



ZEHIRLENMELER VE TOKSİKOLOJİK ACİLLERDE YAPAY ZEKA KULLANIMI

Melih ŞENGÜL¹

Zeynep KARAKAYA²

GİRİŞ

Zehirlenmeler acil servis başvurularının dikkate değer bir bölümünü oluşturur ve tanı-tedavi sürecinin zaman duyarlı doğası nedeniyle erken tanı, uygun resüsitasyon ve hızlı tedavi başlangıcı yaşamsal önem taşır. Akut zehirlenme yönetiminin temelini sistematik bir ilk yaklaşım, olası toksidromların tanınması, seçilmiş olgularda dekontaminasyon ve spesifik antidotların **endikasyona göre uygulanması** oluşturur. Ayrıca, kardiyotoksik ya da solunum depresyonu yapan ajanlara bağlı yaşamı tehdit eden durumlarda ileri yaşam desteği ve zehirlenmeye özgü resüsitasyon stratejileri kritik rol oynamaktadır (1,2).

Klinik belirsizliğin yüksek olduğu; alınan maddenin bilinmediği, çoklu madde maruziyetinin olası olduğu ya da maruziyet zamanının belirsiz kaldığı olgularda karar verme gücü artar. Bu senaryolarda toksidrom temelli yaklaşım, hedefe yönelik laboratuvarlar ve yatakbaşı monitorizasyon ile toksik ajan spektrumunun daraltılması önerilir; zehir danışma/zehir merkezi ile erken iletişim, hem hasta

¹ Dr., İzmir Katip Çelebi Üniversitesi, Tıp Fakültesi, Acil Tıp AD., melih.sengul@hotmail.com, ORCID iD: 0009-0007-3268-2359

² Prof. Dr., İzmir Katip Çelebi Üniversitesi, Tıp Fakültesi, Acil Tıp AD., zeynepkarakaya76@hotmail.com, ORCID iD: 0000-0003-0562-8297

DOI: 10.37609/akya.63.c680

KAYNAKLAR

1. Kaswa R. An approach to the management of acute poisoning in emergency settings. *S Afr Fam Pract* (2004). 2024;66(1):e1-e5. Published 2024 Feb 27. doi:10.4102/safp.v66i1.5841
2. Lavonas, E. J., Akpunonu, P. D., Arens, A. M., Babu, K. M., Cao, D., Hoffman, R. S., ... & American Heart Association. (2023). 2023 American Heart Association focused update on the management of patients with cardiac arrest or life-threatening toxicity due to poisoning: an update to the American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation*, 148(16), e149-e184.
3. World Health Organization. (2023). Poison centres as essential unit for poisoning prevention and sound chemicals management: technical summary. In *Poison centres as essential unit for poisoning prevention and sound chemicals management: technical summary*.
4. Chyka PA, Seger D, Krenzelok EP, Vale JA; American Academy of Clinical Toxicology; European Association of Poisons Centres and Clinical Toxicologists. Position paper: Single-dose activated charcoal. *Clin Toxicol (Phila)*. 2005;43(2):61-87. doi:10.1081/clt-200051867
5. Jrayed, Roz Hamdan1; Alshangiti, Safia Ali2; Alhassan, Rakan Aref3; Alanazi, Nouf Obaidullah4; Mahfooz, Hajer Ali Bin5; Alfaris, Raseel Khalil5; Ahbail, Ali Ahmad6; Alawad, Fatema Hani7; Mohaini, Mohammad Al8,9; Aldanyowi, Saud Nayef10. Therapeutic Effectiveness and Safety of Activated Charcoal in Poisoning Management in Emergency Settings: A Systematic Review and Meta-analysis. *Journal of Advanced Trends in Medical Research* 1(3):p 929-937, Jul-Sep 2024. | DOI: 10.4103/ATMR.ATMR_158_24
6. Yong LPX, Tung JYM, Cheung NMT, et al. Artificial Intelligence Applications in Emergency Toxicology: Advancements and Challenges. *J Med Internet Res*. 2025;27:e73121. Published 2025 Aug 22. doi:10.2196/73121
7. Zellner T, Romanek K, Rabe C, et al. ToxNet: an artificial intelligence designed for decision support for toxin prediction. *Clin Toxicol (Phila)*. 2023;61(1):56-63. doi:10.1080/15563650.2022.2144345
8. Teferi, M. G., Mengistie, B. T., Teklehaimanot, H. K., Mengistie, C. T., Gemechu, F. A., Negussie, M. A., ... & Hassen, G. W. (2025). Artificial intelligence in clinical toxicology in Africa: Emerging applications and barriers. *African Journal of Emergency Medicine*, 15(4), 100901.
9. Dart RC, Mullins ME, Matoushek T, et al. Management of Acetaminophen Poisoning in the US and Canada: A Consensus Statement. *JAMA Netw Open*. 2023;6(8):e2327739. Published 2023 Aug 1. doi:10.1001/jamanetworkopen.2023.27739
10. Javadipour M, Keshzar E, Parvasi P, Hosseini SF, Rahmani AH. Electrocardiogram Abnormality in Poisoned Patients with Tricyclic Antidepressant. *Med J Islam Repub Iran*. 2024;38:35. Published 2024 Apr 1. doi:10.47176/mjiri.38.35
11. Mostafa F, Chen M. Computational models for predicting liver toxicity in the deep learning era. *Front Toxicol*. 2024;5:1340860. Published 2024 Jan 19. doi:10.3389/ftox.2023.1340860
12. Koleček TA, Dreisbach C, Bourne PE, Bakken S. Natural language processing of symptoms documented in free-text narratives of electronic health records: a systematic review. *J Am Med Inform Assoc*. 2019;26(4):364-379. doi:10.1093/jamia/ocy173
13. Au Yeung, J., Shek, A., Searle, T. et al. Natural language processing data services for healthcare providers. *BMC Med Inform Decis Mak* 24, 356 (2024). <https://doi.org/10.1186/s12911-024-02713-x>
14. van Dam, P.M., van Doorn, W.P., van Gils, F. et al. Machine learning for risk stratification in the emergency department (MARS-ED) study protocol for a randomized controlled pilot trial on the implementation of a prediction model based on machine learning technology predicting 31-day mortality in the emergency department. *Scand J Trauma Resusc Emerg Med* 32, 5 (2024). <https://doi.org/10.1186/s13049-024-01177-2>
15. Yuan S, Yang Z, Li J, Wu C, Liu S. AI-Powered early warning systems for clinical deterioration significantly improve patient outcomes: a meta-analysis. *BMC Med Inform Decis Mak*. 2025;25(1):203. Published 2025 Jun 2. doi:10.1186/s12911-025-03048-x

16. Golder S, O'Connor K, Wang Y, Klein A, Gonzalez Hernandez G. The Value of Social Media Analysis for Adverse Events Detection and Pharmacovigilance: Scoping Review. *JMIR Public Health Surveill.* 2024;10:e59167. Published 2024 Sep 6. doi:10.2196/59167
17. van Baardewijk, J. U., Agarwal, S., Cornelissen, A. S., Joosen, M. J., Kentrop, J., Varon, C., & Brouwer, A. M. (2021). Early detection of exposure to toxic chemicals using continuously recorded multi-sensor physiology. *Sensors*, 21(11), 3616.
18. Difrancesco S, van Baardewijk JU, Cornelissen AS, Varon C, Hendriks RC, Brouwer AM. Exploring the use of Granger causality for the identification of chemical exposure based on physiological data. *Front Netw Physiol.* 2023;3:1106650. Published 2023 Mar 15. doi:10.3389/fnetp.2023.1106650
19. Srikrishnarka, P., Haapasalo, J., Hinestroza, J. P., Sun, Z., & Nonappa. (2024). Wearable sensors for physiological condition and activity monitoring. *Small Science*, 4(7), 2300358.
20. García-Queiruga, M., Fernández-Oliveira, C., Mauríz-Montero, M. J., Porta-Sánchez, Á., Margusino-Framiñán, L., & Martín-Herranz, I. (2021). Development of the @ Antidotos_bot chatbot tool for poisoning management. *Farmacia hospitalaria*, 45(4), 180-183.
21. Zhang R, Wen H, Lin Z, Li B, Zhou X. Artificial Intelligence-Driven Drug Toxicity Prediction: Advances, Challenges, and Future Directions. *Toxics.* 2025;13(7):525. Published 2025 Jun 23. doi:10.3390/toxics13070525
22. Poojari, P. G., Thunga, G., Nair, S., Kunhikatta, V., & Rao, M. (2019). A global overview of poison treatment apps and databases. *International journal of toxicology*, 38(2), 146-153.
23. Chang DW, Lin CS, Tsao TP, et al. Detecting Digoxin Toxicity by Artificial Intelligence-Assisted Electrocardiography. *Int J Environ Res Public Health.* 2021;18(7):3839. Published 2021 Apr 6. doi:10.3390/ijerph18073839
24. Alam, R., Aguirre, A., & Stultz, C. M. (2024). Detecting QT prolongation from a single-lead ECG with deep learning. *PLOS Digital Health*, 3(6), e0000539.
25. Malka-Markovitz, A., Camara Dit Pinto, S., Cherkaoui, M. et al. Multiscale modeling of drug-induced liver injury from organ to lobule. *npj Digit. Med.* 8, 383 (2025). <https://doi.org/10.1038/s41746-025-01736-6>
26. Cheng CT, Lin HH, Hsu CP, et al. Deep Learning for Automated Detection and Localization of Traumatic Abdominal Solid Organ Injuries on CT Scans. *J Imaging Inform Med.* 2024;37(3):1113-1123. doi:10.1007/s10278-024-01038-5