

Özgür ECEMİŞ¹ - Elif Tuğba TUNCEL²

DOI: 10.37609/akya.3785.c461

**KARIN AĞRISI OLAN
HASTANIN KONSÜLTASYON İLE
DEĞERLENDİRİLMESİ**

Karın ağrısı akut ya da kronik olabilir. Cerrahi, medikal ya da karın dışı organlara bağlı olabilir. Cerrahi patolojilerle ilişkili karın ağrıları sıklıkla akut karın ağrısı şeklindedir. Detaylı bir anamnez ve muayene bulguları önemlidir. Ağrının karakteri (akut? kronik?), ağrının tipi (viseral? paryetal? yansıyan?), ağrının lokalizasyonu, yayılımı, süresi, şiddeti, yemeklerle ilişkisi, artıran ve azaltan faktörler, fonksiyonel/organik ağrı? ve eşlik eden diğer faktörler sorgulanmalıdır. Öz-soygeçmiş, ilaçlar ve alarm semptomlar öğrenilmelidir.

Tanı için gerekli tetkikler: Hemogram, glukoz, elektrolitler, üre ve kreatinin, amilaz, lipaz, karaciğer fonksiyon testleri [alanin aminotransferaz (ALT), aspartat aminotransferaz (AST), gama-glutamil transferaz (GGT), alkalen fosfataz (ALP), bilirubin], D-dimer, insan koryonik gonadotropini (β -hCG), eritrosit sedimentasyon hızı (ESH), kan gazı, tam idrar tetkiki, gayta direkt bakışı ve gizli kan, kardiyak enzimler istenmelidir.

Radyolojik tetkikler: Akciğer grafisi, ayakta di-rek batın grafisi, elektrokardiyografi (EKG), batın ultrasonografisi ilk aşamada yapılmalıdır. Gere-

kirse bilgisayarlı tomografi (BT), manyetik rezonans görüntüleme (MRG), anjiyografi, endoskopi, kolonoskopi, tanısal laparoskopi/ laparotomi ileri tetkikler planlanmalıdır (1).

Karın Ağrısı Nedenleri (2)

- 1. Karın ağrısı yapan cerrahi patolojiler:** Akut apandisit, kolesistit, peptik ülser perforasyonu, akut mekanik barsak obstrüksiyonu, boğulmuş fıtık, intestinal perforasyonlar, mezenter arter ve ven tıkanıklığı, Meckel divertikülüti, nekrotizan pankreatit, anevrizma rüptürleri, dış gebelik rüptürü, over kist ve tümör torsiyonu, Boerhaave sendromu gibi nedenler akut karın ağrısı yaparlar.
- 2. Karın ağrısı yapan medikal patolojiler:** Akut gastrit, gastroenterit, akut hepatit, Budd-Chiari sendromu, biliyer kolik, renal kolik, üriner sistem enfeksiyonları, Ailesel Akdeniz Ateşi (FMF), Herpes zoster gibi nedenlerdir.
- 3. Karın dışı organlara bağlı karın ağrısı nedenleri ise;** Bazal pnömoni, plörezi, spontan pnömotoraks, myokard iskemisi, perikardit, kaburga kırıkları, testis torsiyonu'dur.
- 4. Kronik karın ağrısı nedenleri:** Kronik pankreatit, peptik ülser, gastroözofageal reflü hasta-

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kötüleştirebilir. Trombosit uyarıcı ajanlar trombosit sayısını artırabilir ancak trombotik olay riskini de artırabileceğinden dikkatli kullanılmalıdır (116). Anestezik ajan seçimi protein bağlanması, dağılımı ve ilaç metabolizması gibi değişkenlere dayanmaktadır. Sedasyon gerektiren prosedürler için propofol, benzodiazepinlere göre daha kısa sedasyon süresi ve sirotik hastalarda daha kısa derlenme süresine sahip olduğundan tercih edilir. Halojenli inhalasyon ajanları esas olarak solunum sistemi yoluyla atılır; lipofilik özelliklerinden dolayı bazıları emilir ve hepatik metabolizma gerektirir. Sevofluran ve desfluran gibi yeni ajanlar, halotana kıyasla daha az oranda hepatik metabolizmaya uğrarlar ve sirotik hastalarda daha güvenlidirler. Atrakuryum ve cis-atrakuryum, hepatik metabolizmaya uğramadıkları için uygun nöromusküler blokaj ajanlarıdır. Vekuronyum ve rokuronyum gibi diğer ajanlar karaciğer tarafından metabolize edilir ve etki süreleri uzamıştır (106). Karaciğerin ilaçları, özellikle de sitokrom P450 enzimleri yoluyla metabolize edilenleri uzaklaştırma kapasitesi bozulabileceğinden, analjeziklerin veya sedatiflerin doz aralığı artırılmalı ve/veya daha düşük bir doz verilmelidir. İlaçların doz aşımı kolaylıkla aşırı doz veya hepatik ensefalopati ile sonuçlanabilir. Karaciğer fonksiyon bozukluğu arttıkça ilaç metabolizmasındaki bozukluk da artar ve bu durum parasetamol gibi basit analjezikler, NSAİİ ve opioid analjezikler için geçerlidir. Fentanil opioid analjezik olarak kullanılması tercih edilir, çünkü hepatik olarak temizlenmesine rağmen aktif metaboliti yoktur. Ancak, birkaç gün boyunca kullanılırsa yağda birikebilir (113). Majör cerrahi geçiren karaciğer hastaları perioperatif dönemde önemli bir zorluk teşkil etmeye devam etmektedir. Ameliyat öncesi ayrıntılı değerlendirme ve optimizasyonun yanı sıra perioperatif dönemde dikkatli yönetim bu hasta grubunda mortalite ve morbiditenin iyileştirilmesi için hayati önem taşımaktadır. Skorlama sistemlerinin kullanımı prognostik değerlendirmeye yardımcı olabilir ve yoğun bakımın erken kullanımı düşünülmelidir (116).

KAYNAKLAR

1. Sandler RS, Stewart WF, Liberman JN, Ricci JA, Zorich NL. Abdominal pain, bloating, and diarrhea in the United States: prevalence and impact. *Dig Dis Sci* 2000; 45:1166-71.
2. Govender I, Rangiah S, Bongongo T, et al. A primary care approach to abdominal pain in adults. *S Afr Fam Pract*. 2021;63(1), a5280.
3. Barkun AN, Almadi M, Kuipers EJ, et al., Management of Nonvariceal Upper Gastrointestinal Bleeding: Guideline Recommendations From the International Consensus Group, *Ann Intern Med*. 2019; 171(11): 805–822.
4. Saleem S, Thomas AL. M anagement of Upper Gastrointestinal Bleeding by an Internist. *Cureus*. 2018 ;10(6): e2878.
5. Muguruma N, Kitamura S, Kimura T, et al. Endoscopic management of nonvariceal upper gastrointestinal bleeding: state of the art. *Clin Endosc*. 2015;48(2):96-101.
6. Frost J, Sheldon F, Kurup A, et al. An approach to acute lower gastrointestinal bleeding. *Frontline Gastroenterol*. 2017;8(3):174-182.
7. Shane AL, Mody RK, Crump JA, et al. 2017 Infectious Diseases Society of America Clinical Practice Guidelines for the Diagnosis and Management of Infectious Diarrhea. *Clin Infect Dis* 2017; 65: e45.
8. Riddle MS, DuPont HL, Connor BA. ACG Clinical Guideline: Diagnosis, Treatment, and Prevention of Acute Diarrheal Infections in Adults. *Am J Gastroenterol* 2016; 111:602.
9. Dutra B, Siddiqui S, Everett J. A Clinical Approach to Chronic Diarrhea. *Gastroenterology* 2022; 162:707.
10. Lembo A, Camilleri M. Chronic constipation. *N Engl J Med* 2003; 349:1360.
11. Chang L, Chey WD, Imdad A, et al. American Gastroenterological Association-American College of Gastroenterology Clinical Practice Guideline: Pharmacological Management of Chronic Idiopathic Constipation. *Am J Gastroenterol* 2023; 118:936.
12. Singh P, Yoon SS, Kuo B. Nausea: a review of pathophysiology and therapeutics. *Therap Adv Gastroenterol* 2016; 9:98.
13. American Gastroenterological Association. American Gastroenterological Association medical position statement: nausea and vomiting. *Gastroenterology* 2001; 120:261.
14. Sherwood P, Lyburn I, Brown S, et al. How are abnormal results for liver function tests dealt with in primary care? Audit of yield and impact. *BMJ*. 2001 Feb 3;322(7281):276-8.
15. Lilford RJ, Bentham L, Girling A, et al. Birmingham and Lambeth Liver Evaluation Testing Strategies (BALLETS): a prospective cohort study. *Health Technol Assess* 2013 Jul;17(28):i-xiv, 1-307. doi: 10.3310/hta17280.
16. Lee TH, Kim WR, Poterucha JJ. Evaluation of elevated liver enzymes. *Clin Liver Dis*. 2012 May;16(2):183-98. doi: 10.1016/j.cld.2012.03.006.
17. O'Brien CB. The hospitalized patient with abnormal liver function tests *Clin Liver Dis*. 2009 May;13(2):179-92. doi: 10.1016/j.cld.2009.02.010.

18. Schreiner AD, Rockey DC. Evaluation of abnormal liver tests in the adult asymptomatic patient. *Curr Opin Gastroenterol.* 2018 Jul;34(4):272-279. doi: 10.1097/MOG.0000000000000447.
19. Newsome PN, Cramb R, Davison SM et al. Guidelines on the management of abnormal liver blood tests. *Gut.* 2018 Jan;67(1):6-19. doi: 10.1136/gutjnl-2017-314924.
20. Sulava E, Bergin S, Long B, et al. Elevated Liver Enzymes: Emergency Department-Focused Management. *J Emerg Med.* 2017 May;52(5):654-667. doi: 10.1016/j.jemermed.2016.10.016.
21. Kalas MA, Chavez L, Leon M, et al. Abnormal liver enzymes: A review for clinicians. *World J Hepatol.* 2021 Nov 27;13(11):1688-1698. doi: 10.4254/wjh.v13.i11.1688.
22. Kwo PY, Cohen SM, Lim JK. ACG Clinical Guideline: Evaluation of Abnormal Liver Chemistries. *Am J Gastroenterol.* 2017 Jan;112(1):18-35. doi: 10.1038/ajg.2016.517.
23. Reichling JJ, Kaplan MM. Clinical use of serum enzymes in liver disease. *Dig Dis Sci.* 1988 Dec;33(12):1601-14. doi: 10.1007/BF01535953.
24. Reutemann B, Gordon FD. Evaluation of the Patient with Markedly Abnormal Liver Enzymes. *Clin Liver Dis.* 2023 Feb;27(1):1-16. doi: 10.1016/j.cld.2022.08.007.
25. Gopal DV, Rosen HR. Abnormal findings on liver function tests. Interpreting results to narrow the diagnosis and establish a prognosis. *Postgrad Med.* 2000 Feb;107(2):100-2, 105-9, 113-4. doi: 10.3810/pgm.2000.02.869.
26. Woreta TA, Alqahtani SA. Evaluation of abnormal liver tests. *Med Clin North Am.* 2014 Jan;98(1):1-16. doi: 10.1016/j.mcna.2013.09.005.
27. Méndez-Sánchez N, Qi X, Vitek L, et al. Evaluating an Outpatient With an Elevated Bilirubin. *Am J Gastroenterol.* 2019 Aug;114(8):1185-1188. doi: 10.14309/ajg.0000000000000336.
28. Fevery J. Bilirubin in clinical practice: a review. *Liver Int.* 2008 May;28(5):592-605. doi: 10.1111/j.1478-3231.2008.01716.x.
29. Peck-Radosavljevic M. Thrombocytopenia in chronic liver disease. *Liver Int.* 2017 Jun;37(6):778-793. doi: 10.1111/liv.13317. Epub 2016 Dec 27.
30. Arif-Tiwari H, Porter KK, Kamel IR, et al. ACR Appropriateness Criteria Abnormal Liver Function Tests. *J Am Coll Radiol.* 2023 Nov;20(11S) S302-S314. doi: 10.1016/j.jacr.2023.08.023.
31. Marrero JA, Ahn J, Reddy KR. ACG clinical guideline: the diagnosis and management of focal liver lesions. *Am J Gastroenterol.* 2014 Sep;109(9):1328-47; quiz 1348. doi: 10.1038/ajg.2014.213.
32. Kulkarni NM, Fung A, Kambadakone AR, et al. Computed Tomography Techniques, Protocols, Advancements, and Future Directions in Liver Diseases. *Magn Reson Imaging Clin N Am.* 2021 Aug;29(3):305-320.
33. Van Beers BE, Daire JL, Garteiser P. New imaging techniques for liver diseases. *J Hepatol.* 2015 Mar;62(3):690-700. doi: 10.1016/j.jhep.2014.10.014.
34. Yam BL, Siegelman ES. MR imaging of the biliary system. *Radiol Clin North Am.* 2014 Jul;52(4):725-55. doi: 10.1016/j.rcl.2014.02.011
35. Simons-Linares CR, Wander P, Vargo P, et al. Endoscopic ultrasonography: An inside view. *Cleve Clin J Med.* 2020 Mar;87(3):175-183. doi: 10.3949/ccjm87a.19003.
36. Kumar A, Mohanty NR, Mohanty M, et al. Comparison of MRCP and ERCP in the evaluation of common bile duct and pancreatic duct pathologies. *Front Med Technol.* 2023 Jul 12;5:946555. doi: 10.3389/fmedt.2023.946555
37. Ziessman HA. Hepatobiliary scintigraphy in 2014. *J Nucl Med Technol.* 2014 Dec;42(4):249-59. doi: 10.2967/jnumed.113.131490
38. D'Avila da Silva A, Zambam de Mattos A, Tovo CV. Nonalcoholic fatty liver disease: scintigraphy in the diagnosis of steatohepatitis. *Rev Assoc Med Bras (1992).* 2021 Nov;67(11):1665-1669. doi: 10.1590/1806-9282.20210718.
39. Al-Busafi SA, Ghali P, Wong P, et al. The utility of Xenon-133 liver scan in the diagnosis and management of nonalcoholic fatty liver disease. *Can J Gastroenterol.* 2012 Mar;26(3):155-9. doi: 10.1155/2012/796313.
40. Haug AR. Imaging of primary liver tumors with positron-emission tomography. *Q J Nucl Med Mol Imaging.* 2017 Sep;61(3):292-300. doi: 10.23736/S1824-4785.17.02994-6.
41. Grassetto G, Fornasiero A, Bonciarelli G. Additional value of FDG-PET/CT in management of "solitary" liver metastases: preliminary results of a prospective multicenter study. *Mol Imaging Biol.* 2010 Apr;12(2):139-44. doi: 10.1007/s11307-009-0249-5.
42. Tan GJ, Berlangieri SU, Lee ST, et al. FDG PET/CT in the liver: lesions mimicking malignancies. *Abdom Imaging.* 2014 Feb;39(1):187-95. doi: 10.1007/s00261-013-0043-3.
43. Keramida G, Peters AM. DG PET/CT of the non-malignant liver in an increasingly obese world population. *Clin Physiol Funct Imaging.* 2020 Sep;40(5):304-319. doi: 10.1111/cpf.12651.
44. Williams AL, Hoofnagle JH. Ratio of serum aspartate to alanine aminotransferase in chronic hepatitis. Relationship to cirrhosis. *Gastroenterology.* 1988 Sep;95(3):734-9. doi: 10.1016/s0016-5085(88)80022-2.
45. Giannini EG, Testa R, Savarino V. Liver enzyme alteration: a guide for clinicians. *CMAJ.* 2005 Feb 1;172(3):367-79. doi: 10.1503/cmaj.1040752.
46. Sheka AC, Adeyi O, Thompson J, et al. Nonalcoholic Steatohepatitis: A Review. *JAMA.* 2020 Mar 24;323(12):1175-1183. doi: 10.1001/jama.2020.2298.
47. Estes C, Anstee QM, Arias-Loste MT, et al. Modeling NAFLD disease burden in China, France, Germany, Italy, Japan, Spain, United Kingdom, and United States for the period 2016-2030. *J Hepatol.* 2018 Oct;69(4):896-904. doi: 10.1016/j.jhep.2018.05.036.
48. Amernia B, Moosavy SH, Banookh F, et al. FIB-4, APRI, and AST/ALT ratio compared to FibroScan for the assessment of hepatic fibrosis in patients with non-alcoholic fatty liver disease in Bandar Abbas, Iran. *BMC Gastroenterol.* 2021 Dec 3;21(1):453. doi: 10.1186/s12876-021-02038-3.
49. Singal AK, Bataller R, Ahn J, et al. ACG Clinical Guideline: Alcoholic Liver Disease. *Am J Gastroenterol.* 2018 Feb;113(2):175-194. doi: 10.1038/ajg.2017.469.

50. Anciaux ML, Pelletier G, Attali P. Prospective study of clinical and biochemical features of symptomatic chole-docholithiasis. *Dig Dis Sci*. 1986 May;31(5):449-53. doi: 10.1007/BF01320306.
51. Chang CW, Chang WH, Lin CC. Acute transient hepato-cellular injury in cholelithiasis and cholecystitis without evidence of choledocholithiasis. *World J Gastroenterol*. 2009 Aug 14;15(30):3788-92. doi: 10.3748/wjg.15.3788.
52. Zgheib H, Wakil C, Shayya S. Utility of liver function tests in acute cholecystitis. *Ann Hepatobiliary Panc-reat Surg*. 2019 Aug;23(3):219-227. doi: 10.14701/ah-bps.2019.23.3.219.
53. Buxbaum JL, Abbas Fehmi SM, Sultan S, et al. ASGE guideline on the role of endoscopy in the evaluation and management of choledocholithiasis. *Gastrointest Endosc*. 2019 Jun;89(6):1075-1105.e15. doi: 10.1016/j.gie.2018.10.001. Epub 2019 Apr 9.
54. Fontana RJ, Liou I, Reuben A, et al. AASLD practice guidance on drug, herbal, and dietary supplement-induced liver injury. *Hepatology*. 2023 Mar 1;77(3):1036-1065. doi: 10.1002/hep.32689. Epub 2023 Feb 17.
55. Andrade RJ, Aithal GP, Björnsson ES, et al. EASL Clinical Practice Guidelines: Drug-induced liver injury. *J Hepatol*. 2019 Jun;70(6):1222-1261. doi: 10.1016/j.jhep.2019.02.014. Epub 2019 Mar 27.
56. Andrade RJ, Camargo R, Lucena MI, et al. Causality assessment in drug-induced hepatotoxicity. *Expert Opin Drug Saf*. 2004 Jul;3(4):329-44. doi: 10.1517/14740338.3.4.329.
57. Foureau DM, Walling TL, Maddukuri V, et al. Comparative analysis of portal hepatic infiltrating leucocytes in acute drug-induced liver injury, idiopathic autoimmune and viral hepatitis. *Clin Exp Immunol*. 2015 Apr;180(1):40-51. doi: 10.1111/cei.12558.
58. Tapper EB, Sengupta N, Bonder A. The Incidence and Outcomes of Ischemic Hepatitis: A Systematic Review with Meta-analysis. *Am J Med*. 2015 Dec;128(12):1314-21. doi: 10.1016/j.amjmed.2015.07.033.
59. Seeto RK, Fenn B, Rockey DC. Ischemic hepatitis: clinical presentation and pathogenesis. *Am J Med*. 2000 Aug 1;109(2):109-13. doi: 10.1016/s0002-9343(00)00461-7.
60. Muratori L, Lohse AW, Lenzi M. Diagnosis and management of autoimmune hepatitis. *BMJ*. 2023 Feb 6;380:e070201. doi: 10.1136/bmj-2022-070201.
61. European Association for the Study of the Liver. EASL Clinical Practice Guidelines on haemochromatosis. *J Hepatol*. 2022 Aug;77(2):479-502. doi: 10.1016/j.jhep.2022.03.033.
62. Barbosa JV, Fraga M, Saldarriaga J, et al. Hepatic manifestations of Wilson's disease: 12-year experience in a Swiss tertiary referral centre. *Swiss Med Wkly*. 2018 Dec 21;148:w14699. doi: 10.4414/sm.w.2018.14699.
63. Korman JD, Vollenberg I, Balko J, et al. Screening for Wilson disease in acute liver failure: a comparison of currently available diagnostic tests. *Hepatology*. 2008 Oct;48(4):1167-74. doi: 10.1002/hep.22446.
64. Schilsky ML, Roberts EA, Bronstein JM, et al. A multidisciplinary approach to the diagnosis and management of Wilson disease: Executive summary of the 2022 Practice Guidance on Wilson disease from the American Association for the Study of Liver Diseases. *Hepatology*. 2023 Apr 1;77(4):1428-1455. doi: 10.1002/hep.32805. Epub 2022 Dec 7.
65. Teckman JH, Mangalat N. Alpha-1 antitrypsin and liver disease: mechanisms of injury and novel interventions. *Expert Rev Gastroenterol Hepatol*. 2015 Feb;9(2):261-8.
66. Strnad P, McElvaney NG, Lomas DA. Alpha1-Antitrypsin Deficiency. *N Engl J Med*. 2020 Apr 9;382(15):1443-1455. doi: 10.1056/NEJMra1910234.
67. Stravitz RT, Fontana RJ, Karvellas C, et al. Future directions in acute liver failure. *Hepatology*. 2023 Oct 1;78(4):1266-1289. doi: 10.1097/HEP.0000000000000458.
68. O'Grady JG, Alexander GJ, Hayllar KM, et al. Early indicators of prognosis in fulminant hepatic failure. *Gastroenterology*. 1989 Aug;97(2):439-45. doi: 10.1016/0016-5085(89)90081-4.
69. Child CG, Turcotte JG. Surgery and portal hypertension. *Major Probl Clin Surg*. 1964;1:1-85.
70. Malinchoc M, Kamath PS, Gordon FD, et al. A model to predict poor survival in patients undergoing transjugular intrahepatic portosystemic shunts. *Hepatology*. 2000 Apr;31(4):864-71. doi: 10.1053/he.2000.5852.
71. Kremers WK, Ijperen MV, Kim WR. MELD score as a predictor of pretransplant and posttransplant survival in OPTN/UNOS status 1 patients. *Hepatology*. 2004 Mar;39(3):764-9. doi: 10.1002/hep.20083.
72. Improvements to MELD, PELD, Status 1A and Status 1B to take effect July 13. United Network for Organ Sharing, 2023. Available at: <https://unos.org/news/improvements-to-meld-and-peld-phase-1-data-entry-in-effect-june-15/>
73. Jakab SS1, Garcia-Tsao G. Evaluation and Management of Esophageal and Gastric Varices in Patients with Cirrhosis. *Clin Liver Dis*. 2020 Aug;24(3):335-350. doi: 10.1016/j.cld.2020.04.011
74. Abraldes JG, Bureau C, Stefanescu H, et al. Noninvasive tools and risk of clinically significant portal hypertension and varices in compensated cirrhosis: The "Anticipate" study. *Hepatology*. 2016 Dec;64(6):2173-2184. doi: 10.1002/hep.28824.
75. Garcia-Tsao G, Abraldes JG, Berzigotti A, et al. Portal hypertensive bleeding in cirrhosis: Risk stratification, diagnosis, and management: 2016 practice guidance by the American Association for the study of liver diseases. *Hepatology*. 2017 Jan;65(1):310-335. doi: 10.1002/hep.28906.
76. Singal AG, Zhang E, Narasimman M, et al. HCC surveillance improves early detection, curative treatment receipt, and survival in patients with cirrhosis: A meta-analysis. *J Hepatol*. 2022 Jul;77(1):128-139. doi: 10.1016/j.jhep.2022.01.023.
77. Katarey D, Westbrook RH. Pregnancy-specific liver diseases. *Best Pract Res Clin Obstet Gynaecol*. 2020 Oct; 68:12-22.
78. Goodwin TM. Hyperemesis gravidarum. *Obstet Gynecol Clin North Am*. 2008 Sep;35(3):401-17, viii. doi: 10.1016/j.ogc.2008.04.002.
79. European Association for the Study of the Liver. EASL Clinical Practice Guidelines on the management of liver diseases in pregnancy. *J Hepatol*. 2023 Sep;79(3):768-828. doi: 10.1016/j.jhep.2023.03.006
80. McParlin C, O'Donnell A, Robson SC, et al. Treatments

- for Hyperemesis Gravidarum and Nausea and Vomiting in Pregnancy: A Systematic Review. *JAMA*. 2016 Oct 4;316(13):1392-1401. doi: 10.1001/jama.2016.14337.
81. Boelig RC, Barton AJ, Saccone G, et al. Interventions for treating hyperemesis gravidarum: a Cochrane systematic review and meta-analysis. *J Matern Fetal Neonatal Med*. 2018 Sep;31(18):2492-2505.
 82. Porgador O, Sheiner E, Pariente G, et al. Pregnancy outcomes by hyperemesis gravidarum severity and time of diagnosis: A retrospective cohort study. *Int J Gynaecol Obstet*. 2024 Jun 28. doi: 10.1002/ijgo.15760.
 83. Ozkan S, Ceylan Y, Ozkan VO, et al. Review of a challenging clinical issue: Intrahepatic cholestasis of pregnancy. *World J Gastroenterol*. 2015 Jun 21;21(23):7134-41. doi: 10.3748/wjg.v21.i23.7134.
 84. Ovadia C, Seed PT, Sklavounos A, et al. Association of adverse perinatal outcomes of intrahepatic cholestasis of pregnancy with biochemical markers: results of aggregate and individual patient data meta-analyses. *Lancet*. 2019 Mar 2;393(10174):899-909. doi: 10.1016/S0140-6736(18)31877-4.
 85. Chappell LC, Bell JL, Smith A, et al. Ursodeoxycholic acid versus placebo in women with intrahepatic cholestasis of pregnancy (PITCHES): a randomised controlled trial. *Lancet*. 2019 Sep 7;394(10201):849-860. doi: 10.1016/S0140-6736(19)31270-X.
 86. Ovadia C, Sajous J, Seed PT, et al. Ursodeoxycholic acid in intrahepatic cholestasis of pregnancy: a systematic review and individual participant data meta-analysis. *Lancet Gastroenterol Hepatol*. 2021 Jul;6(7):547-558. doi: 10.1016/S2468-1253(21)00074-1.
 87. Weinstein L. Syndrome of hemolysis, elevated liver enzymes, and low platelet count: a severe consequence of hypertension in pregnancy. *Am J Obstet Gynecol*. 1982 DOI: 10.1016/s0002-9378(16)32330-4
 88. Haram K, Svendsen E, Abildgaard U. The HELLP syndrome: clinical issues and management. A Review. *BMC Pregnancy Childbirth*. 2009 Feb 26;9:8. doi: 10.1186/1471-2393-9-8.
 89. Committee on Practice Bulletins—Obstetrics. Gestational Hypertension and Preeclampsia: ACOG Practice Bulletin, Number 222. *Obstet Gynecol*. 2020 Jun;135(6):e237-e260. doi: 10.1097/AOG.0000000000003891.
 90. Salmuth VV, Heiden YVD, Bekkers I. The role of hepatic sinusoidal obstruction in the pathogenesis of the hepatic involvement in HELLP syndrome: Exploring the literature. *Pregnancy Hypertens*. 2020 Jan; 19:37-43. doi: 10.1016/j.preghy.2019.11.012.
 91. Terrault NA, Williamson C. Pregnancy-Associated Liver Diseases. *Gastroenterology*. 2022 Jul;163(1):97-117.e1. doi: 10.1053/j.gastro.2022.01.060.
 92. Sun WJ, Hu J, Zhang Q2, et al. Administration of corticosteroid therapy for HELLP syndrome in pregnant women: evidences from seven randomized controlled trials. *Hypertens Pregnancy*. 2023 Dec;42(1):2276726.
 93. Acute Fatty Liver Disease of Pregnancy: Updates in Pathogenesis, Diagnosis, and Management. *Am J Gastroenterol*. 2017 Jun;112(6):838-846. doi: 10.1038/ajg.2017.54.
 94. Ch'ng CL, Morgan M, Hainsworth I, et al. Prospective study of liver dysfunction in pregnancy in South Wales. *Gut*. 2002 Dec;51(6):876-80. doi: 10.1136/gut.51.6.876.
 95. Azzopardi E, Lloyd C, Teixeira SR, et al. Clinical applications of amylase: Novel perspectives. *Surgery*. 2016 Jul;160(1):26-37. doi: 10.1016/j.surg.2016.01.005.
 96. Ismail OZ, Bhayana V. Lipase or amylase for the diagnosis of acute pancreatitis? *Clin Biochem*. 2017 Dec;50(18):1275-1280. doi: 10.1016/j.clinbiochem.2017.07.003.
 97. Treacy J, Williams A, Bais R. Evaluation of amylase and lipase in the diagnosis of acute pancreatitis. *ANZ J Surg*. 2001 Oct;71(10):577-82. doi: 10.1046/j.1445-2197.2001.02220.x.
 98. Tenner S, Vege SS, Sheth SG, et al. American College of Gastroenterology Guidelines: Management of Acute Pancreatitis. *Am J Gastroenterol*. 2024 Mar 1;119(3):419-437. doi: 10.14309/ajg.0000000000002645.
 99. Yadav D, Agarwal N, Pitchumoni CS. A critical evaluation of laboratory tests in acute pancreatitis. *Am J Gastroenterol*. 2002 Jun;97(6):1309-18. doi: 10.1111/j.1572-0241.2002.05766.x.
 100. Sutton PA, Humes DJ, Purcell G, et al. The role of routine assays of serum amylase and lipase for the diagnosis of acute abdominal pain. *Ann R Coll Surg Engl*. 2009 Jul;91(5):381-4. doi: 10.1308/003588409X392135.
 101. Muniraj T, Dang S, Pitchumoni CS. PANCREATITIS OR NOT?-Elevated lipase and amylase in ICU patients. *J Crit Care*. 2015 Dec;30(6):1370-5. doi: 10.1016/j.jcrc.2015.08.020.
 102. Lawson GJ. Prevalence of macroamylasaemia using polyethylene glycol precipitation as a screening method. *Ann Clin Biochem*. 2001 Jan;38(Pt 1):37-45. doi: 10.1258/0004563011900263.
 103. Gullo L. Familial pancreatic hyperenzymemia. *Pancreas*. 2000 Mar;20(2):158-60. doi: 10.1097/00006676-200003000-00008.
 104. Choi SJ. A Systematic Approach to Patients with Elevated Levels of Serum Amylase or Lipase Korean *J Gastroenterol*. 2023 May 25;81(5):189-196. doi: 10.4166/kjg.2023.043.
 105. Frye JW, Perri RE. Perioperative risk assessment for patients with cirrhosis and liver disease. *Expert Rev Gastroenterol Hepatol*. 2009 Feb;3(1):65-75. doi: 10.1586/17474124.3.1.65.
 106. Starczewska MH, Mon W, Shirley P. Anaesthesia in patients with liver disease. *Curr Opin Anaesthesiol*. 2017 Jun;30(3):392-398. doi: 10.1097/ACO.0000000000000470.
 107. Patel T. Surgery in the patient with liver disease. *Mayo Clin Proc*. 1999 Jun;74(6):593-9. doi: 10.4065/74.6.593.
 108. Muilenburg DJ, Singh A, Torzilli G, et al. Surgery in the patient with liver disease. *Med Clin North Am*. 2009 Sep;93(5):1065-81. doi: 10.1016/j.mcna.2009.05.008.
 109. Farnsworth N, Fagan SP, Berger DH, et al. Child-Turcotte-Pugh versus MELD score as a predictor of outcome after elective and emergent surgery in cirrhotic patients. *Am J Surg*. 2004 Nov;188(5):580-3. doi: 10.1016/j.amjsurg.2004.07.034.
 110. Ziser A, Plevak DJ, Wiesner RH, et al. Morbidity and mortality in cirrhotic patients undergoing anesthesia and surgery. *Anesthesiology*. 1999 Jan;90(1):42-53. doi: 10.1097/00000542-199901000-00008.

111. Muir AJ. Surgical clearance for the patient with chronic liver disease. *Clin Liver Dis.* 2012 May;16(2):421-33. doi: 10.1016/j.cld.2012.03.008.
112. Nicoll A. Surgical risk in patients with cirrhosis. *J Gastroenterol Hepatol.* 2012 Oct;27(10):1569-75. doi: 10.1111/j.1440-1746.2012.07205.x.
113. Kaltenbach MG, Mahmud N. Assessing the risk of surgery in patients with cirrhosis. *Hepatol Commun.* 2023 Mar 30;7(4): e0086. doi: 10.1097/HC9.0000000000000086.
114. Weeder PD, Porte RJ, Lisman T. Hemostasis in liver disease: implications of new concepts for perioperative management. *Transfus Med Rev.* 2014 Jul;28(3):107-13. doi: 10.1016/j.tmr.2014.03.002.
115. Newman KL, Johnson KM, Cornia PB, et al. Perioperative Evaluation and Management of Patients With Cirrhosis: Risk Assessment, Surgical Outcomes, and Future Directions. *Clin Gastroenterol Hepatol.* 2020 Oct;18(11):2398-2414.e3. doi: 10.1016/j.cgh.2019.07.051.
116. Lopez-Delgado JC, Ballus J, Esteve F et al. Outcomes of abdominal surgery in patients with liver cirrhosis. *World J Gastroenterol.* 2016 Mar 7;22(9):2657-67. doi: 10.3748/wjg.v22.i9.2657.