



BÖLÜM 23

TRAVMALI HASTADA ANESTEZİ

Tayfun ET¹

GİRİŞ

Travma, hayatın günlük akışında beklenmeyen bir anda gelişen, bireyin psikolojik ve fizyolojik bütünlüğünü tehdit eden olaylar olarak tanımlanabilir. Artan teknolojik gelişmeler ve endüstriyel alanda hızlı ilerlemeler sonucu en önemli ölüm nedenleri arasında sayılmaktadır. Genç bireylerde özellikle travma sonucu sakatlanma sayısında ve ölüm oranında önemli bir artış görülmektedir. Travma, kanser ve kardiyovasküler hastalıklardan sonra üçüncü sırada ölüm nedeni olarak yer almaktadır. 0-40 yaş grubunda ise travma nedeniyle ölüm 1. sıradadır ve bunun ilk nedenini trafik kazaları oluşturmaktadır. Travmada en büyük morbidite ve mortalite kaynağı hemorajik şoktur. Yalnızca Amerika Birleşik Devletleri’nde, travma-yı takiben yılda yaklaşık 60. 000 hasta hemorajik

şoktan ölmektedir. Hemorajik şok ilk 24 saatte ölümlerin %30 ila %40’ını oluşturmaktadır. Dünya genelinde yılda yaklaşık 2 milyon kişi travma nedeniyle hayatını kaybetmektedir (1, 2).

Travma lokalizasyonu göre lokal-multiple, yaralama şekline göre künt-penetrant, durumun ciddiyetine göre hafif-orta-ciddi şeklinde sınıflandırılabilir. Vücudun iki veya daha fazla bölgesinin travmaya bağlı kalmasına multi-travma denir. Travma bölgesine göre, kafa, göz, vertebra, pelvis, toraks, abdominal ve üriner bölge, ekstremiteler travmaları şeklinde de sınıflandırılabilir.

Travma; özel ve titiz yaklaşımlar gerektiren, en önemli ölüm nedenleri arasında acil tıbbi durum sayılmaktadır. Travma sonrası cerrahi girişimlerde hayat kurtarıcı rolü yanında, sağ kalımı artırmak için profesyonel bir anestezi yönetimine ihtiyaç vardır.

¹ Dr. Öğr. Üyesi, Karaman Eğitim ve Araştırma Hastanesi, Anesteziyoloji ve Reanimasyon Kliniği, drtayfunet@gmail.com

çimi hastanın travma durumuna ve stabilizasyon durumuna göre değişmektedir. Preoperatif iyi değerlendirme ve gerekli hazırlıkların yapılması, intraoperatif hemodinamik olarak stabil tutma ve postoperatif bakımın uygun yapılması travma hastanda mortalite ve morbiditeyi düşmesini sağlayacaktır.

KAYNAKLAR

1. Lozano R, Naghavi M, Foreman K, et al. Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet* 2012;380:2095–128. doi: 10.1016/S0140-6736(12)61728-0
2. Kauvar DS, Lefering R, Wade CE. Impact of hemorrhage on trauma outcome: an overview of epidemiology, clinical presentations, and therapeutic considerations. *J Trauma* 2006;60:3–11. doi: 10.1097/01.ta.0000199961.02677.19.
3. American College of Surgeons' Committee on Trauma. Advanced trauma life support. 10th edition. Chicago: American College of Surgeons; 2018
4. Morgan EG, Mikhail MS, Murray MJ, et al. çeviri editörleri. Klinik Anesteziyoloji. Ankara: Güneş Kitabevi Ltd. Şti; 2004.
5. Sikorski RA, Ken Koerner AK, Weber LYF, et al. Choice of General Anesthetics for Trauma Pati-ents. *Curr Anesthesiol Rep* 2014;4:225–32.
6. Higgs A, McGrath BA, Goddard C, et al. Guidelines for the management of tracheal intubation in critically ill adults. *Br J Anaesth.* 2018 Feb;120 (2):323–352. doi: 10.1016/j.bja.2017.10.021.
7. Grande CM, Stene JK, Bernhard WN. Airway management: considerations in the trauma patient. *Crit Care Clin.* 1990;6:37–59.
8. Stone HH, Strom PR, Mullins RJ. Management of the major coagulopathy with onset during laparotomy. *Ann Surg* 1983;197:532–5. doi: 10.1097/00000658-198305000-00005.
9. Cavaliere F, Iacobone E, Gorgoglione M, et al. Anesthesiologic preoperative evaluation of drug addicted patient.. *Minerva Anestesiol.* 2005;71:367–71.
10. Piseagna JR, Martindale RG. Acid suppression in the perioperative period. *J Clin Gastroenterol.* 2005;39:10–6.
11. Kao CH, ChangLai SP, Chieng PU, et al. Gastric emptying in head-injured patients. *Am J Gastroenterol* 1998;93:1108–12. doi: 10.1111/j.1572-0241.1998.00338.x
12. Browning KN, Travagli RA. Central nervous system control of gastrointestinal motility and secretion and modulation of gastrointestinal functions. *Compr Physiol* 2014;4:1339–68. doi: 10.1002/cphy.c130055
13. Marik PE. Propofol: therapeutic indications and side-effects. *Curr Pharm Des.* 2004;10:3639–49. doi: 10.2174/1381612043382846.
14. Dewhirst E, Frazier WJ, Leder M, et al. Cardiac arrest following ketamine administration for rapid sequence intubation. *J Intensive Care Med* 2013;28:375–9. doi: 10.1177/0885066612448732
15. Cotton BA, Guillamondegui OD, Fleming SB, et al. Increased risk of adrenal insufficiency following etomidate exposure in critically injured patients. *Arch Surg* 2008;143:62–7. doi: 10.1001/archsurg.143.1.62
16. Zed PJ, Abu-Laban RB, Harrison DW. Intubating conditions and hemodynamic effects of etomidate for rapid sequence intubation in the emergency department: an observational cohort study. *Acad Emerg Med* 2006;13:378–83. doi: 10.1197/j.aem.2005.11.076
17. Lipiner-Friedman D, Sprung CL, Laterre PF, et al. Adrenal function in sepsis: the retrospective corticus cohort study. *Crit Care Med* 2007;35:1012–8. doi: 10.1097/01.CCM.0000259465.92018.6E.
18. Chan CM, Mitchell AL, Shorr AF. Etomidate is associated with mortality and adrenal insufficiency in sepsis: a meta-analysis. *Crit Care Med* 2012;40:2945–53. doi: 10.1097/CCM.0b013e31825fec26
19. Domino KB, Posner KL, Caplan RA, et al. Awareness during anesthesia: a closed claims analysis. *Anesthesiology* 1999;90:1053–61. doi: 10.1097/00000542-199904000-00019
20. Luxen J, Trentzsch H, Urban B. Rocuronium and su-gammadex in emergency medicine: requirements of a muscle relaxant for rapid sequence induction]. *B. Anaesthesist.* 2014;63:331–7. doi: 10.1007/s00101-014-2303-1
21. Reichele FM, Conzen PF. Halogenated inhalational anaesthetics. *Best Pract Res Clin Anaesthesiol.* 2003;17:29–46. doi: 10.1053/bean.2002.0265
22. Gadsden J, Warlick A. Anesthesia for the trauma patient: improving patient outcomes. *Local Reg Anesth.* 2015;12:8:45–55. doi: 10.2147/LRA.S55322.
23. Eroglu A, Uzunlar H, Erciyes N. Comparison of hypotensive epidural anesthesia and hypotensive total intravenous anesthesia on intraoperative blood loss during total hip replacement. *J Clin Anesth.* 2005;17:420–5. doi: 10.1016/j.jclinane.2004.09.006
24. Brueckner S, Reinke U, Roth-Isigkeit A, et al. Comparison of general and spinal anesthesia and their influence on hemostatic markers in patients undergoing total hip arthroplasty. *Clinical Trial J Clin Anesth.* 2003;15:433–40. doi: 10.1016/s0952-8180(03)00082-5
25. Hardy JF, De Moerloose P, Samama M; Massive transfusion and coagulopathy: pathophysiology and implications for clinical management. *Can J Anaesth.* 2004;51:293–310. doi: 10.1007/BF03018233
26. Spahn DR, Bouillon B, Cerny V, et al. The European guideline on management of major bleeding and coagulo-

- pathy following trauma: fifth edition. *Crit Care.* 2019; 27:23:98. doi: 10. 1186/S13054-019-2347-3
- 27. Shafi S, Collinsworth AW, Richter KM, et al. Bundles of care for resuscitation from hemorrhagic shock and severe brain injury in trauma patients-Translating knowledge into practice. *J Trauma Acute Care Surg.* 2016;81:780–94. doi: 10. 1097/TA. 0000000000001161
 - 28. Galvagno S, Mackenzie C. New and future resuscitation fluids for trauma patients using hemoglobin and hypertonic saline. *Anesthesiol Clin.* 2013;31:1-19. doi: 10. 1016/j.anclin. 2012. 10. 004
 - 29. Jones DG, Nantais J, Rezende-Neto JB, et al. Crystalloid resuscitation in trauma patients: deleterious effect of 5L or more in the first 24h. *BMC Surg.* 2018. ;6:18:93. doi: 10. 1186/s12893-018-0427-y.
 - 30. Hardy JF, de Moerloose P, Samama CM. The coagulopathy of massive transfusion. *Vox Sang.* 2005;89:123–7. doi: 10. 1111/j. 1423-0410. 2005. 00678. x.
 - 31. Lira A, Pinsky M. Choices in fluid type and volume during resuscitation: impact on patient outcomes. *Ann Intensive Care.* 2014;4:38. doi: 10. 1186/s13613-014-0038-4. eCollection 2014.
 - 32. Annane D, Siami S, Jaber S, et al. Effects of fluid resuscitation with colloids vs crystalloids on mortality in critically ill patients presenting with hypovolaemic shock. The CRISTAL randomized trial. *JAMA.* 2013;310:1809–181. doi: 10. 1001/jama. 2013. 280502.
 - 33. Brackney C, Diaz L, Milbrandt E, et al. Is albumin use SAFE in patients with traumatic brain injury? *Crit Care.* 2010;14:307. doi: 10. 1186/cc8940.
 - 34. Chappell D, Jacob M, Hofmann-Kiefer K, et al. A rational approach to perioperative fluid management. *Anesthesiology.* 2008;109:723–740. doi: 10. 1097/ALN. 0b013e3181863117.
 - 35. Spinella P, Perkin J, Grathwohl K et al. Warm fresh whole blood is independently associated with impro-
 - ved survival for patients with combat-related traumatic injuries. *J Trauma.* 2009; 66:69–76. doi: 10. 1097/TA. 0b013e31819d85fb.
 - 36. Raymer J, Flynn L, Martin R. Massive transfusion of blood in the surgical patient. *Surg Clin N Am.* 2012; 92:221–234. doi: 10. 1016/j.suc. 2012. 01. 008.
 - 37. Holcomb J, Tilley B, Baraniuk S et al. Transfusion of plasma, platelets and red blood cells in a 1:1:1 vs a 1:1:2 ratio and mortality in patients with severe trauma: the PROPPR randomised controlled trial. *JAMA.* 2015; 313:471–482. doi: 10. 1001/jama. 2015. 12.
 - 38. Spahn DR, Rossaint R. Coagulopathy and blood component transfusion in trauma. *Br J Anaesth.* 2005; 95:130–9. doi: 10. 1093/bja/aei169
 - 39. Sakai H, Takeoka S, Wettstein R, et al. Systemic and microvascular responses to hemorrhagic shock and resuscitation with Hb vesicles. *Am J Physiol Heart Circ Physiol.* 2002; 283:1191–9. doi: 10. 1152/ajpheart. 00080. 2002.
 - 40. Hildebrand F, Giannoudis PV, van Griensven M, et al. Pathophysiologic changes and effects of hypothermia on outcome in elective surgery and trauma patients. *Am J Surg.* 2004; 187:363–71. doi: 10. 1016/j.amjsurg. 2003. 12. 016.
 - 41. Dutton RP, Hess JR, Scalea TM. Recombinant factor VIIa for control of hemorrhage: early experience in critically ill trauma patients. *J Clin Anesth.* 2003;15:184–8. doi: 10. 1016/s0952-8180 (03)00034-5.
 - 42. Lynn M, Jeroukhimov I, Klein Y, et al. Updates in the management of severe coagulopathy in trauma patients. *Intensive Care Med.* 2002; 28: 241–7. doi: 10. 1007/s00134-002-1471-7.
 - 43. Theusinger OM, Levy JH. Point of care devices for assessing bleeding and coagulation in the trauma patient. *Anesthesiol Clin.* 2013;31: 55–65. doi: 10. 1016/j.anclin. 2012. 10. 006.