heule, P. (2022). "Shaping the new freedom": A reflexive thematic analysis on patients' post cure needs after years of living with hepatitis C. *Swiss Medical Weekly*, 152, w30177.
7. Fried, M. W., Navarro, V. J., Afdhal, N., Belle, S. H., Wahed, A. S., Hawke, R. L., Doo, E., Meyers, C. M., Reddy, K. R., & Silymarin in NASH and C Hepatitis (SynCH) Study Group. (2012). Effect of silymarin (milk thistle) on liver disease in patients with

- chronic hepatitis C unsuccessfully treated with interferon therapy: A randomized controlled trial. *JAMA*, 308(3), 274-282. <https://doi.org/10.1001/jama.2012.8265>
8. Freedman, N. D., Curto, T. M., Morishima, C., Seeff, L. B., Goodman, Z. D., Wright, E. C., Sinha, R., & HALT-C Trial Group. (2011). Silymarin use and liver disease progression in the Hepatitis C Antiviral Long-Term Treatment against Cirrhosis trial. *Alimentary Pharmacology & Therapeutics*, 33(1), 127-137. <https://doi.org/10.1111/j.1365-2036.2010.04503.x>
 9. Yang, Z., Zhuang, L., Lu, Y., Xu, Q., & Chen, X. (2014). Effects and tolerance of silymarin (milk thistle) in chronic hepatitis C virus infection patients: A meta-analysis of randomized controlled trials. *BioMed Research International*, 2014, 941085. <https://doi.org/10.1155/2014/941085>
 10. Li, J., Lv, L., Zhang, J., Xu, L., Zeng, E., Zhang, Z., Wang, F., & Tang, X. (2019). A combination of peppermint oil and caraway oil for the treatment of functional dyspepsia: A systematic review and meta-analysis. *Evidence-Based Complementary and Alternative Medicine*, 2019, 7654947. <https://doi.org/10.1155/2019/7654947>
 11. Gwee, K.-A., Holtmann, G., Tack, J., Suzuki, H., Liu, J., Xiao, Y., Chen, M.-H., Hou, X., Wu, D.-C., Toh, C., Lu, F., & Tang, X.-D. (2021). Herbal medicines in functional dyspepsia—Untapped opportunities not without risks. *Neurogastroenterology & Motility*, 33(2), e14044. <https://doi.org/10.1111/nmo.14044>
 12. Hu, L.-Y., Cai, A.-Q., Li, B., Li, Z., Liu, J.-P., & Cao, H.-J. (2024). Chinese herbal medicine for post-viral fatigue: A systematic review of randomized controlled trials. *PLoS ONE*, 19(3), e0300896. <https://doi.org/10.1371/journal.pone.0300896>
 13. Ballotin, V. R., Bigarella, L. G., Brandão, A. B. M., Balbinot, R. A., Balbinot, S. S., & Soldera, J. (2021). Herb-induced liver injury: Systematic review and meta-analysis. *World Journal of Clinical Cases*, 9(20), 5490-5513. <https://doi.org/10.12998/wjcc.v9.i20.5490>
 14. Chalasani, N., Bonkovsky, H. L., Fontana, R., Lee, W., Stolz, A., Talwalkar, J., Reddy, K. R., Watkins, P. B., Navarro, V., Barnhart, H., Gu, J., Serrano, J., & United States Drug Induced Liver Injury Network. (2023). Drug, herbal, and dietary supplement-induced liver injury: AASLD practice guidance. *American Association for the Study of Liver Diseases*. <https://www.aasld.org/practice-guidelines/drug-herbal-and-dietary-supplement-induced-liver-injury>
 15. European Association for the Study of the Liver. (2019). EASL Clinical Practice Guidelines: Drug-induced liver injury. *Journal of Hepatology*, 70(6), 1222-1261. <https://doi.org/10.1016/j.jhep.2019.02.014>