## Contents

### EDITORIAL

2927 Close relationship between mediators of inflammation and pancreatic cancer: Our experience  
*Vescio F, Ammendola M, Curro G, Curcio S*

2931 Understanding the molecular crossroads in acute liver failure: A pathway to new therapies  
*Cheng CY, Hao WR, Cheng TH*

2934 From macroautophagy to mitophagy: Unveiling the hidden role of mitophagy in gastrointestinal disorders  
*Gao DL, Liu MR, Ge N, Guo JT, Yang F, Sun SY*

2947 Gastroesophageal reflux after per-oral endoscopic myotomy: Management literature  
*Tawheed A, Bahcecioglu IH, Yalniz M, El-Kassas M*

2954 Advancing hepatic recompensation: Baveno VII criteria and therapeutic innovations in liver cirrhosis management  
*Ridola L, Del Cioppo S*

2959 Early colorectal cancer screening–no time to lose  

### REVIEW

2964 Role of gut-liver axis and glucagon-like peptide-1 receptor agonists in the treatment of metabolic dysfunction-associated fatty liver disease  
*Rochoń J, Kalinowski P, Szymanek-Majchrzak K, Grąt M*

### ORIGINAL ARTICLE

**Retrospective Study**

2981 Fifty-five cases of hepatic alveolar echinococcosis combined with lymph node metastasis: A retrospective study  
*Aimaitijiang Y, Jiang TM, Shao YM, Aji T*

2991 Establishing and clinically validating a machine learning model for predicting unplanned reoperation risk in colorectal cancer  
*Cai LQ, Yang DQ, Wang RJ, Huang H, Shi YX*

**Prospective Study**

3005 Double contrast-enhanced ultrasonography improves diagnostic accuracy of T staging compared with multi-detector computed tomography in gastric cancer patients  
*Xu YF, Ma HY, Huang GL, Zhang YT, Wang XY, Wei MJ, Pei XQ*
ABOUT COVER
Editorial Board Member of World Journal of Gastroenterology, Hasan Ozen, MD, Professor, Department of Pediatrics, Division of Gastroenterology, Hepatology and Nutrition, Hacettepe University School of Medicine, Ankara 06100, Türkiye. haozen@hacettepe.edu.tr

AIMS AND SCOPE
The primary aim of World Journal of Gastroenterology (WJG, World J Gastroenterol) is to provide scholars and readers from various fields of gastroenterology and hepatology with a platform to publish high-quality basic and clinical research articles and communicate their research findings online. WJG mainly publishes articles reporting research results and findings obtained in the field of gastroenterology and hepatology and covering a wide range of topics including gastroenterology, hepatology, gastrointestinal endoscopy, gastrointestinal surgery, gastrointestinal oncology, and pediatric gastroenterology.

INDEXING/ABSTRACTING
The WJG is now abstracted and indexed in Science Citation Index Expanded (SCIE), MEDLINE, PubMed, PubMed Central, Scopus, Reference Citation Analysis, China Science and Technology Journal Database, and Superstar Journals Database. The 2023 edition of Journal Citation Reports cites the 2022 impact factor (IF) for WJG as 4.3; Quartile category: Q2. The WJG’s CiteScore for 2023 is 7.8.

RESPONSIBLE EDITORS FOR THIS ISSUE
Production Editor: Xiao-Mei Zheng; Production Department Director: Xu Guo; Cover Editor: Jia-Ru Fan.

NAME OF JOURNAL
World Journal of Gastroenterology

ISSN
ISSN 1007-9327 (print) ISSN 2219-2840 (online)

LAUNCH DATE
October 1, 1995

FREQUENCY
Weekly

EDITORS-IN-CHIEF
Andrzej S Tarnawski

EXECUTIVE ASSOCIATE EDITORS-IN-CHIEF
Xian-Jun Yu (Pancreatic Oncology), Jian-Gao Fan (Chronic Liver Disease), Hou-Bao Liu (Biliary Tract Disease)

EDITORIAL BOARD MEMBERS
http://www.wjgnet.com/1007-9327/editorialboard.htm

PUBLICATION DATE
June 21, 2024

COPYRIGHT
© 2024 Baishideng Publishing Group Inc

PUBLISHING PARTNER
Shanghai Pancreatic Cancer Institute and Pancreatic Cancer Institute, Fudan University
Biliary Tract Disease Institute, Fudan University

INSTRUCTIONS TO AUTHORS
https://www.wjgnet.com/bpg/gerinfo/204

GUIDELINES FOR ETHICS DOCUMENTS
https://www.wjgnet.com/bpg/gerinfo/287

GUIDELINES FOR NON-NATIVE SPEAKERS OF ENGLISH
https://www.wjgnet.com/bpg/gerinfo/240

PUBLICATION ETHICS
https://www.wjgnet.com/bpg/gerinfo/288

PUBLICATION MISCONDUCT
https://www.wjgnet.com/bpg/gerinfo/208

POLICY OF CO-AUTHORS
https://www.wjgnet.com/bpg/gerinfo/310

ARTICLE PROCESSING CHARGE
https://www.wjgnet.com/bpg/gerinfo/242

STEPS FOR SUBMITTING MANUSCRIPTS
https://www.wjgnet.com/bpg/gerinfo/239

ONLINE SUBMISSION
https://www.topublishing.com

PUBLISHING PARTNER’S OFFICIAL WEBSITE
https://www.shca.org.cn
https://www.zs-hospital.sh.cn
Advancing hepatic recompensation: Baveno VII criteria and therapeutic innovations in liver cirrhosis management

Lorenzo Ridola, Sara Del Cioppo

Abstract

The Baveno VII criteria redefine the management of decompensated liver cirrhosis, introducing the concept of hepatic recompensation marking a significant departure from the conventional view of irreversible decline. Central to this concept is addressing the underlying cause of cirrhosis through tailored therapies, including antivirals and lifestyle modifications. Studies on alcohol, hepatitis C virus, and hepatitis B virus-related cirrhosis demonstrate the efficacy of these interventions in improving liver function and patient outcomes. Transjugular intrahepatic portosystemic shunt (TIPS) emerges as a promising intervention, effectively resolving complications of portal hypertension and facilitating recompensation. However, optimal timing and patient selection for TIPS remain unresolved. Despite challenges, TIPS offers renewed hope for hepatic recompensation, marking a significant advancement in cirrhosis management. Further research is needed to refine its implementation and maximize its benefits. In conclusion, TIPS stands as a promising avenue for improving hepatic function and patient outcomes in decompensated liver cirrhosis within the framework of the Baveno VII criteria.

Key Words: Hepatic recompensation; Baveno VII; Transjugular intrahepatic portosystemic shunt; Portal hypertension; Cirrhosis; Decompensation

©The Author(s) 2024. Published by Baishideng Publishing Group Inc. All rights reserved.
INTRODUCTION

The concept of hepatic recompensation, as outlined by the Baveno VII criteria, represents a significant advancement in the management of decompensated liver cirrhosis. Traditionally, decompensation has been viewed as a point of no return in the progression of liver disease. However, the Baveno VII guidelines propose a new paradigm by delineating specific criteria for hepatic recompensation, offering renewed hope for patients previously deemed ineligible for therapeutic intervention.

At the core of the Baveno VII concept of hepatic recompensation is the idea of addressing the underlying cause of cirrhosis. Whether through removal, suppression, or cure, targeting the primary etiology is essential to initiate the process of recompensation. Therapeutic modalities vary and are tailored to the specific etiology, including antiviral therapy for viral hepatitis, lifestyle modifications for alcohol-related liver disease or metabolic-associated fatty liver disease, or other targeted interventions as appropriate.

According to Baveno VII, liver recompensation is defined as the removal of the etiological factor of liver cirrhosis, resolution of ascites, hepatic encephalopathy, and absence of recurrent variceal hemorrhage for at least 12 months, along with stable improvement in liver function[1].

Regarding the alcoholic etiology, several studies have been conducted, such as that of Hofer et al[2], a retrospective study on 204 patients with alcohol-related liver cirrhosis, which analyzed the effect of alcohol abstinence on hepatic compensation. This research, based on the concept of hepatic compensation according to Baveno VII and through the measurement of hepatic venous pressure gradient, revealed that 18.1% of patients achieved compensation with a mean follow-up of 24 months. However, this compensation does not alter the risk of developing hepatocellular carcinoma, making adherence to screening programs still necessary. The study by Pose et al[3], a multicenter retrospective study conducted on 1001 liver transplant-listed patients for alcohol-related liver cirrhosis, hepatitis C virus (HCV)-related, and non-alcoholic steatohepatitis-related cirrhosis, indicated that 8.7% were removed from the list due to improvement after a median follow-up of 29 months. The difference in results between the two aforementioned studies depends on both the different reference patient cohorts, which in the case of the Pose et al[3] study is more selected, and on the diversity of the criteria chosen to define hepatic compensation, which only in the Hofer et al[2] study faithfully follows the Baveno VII criteria.

Regarding HCV-related cirrhosis, the study by El-Sherif et al[4] is a retrospective analysis of four clinical trials on the effects of direct-acting antiviral (DAV) therapy in patients with decompensated HCV-related liver cirrhosis. The primary outcome was improvement in liver function, defined as transition to Child-Pugh class A. Overall, 31.6% of Child-Pugh B patients and 12.3% of Child-Pugh C patients who achieved sustained virological response (VR) after DAA therapy reverted to Child-Pugh class A. The study by Gentile et al[5] is a multicenter prospective study involving 89 patients with Child-Pugh class B liver cirrhosis who received DAA therapy. Sustained VR (SVR) was achieved in 95.5% of patients; 61.8% of patients transitioned to Child-Pugh class A, 33.7% remained with Child-Pugh class B, and 4.5% worsened to Child-Pugh class C. This study demonstrated that DAA therapy is safe and has a high rate of SVR and hepatic compensation. However, further research is needed to fully understand the long-term effects and impact on patient survival.

Regarding hepatitis B virus (HBV)-related liver cirrhosis, in cases of previous decompensation, therapy is based on nucleoside/nucleotide analogs that reduce circulating levels of HBV-DNA to undetectable levels in 80% of patients within a year[6-8]. The study by Jang et al[9] is a prospective, multicenter study involving 707 patients who experienced their first episode of decompensation. The primary endpoint of the study was 5-year liver transplantation-free survival, while the secondary endpoint was VR, serological response, and improvement in liver function. Patients treated with antivirals showed significantly better survival without transplantation compared to untreated patients. The study by Yao et al[10] recruited 23 patients with decompensated liver cirrhosis Child-Pugh B > 10 and treated them with Lamivudine. 60.9% of treated patients had a significant response, defined as a reduction in the Child-Pugh score of at least 3 points. Wang et al[11] were the first to validate the Baveno VII criteria for liver compensation in patients with HBV-related liver cirrhosis treated with entecavir. In this multicenter study, 320 patients were enrolled, treated with Entecavir for 120 weeks, and followed up for 6 months. 92.2% of the patients achieved a virological response with HBV DNA levels < 20 IU/mL, and 56.2% of the patients achieved liver compensation according to the Baveno VII criteria. These studies

Core Tip: The manuscript explores the concept of hepatic recompensation outlined in the Baveno VII criteria, challenging the traditional view of decompensated liver cirrhosis as irreversible. It emphasizes the importance of addressing the underlying cause of cirrhosis, tailoring therapy accordingly, and achieving specific criteria for recompensation. Studies on alcohol, hepatitis C virus and hepatitis B virus-related cirrhosis demonstrate how targeted interventions, including antiviral therapy and Transjugular intrahepatic portosystemic shunt (TIPS) procedures, promote hepatic compensation. While promising, optimal timing and therapy selection for TIPS remain unresolved. Nevertheless, TIPS emerges as a promising avenue for hepatic recompensation, offering renewed hope for patients previously deemed untreatable.

Citation: Ridola L, Del Cioppo S. Advancing hepatic recompensation: Baveno VII criteria and therapeutic innovations in liver cirrhosis management. World J Gastroenterol 2024; 30(23): 2954-2958
URL: https://www.wjgnet.com/1007-9327/full/v30/i23/2954.htm
DOI: https://dx.doi.org/10.3748/wjg.v30.i23.2954
demonstrate how antiviral therapy significantly modifies the natural history of decompensated cirrhosis, improving liver function and increasing survival.

All the studies mentioned so far indicate the importance of treating the underlying cause of cirrhosis to achieve liver compensation according to the criteria established by Baveno VII. In a specific subgroup of patients, an interventional radiology procedure can be added to improve the clinical outcome, which is transjugular intrahepatic portosystemic shunt (TIPS).

Traditionally, TIPS has been primarily indicated for specific complications of portal hypertension, such as acute variceal bleeding or refractory ascites. The rationale behind the use of TIPS lies in its ability to ameliorate the hemodynamic derangements characteristic of portal hypertension. By creating a shunt between the portal and systemic circulation, TIPS reduces portal pressure, thereby alleviating complications associated with portal hypertension (such as variceal bleeding and ascites), resolution of which is a prerequisite for hepatic recompensation according to the Baveno VII criteria. As a consequence, it can be suggested that TIPS may play a broader role in promoting hepatic recompensation according to the criteria outlined in Baveno VII.

The retrospective evaluation by Gao et al.[12] highlighted the potential role of TIPS in achieving hepatic recompensation in a subset of patients with bleeding varices or refractory ascites, with approximately one-third of these patients meeting the criteria for recompensation after TIPS placement, underscoring its therapeutic efficacy in selected cases. In this retrospective study, 64 patients were enrolled, considering inclusion criteria and exclusion criteria. TIPS placement was successful in 100% of cases, and no variceal bleeding occurred. The follow-up lasted for 12 months with patient reassessment at various intervals post-procedure. Several studies support the use of TIPS as a first-line treatment.

Regarding acute variceal bleeding, Liu et al.[13] conducted a retrospective study enrolling 50 patients with liver cirrhosis and portal pressure gradient values > 25 mmHg. They divided the patients into two groups: One (35 out of 50 patients) treated with TIPS as first-line therapy in secondary prophylaxis of esophageal variceal bleeding, and the other (15 out of 50 patients) treated with TIPS as second-line therapy. The aim was to assess differences in survival and portal hypertension-related complications between the groups. During follow-up, a statistically significant difference in survival was observed between the first line and second-line groups (94.3% vs 66.7%, log-rank P = 0.01), demonstrating the effectiveness of using TIPS as first-line therapy in improving survival.

Nicoară-Farcău et al.[14] conducted a meta-analysis of seven studies, including three randomized controlled trials and observational studies, comprising 1327 high-risk patients with liver cirrhosis and acute variceal bleeding (Child-Pugh B with active variceal bleeding or Child-Pugh C < 14). They compared the effects of preemptive TIPS, placed within 72 h of hospital admission for acute variceal bleeding, to endoscopy plus medical therapy with non-cardioselective beta-blockers. This meta-analysis clearly demonstrated beneficial effects in terms of survival, improved control of bleeding and ascites, and a lower rate of re-bleeding in this patient population.

Regarding the treatment of refractory ascites, Bureau et al.[15] conducted a prospective study on 62 patients with liver cirrhosis complicated by decompenated ascites, requiring at least two large-volume paracenteses within a three-week period. Patients were randomized into two groups: One treated with TIPS placement (29 patients) and the other treated with large-volume paracentesis plus albumin (33 patients). All patients followed a low-salt diet and were evaluated at 1 month, 3 months, and after 1 year through blood tests and assessment of Child-Pugh and MELD scores. Additionally, Doppler ultrasound was performed at 6 and 12 months. The primary endpoint of the study was one-year transplant-free survival. The study demonstrated that the TIPS-treated group met the primary endpoint in 93% of cases, compared to 52% in the large-volume paracentesis plus albumin group. The latter experienced portal hypertension-related bleeding in 18% of cases (18% vs 0%; P = 0.01) and hernia-related complications in 18% of cases (18% vs 0%; P = 0.01). Hospitalization duration was higher in the large-volume paracentesis plus albumin group compared to the TIPS group (35 d vs 17 d) (P = 0.04). In both groups, 65% of patients did not manifest hepatic encephalopathy in the first year. This study thus demonstrated the superiority of TIPS over large-volume paracentesis plus albumin in this patient population in terms of transplant-free survival and complications.

TIPS, however, is a technically complex procedure, with potentially fatal complications. These complications can be divided into intraprocedural, early, and late. Among the intraprocedural complications are those at the puncture site, during catheterization of the inferior vena cava or hepatic vein, during the puncture of the portal vein, hepatic artery injury, portal vein and/or mesenteric vein dissection. Early complications include hepatic encephalopathy, heart failure, bleeding, bile duct injury, STENT occlusion or migration. Late complications include TIPS dysfunction with persistence of signs of portal hypertension and endotipsitis. To reduce the rate of these complications and improve post-intervention survival, it is necessary to collaborate with a team of experts and perform adequate patient selection prior to the procedure. In this regard, the most commonly used score to predict outcome is the MELD score; for example, if MELD > 18 at time zero is associated with an unfavorable outcome. Therefore, especially with elective procedures, a careful evaluation of the patient is necessary, taking into consideration various factors that correlate with the outcome as patient age, baseline liver function using Child-Pugh score, renal function, patient nutritional status, and cognitive status.

**CONCLUSION**

In conclusion, TIPS represents a promising therapeutic option for achieving hepatic recompensation in patients with decompensated liver cirrhosis, as it can address both the hemodynamic consequences of portal hypertension and the underlying etiology of cirrhosis, thereby improving hepatic function in this patient population. However, the concept of hepatic recompensation is still evolving, and several issues remain unresolved, such as the optimal timing for TIPS placement and therapy selection. Therefore, further studies are needed to maximize efficacy while minimizing risks.
FOOTNOTES

Author contributions: Del Cioppo S was responsible for conceptualization and manuscript writing; Ridola L was responsible for conceptualization, manuscript writing, key revisions of important knowledge content, and final approval.

Conflict-of-interest statement: Lorenzo Ridola and Sara Del Cioppo have nothing to disclose.

Open-Access: This article is an open-access article that was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution NonCommercial (CC-BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: https://creativecommons.org/Licenses/by-nc/4.0/

Country of origin: Italy

ORCID number: Lorenzo Ridola 0000-0002-8596-2609.

S-Editor: Fan JR
L-Editor: A
P-Editor: Zheng XM

REFERENCES


