Acute kidney injury in children and adolescents hospitalized for diabetic ketoacidosis

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Objective

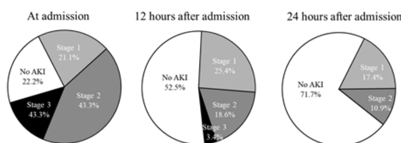
- Diabetic ketoacidosis (DKA) is associated with dehydration and which can cause acute kidney injury (AKI).
- However, few studies have been reported AKI caused by DKA in children
- This study aimed to assess the aimed to investigate the incidence rate, risk factors in children and adolescents hospitalized for DKA.

Methods

- Retrospective study of single center from January 2004 to December 2018
- Medical records of children and adolescents (aged <18 years) presenting with type 1 diabetes mellitus and DKA were reviewed.
- A total of 90 episodes of DKA in 58 children were included in the analysis.
- AKI was diagnosed according to the 2012 KDIGO criteria.

Results

Fig 1. Proportions of AKI



AKI occurred in a total of 70 hospitalizations of 44 children at admission. The number of AKI decreased to 28 (47.4%) after 12H and 13 (28.3%) after 24 H of admission

Table 2. Logistic regression analyses to identify risk factors of AKI

Variables	Univariate	
	Exp(B)	*P-value*
Duration of TIDM (years)	1.310	0.006
Previously diagnosed diabetes	3.750	0.012
WBC > 25 x 10^3/mm^3	3.115	0.152
HCO_3 (mEq/L)	1.005	0.057
Anion gap (mEq/L)	1.134	0.029
	Multivariate	
	Exp(B)	*P-value*
Duration of TIDM (years)	1.284	0.011
Anion gap (mEq/L)	1.123	0.060

Table1. Baseline characteristics

	No AKI (n=20*)	AKI (n=70*)	*P*-value
Age (years)	11.8 ±3.9	11.7 ±3.4	0.942
Gender, male, n (%)	5 (25.0%)	17 (24.3%)	0.948
Newly diagnosed diabetes, n (%)	12 (60.0%)	20 (28.6%)	0.010
Duration of TIDM (years)	1.7 ± 2.7	4.1 ±3.3	0.001
Laboratory findings			
WBC (10^3/mm^3)	12.2 ± 6.7	20.0 ±9.5	0.001
Hematocrit level (%)	42.9 ± 3.0	42.4 ± 3.8	0.595
Platelet (/mm^3)	315.8 ± 119.4	366 ± 96.4	0.053
Glucose (mg/dL)	504.2 ±196.1	456.2 ±136.8	0.216
BUN (mg/dL)	15.8 ± 5.2	19.6 ±7.3	0.032
Creatinine (mg/dL)	0.6 ±1.9	1.0 ±0.3	<0.001
Na (mEq/L)	132.8 ±4.2	133.2 ±4.4	0.718
K (mEq/L)	4.4 ±0.8	4.5 ±0.8	0.504
CRP (mg/dL)	1.0 ±1.0	1.0 ±1.7	0.975
HCO_3 (mEq/L)	10.4 ± 4.7	7.4 ± 3.7	0.004
Anion gap (mEq/L)	21.7 ± 4.9	24.6 ± 5.0	0.025
Hemoglobin A1c (%)	13.5 ± 2.1	12.7 ±2.1	0.105
DKA severity			0.413
Mild, n (%)	6 (30.0%)	13 (18.6%)	
Moderate, n (%)	8 (40.0%)	26 (37.1%)	
Severe, n (%)	6 (30.0%)	31 (44.3%)	
Hospitalization (day)	8 (2-18)	8 (2-32)	0.598

Conclusion

- AKI is highly prevalent in children and adolescents with DKA.
- Longer duration of diabetes was associated with development of AKI.

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