

COVID-19'LU HASTADA SIVI YÖNETİMİ

7. BÖLÜM

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GİRİŞ

Covid-19; 2019 ' un sonlarında Çin ' in Wuhan şehrinde görülmeye başlanmış olup dünya çapında birçok ülkede ciddi mortalite ve morbiditeye neden olmaya devam etmektedir. Bu virüs pnömoni, akut solunum yetmezliği sendromu(ARDS), aritmi, kardiyak disfonksiyon, karaciğer yetmezliği, renal yetmezlik ve mortaliteye neden olmaktadır ⁽¹⁾ .

Kişiden kişiye bulaşı önlemek için izolasyon sağlayarak teması azaltmak gerekmektedir. Birçok ülkede bu yayılan virüse karşı virüsün daha fazla yayılmasını önlemek amacıyla erken veya geç dönemde izolasyon yöntemleri alınmıştır.

Covid 19 virüsünü tanımak ve fizyolojisini anlamak takip ve tedavisinde önem arz etmektedir. COVID-19 enfeksiyonu bulguları hafif, orta ve ağır şiddette semptomlar görülebilmektedir. Gribal enfeksiyon gibi hafif semptomlar görülebildiği gibi akut solunum sıkıntısı sendromu (ARDS) gibi ciddi semptomlar da gelişebilmektedir. Ağır şiddette Covid-19 tanısı alan hastaların yoğun bakımda takibi gerekmektedir. Yoğun bakım sürecinde ağır pnömoni, ARDS, sepsis, septik şok, miyokardit, organ yetmezliği tabloları ile karşımıza çıkmaktadır. Bir çok tedavi stratejileri denenmesine rağmen aşı veya spesifik antiviral tedavisi bulunmamaktadır. Hastaların yönetiminde temel olarak viral yükün azaltılması ve organ yetmezlikleri düzelene kadar oksijenizasyon, ventilasyon ve sıvı yönetimi gibi destekleyici tedavi stratejileri kullanılmaktadır ⁽²⁾ . Yoğun bakımda kritik hastalarda sıvı tedavisi de bunlardan biridir. Covid- 19 tanısı, tedavisi ve yoğun bakım süreci kritik bakım gerektirmekle beraber bu süreçte ameliyathane odasından yoğun bakım takibine kadarki süreçte de sıvı tedavisi önem arz etmektedir.

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SONUÇ

Sıvı yönetiminde invaziv, minimal invaziv ve noninvaziv hemodinamik monitörizasyon yöntemleri bulunmakla beraber hangi monitörizasyon tekniğinin kullanılacağı hem kullanıcının tecrübesine hem de hastanın özelliklerine göre değişmektedir. Yoğun bakımdaki her hastanın ihtiyacı farklı olduğu için aşırı sıvı yükü oluşturmayacak kişiye özel gereksinimlerini karşılayacak sıvı hedeflenmelidir. Covid-19' lu hastanın yoğun bakım sürecinde takip ve tedavisi, tedavi sürecinde de gelişebilecek komplikasyon, organ yetmezliği gibi durumlar ciddi takip gerektirmektedir. Bu takip süresince yoğun bakımda mekanik ventilasyon ve Covid-19 tedavisine ek olarak günlük sıvı tedavisi de önemlidir. Bu süreçte amaç; hastalara yeterli kardiyak debi ve oksijenizasyonu sağlayacak ve akciğer ödemi azaltacak yeterli intravasküler volumü sağlamak olmalıdır.

KAYNAKÇA

1. C. Huang, Y. Wang, X. Li, L. Ren, J. Zhao, Y. Hu, et al., Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China, *Lancet* 395 (10223) (2020) 497–506.
2. Liu Y, Li J, Feng Y. Critical care response to a hospital outbreak of the 2019- nCoV infection in Shenzhen, China. *Crit Care*. 2020;24:56.
3. Chappell D, Westphal M, Jacob M. The impact of the glycocalyx on microcirculatory oxygen distribution in critical illness. *Current Opinion in Anaesth* 2009;22(2):155-62.
4. Kaye AD, Grogono AW. Fluid and electrolyte physiology. In: Miller RD, ed. *Anesthesia*. 5th ed. Philadelphia: Churchill Livingstone; 2000. p.1586-25.
5. Edwards MR, Grocott MPW. Perioperative Fluid and Electrolyte Therapy. *Miller 8th edition*, Chapter 59, Sayfa 1767- 1808. 2015.
6. Ertmer C, Kampmeier T, Rehberg S, Lange M. Fluid resuscitation in multiple trauma patients. *Current Opinion in Anesthesiology* 2011;24:202-8.
7. Booth C, Highley D. Crystalloids, colloids, blood, blood products and blood substitutes. *Anaesthesia and Intensive Care Medicine* 2010;2:50-5.
8. Yosunkaya A, Gök F. Yoğun Bakımda Hemodinamik Monitörizasyon. *Türkiye klinikleri J Anest Reanim-Special Topics* 2012;5:1-13.
9. Cannesson M. Arterial pressure variation and goal-directed fluid therapy. *J Cardiot-horac Vasc Anesth* 2010;24:487-97.
10. Morgan, G.E., M.S. Mikhail, and M.J. Murray, *Clinical anesthesiology*. 4th ed. 2006, New York: Lange Medical Books/McGraw Hill, Medical Pub. Division. xiv, 1105 p.
11. Santry HP, A.H., Fluid resuscitation: past, present and the future. *Current Opinion in Anesthesiology*, 2010. 24: p. 202-8.
12. Michard F, Teboul JL: Predicting fluid responsiveness in ICU patients. A critical analysis of the evidence. *Chest* 121: 2000 – 2008, 2002.
13. Booth C, H.D., Crystalloids, colloids, blood, blood products and blood substitutes. *Anaesthesia and Intensive Care Medicine*, 2010. 24: p. 50-55.
14. Dobrin, P.B.: vascular mechanics. In shephard, J.T., and Abboud, F.M.(eds.): *Handbook of physiology*. Sec.2, vol.3. Bethesda, American Physiological Soc. 1983: 65.

- 15 Pinsky MR: Assesment of indices of preload and volume responsiveness. *Curr Op Crit Care* 11: 235-239, 2009.
- 16 Joshi GP, Intraoperative fluid management. Section Editor: Avidan M. Deputy Editor: Nussmeier NA. Literature review current through: Sep 2015. This topic last updated: Apr 10, 2015.
- 17 Edwards MR, Grocott MPW. Perioperative Fluid and Electrolyte Therapy. Miller 8th edition, Chapter 59, Sayfa 1767- 1808. 2015.
- 18 Cochrane Injuries Group. Human albumin administration in critically ill patients: systematic review of randomised controlled trials. Cochrane Injuries Group Albumin Reviewers. *British Journal of Medicine*, 1998. 317: p. 235-40.
- 19 Morgan, G.E., M.S. Mikhail, and M.J. Murray, *Clinical anesthesiology*. 4th ed. 2006, New York: Lange Medical Books/McGraw Hill, Medical Pub. Division. xiv, 1105 p.
- 20 Van Der Linden P, James M, Mythen M, Weiskopf RB. Safety of modern starches used during surgery. *Anesth Analg* 2013; 116:35.
- 21 Perner A, H.N., Guttormsen AB, Tenhunen J, Madsen KR, Scandinavian Critical Care Trials; Hydroxyethyl starch 130/0,42 versus Ringer' acetate in severe sepsis. *N Engl J med*, 2012. 367: p. 124-34.
- 22 Özcan N. Monitörizasyon. Keçik Y, ed. *Temel Anestezi*. Güneş Tıp Kitap Evleri. Ankara: 2012.p.745-63.
- 23 Hamilton WFMJ,Kinsman JI.Studies on the circulation.IV.Further analysis of the injection method and of changes in hemodynamics under physiological and pathological conditions.*Am J Phsiol*.1932;99:534-551.
- 24 Yosunkaya A, Gök F. Yoğun Bakımda Hemodinamik Monitörizasyon. *Türkiye klinikleri J Anest Reanim-Special Topics* 2012;5:1-13.
- 25 Diaz K, Kelly SG, Smith B, Malani PN, Younger JG. A prospective study of central venous catheters placed in a ter-tiary care Emergency Department: indications for use, infectious complications, and natural history. *Am J Infect Cont-rol* 2012;40(1):65-7.
- 26 Bentzer P, Griesdale DE, Boyd J, MacLean K, Sirounis D, Ayas NT. Will this hemodynamically unstable patient respond to a bolus of intravenous fluids? *JAMA*. 2016;316:1298–309.
- 27 Marik PE, Cavallazzi R. Does the central venous pressure predict fluid responsiveness? An updated meta-analysis and a plea for some common sense. *Crit Care Med*. 2013;41:1774–81.
- 28 Legrand M, Dupuis C, Simon C, Gayat E, Mateo J, Lukaszewicz AC, et al. Association between systemic hemodynamics and septic acute kidney injury in critically ill patients: a retrospective observational study. *Crit Care*. 2013;17:R278.
- 29 Marik PE. Iatrogenic salt water drowning and the hazards of a high central venous pressure. *Ann Intensive Care*. 2014;4:21.
- 30 Marik PE, Baram M and Vahid B. Does central venous pressure predict fluid responsiveness?: A systematic review of the literature and the tale of seven mares. *Chest*. 2008;134(1):172-8.
- 31 Osman D, et al. Cardiac filling pressures are not appropriate to predict hemodynamic response to volume challenge. *Critical Care Med*. 2007;35(1):64-68.)
- 32 cavllara functional hemodynamic monitoring and dynamic indices of fluid responsiveness *Minerva anesthesiol* 2008; 74:123-35.
- 33 Yang X and Du B. Does pulse pressure variation predict fluid responsiveness in critically ill patients? A systematic review and meta-analysis. *Crit Care*. 2014;18(6):650.

- 34 1- Superior Vena Caval Collapsibility as a Gauge of Volume Status in Ventilated Septic Patients. *Intensive Care Med.* 2004 sep; 30(9):1734-9
- 35 The respiratory variation in inferior vena cava diameter as a guide to fluid therapy. *Intensive Care Medicine* 30(9):1834-7.
- 36 Marik PE, Monnet X, Teboul JL. Hemodynamic parameters to guide fluid therapy. *Ann Intensive Care.* 2011;1:1.
- 37 Vignon P, Repesse X, Begot E, Leger J, Jacob C, Bouferrache K, et al. Comparison of echocardiographic indices used to predict fluid responsiveness in ventilated patients. *Am J Respir Crit Care Med.* 2016.
- 38 Monnet X, Marik P and Teboul JL. Passive leg raising for predicting fluid responsiveness: a systematic review and meta-analysis. *Intensive Care Med*, 2016;42(12):1935-47.
- 39 Monnet X, et al. Passive leg-raising and end-expiratory occlusion tests perform better than pulse pressure variation in patients with low respiratory system compliance. *Crit Care Med*, 2012;40(1):152-7.
- 40 Predicting fluid responsiveness in patients undergoing cardiac surgery: functional haemodynamic parameters including the Respiratory Systolic Variation Test and static preload indicators. *British Journal of Anaesthesia*, Volume 95, Issue 6, December 2005, Pages 746–755.
- 41 Muller L, Toumi M, Bousquet PJ, Riu-Poulenc B, Louart G, Candela D, Zoric L, Suehs C, de La Coussaye JE, Molinari N, Lefrant JY; AzuRéa Group: An increase in aortic blood flow after an infusion of 100ml colloid over 1 minute can predict fluid responsiveness: The mini-fluid challenge study. *Anesthesiology* 2011; 115:541–7.
- 42 Mallat J, Meddour M, Durville E, Lemyze M, Pepy F, Temime J, Vangrunderbeeck N, Tronchon L, Thevenin D, Tavernier B: Decrease in pulse pressure and stroke volume variations after mini-fluid challenge accurately predicts fluid responsiveness. *Br J Anaesth* 2015; 115:449–56.
- 43 Rocca GD, Vetrugno L, Tripi G, Deana C, Barbariol F, Pompei L. Liberal or restricted fluid administration: are we ready for a proposal of a restricted intraoperative approach? *Bio Medical.*
- 44 Strunden MS, Heckel K, Goetz AE, Reuter DA. Perioperative fluid and volume management: physiological basis, tools and strategies. *Annals of Intensive Care* 2011;1(1):2.
- 45 Doherty M, Buggy DJ. Intraoperative fluids: how much is too much? *British Journal of Anaesthesia* 2012;109(1):69-79.
- 46 Fluid Balance and Acute Kidney Injury: Potential Adverse Effects of Liberal Fluid Therapy. *Medscape* [Cited 7 June 2016].
- 47 Nisanveich V, Feisenstein J, Almogy G, Weissman C, Einav S, Matot I. Effect of intraoperative fluid management on outcome after intraabdominal surgery. *Anesthesiology* 2005;103:25-32.
- 48 Yunos NM, Bellomo R, Hegarty C, Story D, Ho L, Bailey M. Association between a chloride-liberal vs chloride-restrictive intravenous fluid administration strategy and kidney injury in critically ill adults. *Journal of The American Medical Association* 2012;308:1566-1572.
- 49 Zhang J, Qiao H, He Z, Wang Y, Che X, Liang W. Intraoperative fluid management in open gastrointestinal surgery: Goal-directed versus restrictive. *Clinics* 2012; 67(10): 1149-1155.

- 50 Bundgaard-Nielsen M, Secher NH, Kehlet H. 'Liberal'vs.'restrictive'perioperative fluid therapy—a critical assessment of the evidence. *Acta Anaesthesiologica Scandinavica* 2009;53(7):843-851.
- 51 Futier E, Constantin JM, Petit A, Chanques G, Kwiatkowski F, Flamein R, et. al. Conservative vs restrictive individualized goal-directed fluid replacement strategy in major abdominal surgery: A prospective randomized trial.
- 52 Kayilioglu SI, Dinç T, Sozen İ, Bostanoglu A, Cete M, Coskun F. Postoperative fluid management. *World Journal Critical Care Medicine* 2015; 4(3):192-201.
- 53 Jhanji S, Pearse RM. The use of early intervention to prevent postoperative complications. *Curr Opin Crit Care*. 2009;15:349–54.
- 54 Desai SR. Acute respiratory distress syndrome: Imaging of the injured lung. *Clin Radiol* 2002;57:8-17.
- 55 Gürsel G. Akut solunum sıkıntısı sendromu (ARDS). *Yoğun Bakım Dergisi* 2(2): 96-107, 2002.
- 56 Tissue hypoxia: How to detect, how to correct, how to prevent; consensus conference. *Am J Respir Crit Care Med* 154: 1573-8, 1996.
- 57 Huang C, Wang Y, Li Y. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet*. 2020;395:497–506.
- 58 Tissue hypoxia: how to detect, how to correct, how to prevent; consensus conference: *Am J Respir Crit Care Med* 1996;154: 1573-1578.
- 59 Rivers E, Nguyen B, Havstad S, Ressler J, Muzzin A, Knoblich B, et al. *Early goal-directed therapy in the treatment of severe sepsis and septic shock. N Engl J Med* 2001;345:1368-77.
- 60 Alhazzani W, Møller MH, Arabi YM, Loeb M, Gong MN, Fan E, et al. Surviving Sepsis Campaign: Guidelines on the Management of Critically Ill Adults with Coronavirus Disease 2019 (COVID-19). *Crit Care Med* 2020;10.1097/CCM.0000000000004363.