

Diabetic Ketoacidosis in Pediatric Patients

Jarrold Genther

Otterbein University

NURS 6810- Advanced Pathophysiology

Deana Batross, DNP & Shivani Bhatnagar, DNP

July 29, 2022

Diabetic Ketoacidosis in Pediatric Patients

Abstract

Diabetic ketoacidosis is a life-threatening complication in children with type 1 diabetes. Children with type 1 diabetes cannot produce endogenous insulin and must receive exogenous insulin to allow glucose influx into cells throughout the body for energy consumption. Without insulin, the child will progress to diabetic ketoacidosis. The covid-19 pandemic introduced new obstacles for patients with a predisposition for type 1 diabetes, presenting with a more profound acidosis, greater need for supplemental oxygen, and increased vasopressor requirements. Diagnostically, DKA presents as hyperglycemia with metabolic acidosis and low serum bicarbonate levels. Treatment aims to restore intravascular volume, correct electrolyte abnormalities, improve acid-base balance, and treat insulin deficiency. In conclusion, DKA is a severe medical condition that can result in death without medical intervention. Understanding signs, symptoms, pathology, diagnosis, and treatment is crucial for healthcare workers to provide safe and effective care for these patients.

References

- Calimag, A. P., Chlebek, S., Lerma, E. V., & Chaiban, J. T. (2022). Diabetic ketoacidosis. *Disease-a-Month*, 101418. <https://doi.org/10.1016/j.disamonth.2022.101418>
- Chambers, M. A., Mecham, C., Arreola, E., & Sinha, M. (2022). Increase in the number of pediatric new-onset diabetes and diabetic ketoacidosis cases during the covid-19 pandemic. *Endocrine Practice*, 28(5), 479–485. <https://doi.org/10.1016/j.eprac.2022.02.005>
- Cohen, M., Shilo, S., Zuckerman-Levin, N., & Shehadeh, N. (2015). Diabetic ketoacidosis in the pediatric population with type 1 diabetes. In *Major topics in type 1 diabetes*. InTech. <https://doi.org/10.5772/60592>
- Diabetic Ketoacidosis*. (2021, March 25). Centers for Disease Control and Prevention. <https://www.cdc.gov/diabetes/basics/diabetic-ketoacidosis.html>
- Elisha, S., Heiner, J. S., & Nagelhout, J. J. (2022). *Nurse anesthesia* (7th ed.). Elsevier.
- Giwa, A., Ahmed, R., Omidian, Z., Majety, N., Karakus, K., Omer, S. M., Donner, T., & Hamad, A. A. (2020). Current understandings of the pathogenesis of type 1 diabetes: Genetics to environment. *World Journal of Diabetes*, 11(1), 13–25. <https://doi.org/10.4239/wjd.v11.i1.13>
- Hall, J. E., & Hall, M. E. (2020). *Guyton and hall textbook of medical physiology (guyton physiology)* (14th ed.). Elsevier.
- Jayashree, M., Williams, V., & Lyer, R. (2019). Fluid therapy for pediatric patients with diabetic ketoacidosis. *Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy*, 12, 2355–2361. <https://doi.org/10.2147/DMSO.S194944>

Jensen, E. T., Stafford, J. M., Saydah, S., D'Agostino, R. B., Dolan, L. M., Lawrence, J. M., Marcovina, S., Mayer-Davis, E. J., Pihoker, C., Rewers, A., & Dabelea, D. (2021).

Increase in prevalence of diabetic ketoacidosis at diagnosis among youth with type 1 diabetes: The search for diabetes in youth study. *Diabetes Care*, 44(7), 1573–1578.

<https://doi.org/10.2337/dc20-0389>

Kichloo, A., El-amir, Z., Wani, F., & Shaka, H. (2021). Hospitalizations for ketoacidosis in type 1 diabetes mellitus, 2008 to 2018. *Baylor University Medical Center Proceedings*, 35(1), 1–5. <https://doi.org/10.1080/08998280.2021.1978741>

Tzimenatos, L., & Nigrovic, L. E. (2021). Managing diabetic ketoacidosis in children. *Annals of Emergency Medicine*, 78(3), 340–345.

<https://doi.org/10.1016/j.annemergmed.2021.02.028>

Yuan, X., Wang, J., Chen, X., Yan, W., Niu, Q., Tang, N., Zhang, M., Gu, W., & Wang, X. (2022). Effects of the timing of the initiation of dietary intake on pediatric type 1 diabetes for diabetic ketoacidosis. *BMC Pediatrics*, 22(1).

<https://doi.org/10.1186/s12887-022-03243-z>