

## Resuscitation With Ringer's Lactate Compared With Normal Saline for Pediatric DKA

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**Background & Objectives:** The aims of this study were to describe the use of Ringer's lactate (LR) or normal saline (NS) for resuscitation among children with diabetic ketoacidosis (DKA) and compare the effect of fluid type on cost, length of stay, and rate of cerebral edema (CE).

**Methods:** This is a retrospective study of 49,737 children aged 0 to 17 years with DKA between January 1, 2005, and September 30, 2015, using data from the Pediatric Health Information System. Treatment with LR or NS was identified. Our primary outcomes were total adjusted cost and length of stay. Our secondary outcome was CE rate per 1000 episodes.

## ACADEMIC P.E.A.R.L.S

Pediatric Evidence And Research Learning Snippet



### Initial fluid for DKA : NS or RL or either

#### Results:

- The majority of patients were treated with NS (n = 43,841 [88%]) compared with LR (n = 1762 [4%]) or both NS and LR (n = 4134 [8%]). Hospital-year-specific practice patterns were used to investigate the effect of fluid type across resuscitation fluid groups. Total adjusted cost was \$1160 less (95% confidence interval, -1468 to -852), or -14.2%, for cases with any episode of LR compared with NS only.
- Length of stay was not different across groups.
- The rate of cerebral edema per 1000 episodes was 12.7 for cases with any episode of LR compared with 34.6 NS only (difference, -21.9; 95% confidence interval, -30.4 to -13.3).

**Conclusions:** Ringer's lactate was infrequently used for resuscitation of pediatric DKA patients. However, resuscitation with LR compared with NS was associated with lower total cost and rates of CE.

**Key message:** Further investigation using patient-level clinical and laboratory data is needed to evaluate factors that drive cost and risk of CE development with each fluid.

**Thoughts:** Normal saline (0.9%) has been the traditional fluid of choice, for both, volume resuscitation and deficit replacement in DKA. However, normal saline may not be as "normal" as one would imagine, as reports of higher risk of acute kidney injury (AKI) and acidosis, related to its chloride content are emerging. The risk of AKI with chloride liberal fluids still remains a contentious issue. As we await more answers, the current recommendation for volume resuscitation and replacement remains normal saline. (2)

### EXPERT COMMENT

**"The study reveals that although normal saline was the most commonly used fluid for resuscitation in paediatric diabetic ketoacidosis, Ringer's lactate was associated with lesser chances of cerebral edema in these patients. This being a retrospective study calls for a further prospective RCT to establish these findings beyond doubt."**

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With warm regards,

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#### Reference

1. Bergmann, Kelly R DO; Abuzzahab, M. Jennifer MD et al. Resuscitation with Ringer's lactate compared with Normal saline for pediatric diabetic ketoacidosis. Paediatric emergency care: May 2021- Volume 37- Issue 5- p e236-e242.
2. Jayashree M, Williams V, Iyer R. Fluid Therapy For Pediatric Patients With Diabetic Ketoacidosis: Current Perspectives. *Diabetes Metab Syndr Obes.* 2019;12:2355-2361. Published 2019 Nov 12. doi:10.2147/DMSO.S194944