

Acute Kidney Injury among Patients with Diabetic Ketoacidosis: Experience from BIRDEM General Hospital

Presented by-

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Introduction

Methods

Results

Discussion

INTRODUCTION

- Diabetic ketoacidosis (DKA) is one the most common and serious hyperglycaemic emergencies among patients with diabetes mellitus (DM).
- Over three-quarter of type-1 diabetic patients may first present with DKA [1]

1. Onyiriuka AN, Ifebi E. Ketoscidosis at diagnosis of type 1 diabetes in children and adolescents: frequency and clinical characteristics. J Diab Metc Dis 2013;12:47.

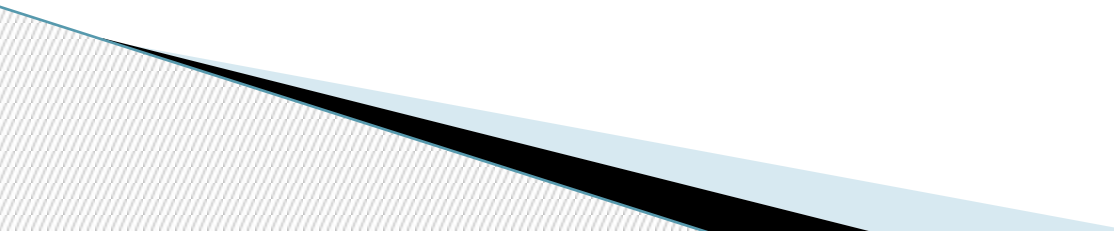
- DKA commonly complicates previously diagnosed diabetic patients of any type specially if they get infection or become non-compliant to insulin treatment . [2]
- AKI incidence is reported to be very high in DKA in children, but less well studied among adult patients.

Objective

The objective of this study was to evaluate the incidence of AKI among adult DKA patients.



Methods

- ▶ Type of study-cross-sectional
 - ▶ Place of study-BIRDEM General Hospital
 - ▶ Duration of study-4 years starting from January 2008.
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Inclusion criteria

- ▶ Hospitalized adult patients with a clinical diagnosis of DKA primarily constituted the study population.
- ▶ Diagnosis of DKA and classification was done by using American Diabetic Association (ADA) criteria.[3]
- ▶ AKI was diagnosed according to acute kidney injury network (AKIN) criteria. [4]

3. Kitabchi AE, Umpierrez GE, Miles JM, Fisher JN. Hyperglycaemic crises in adult patients with diabetes. *Diabetes Care* 2009;32(7):1335–43.

4. Mehta RL, Kellum JA, Shah SV, Molitoris BA, Ronco C, Warnock DG et al. Acute Kidney Injury Network: report of an initiative to improve outcomes in acute kidney injury. *Crit Care* 2007;11(2):R31.

Exclusion criteria

- Patients with ketonuria and high blood glucose with a normal arterial pH were excluded from the study.

Results

Total number of patients were 200.



Base-line characteristics of the study population (N=200)

Characteristics	Results
Mean age (years)	37.6±7.5
Male: Female	1:1.3
Known DM: New diagnosis of DM	2.4:1
Rural: Urban	1.1:1

Base-line characteristics of the study population (N=200) cont.

Characteristics	Results
Mean RBG at admission mmol/l	27.1±7.5
Mean HbA1c (%)	11.3±3.7
Severe acidosis (pH <7)	8.5%

Clinical presentations of the study populations (N=200)

Features	Frequency(percentage)
Nausea	126 (63)
Vomiting	122 (61)
Polyuria	86 (43)
Polydipsia	85 (42.5)
Fever	58 (29)

Clinical presentations of the study populations (N=200)

Features	Frequency(percentage)
Abdominal pain	56(28)
Breathlessness	56(28)
Drowsiness	40(20)
Blurred vision	26(13)
Coma	14(7)

Severity of DKA among the study subjects and distribution of AKI among them (N=200)

Severity of DKA	Frequency (%)	AKI (%)
Mild (pH 7.25-7.30)	72 (36)	0 (0)
Moderate (pH 7.0-7.24)	111 (55.5)	44 (39.6)
Severe (pH <7.0)	17 (8.5)	15 (88.2)

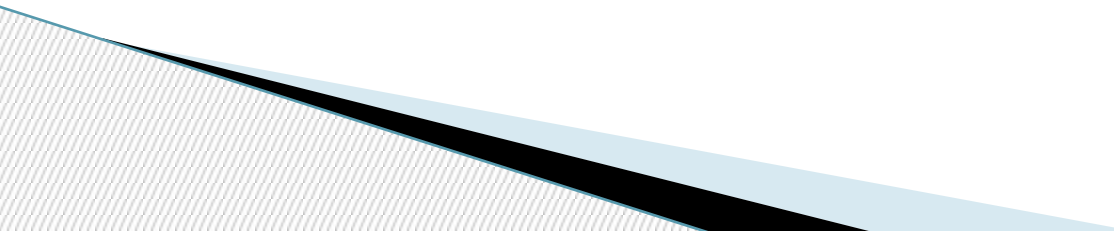
Precipitating causes of DKA and distribution of AKI among them (N=200)

Causes	Frequency (Percentage)	AKI (frequency, %)
Infection	91 (40.5)	32 (35.2)
Non-compliance	62 (31)	8 (12.9)
Acute pancreatitis	10 (5)	9 (90)

Precipitating causes of DKA and distribution of AKI among them (N=200)

Causes	Frequency(%)	AKI(%)
Acute MI	4(2)	0(0)
Surgery	3(1.5)	2 (66.7)
Stroke	2(1)	0(0)
Unidentified	28(14)	8 (28.6)

Outcome

- ▶ AKI – 59/200 (29.5%)
 - ▶ RRT required in 3 (3/59, 5.1%)
 - ▶ Death 6.5%
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Discussion

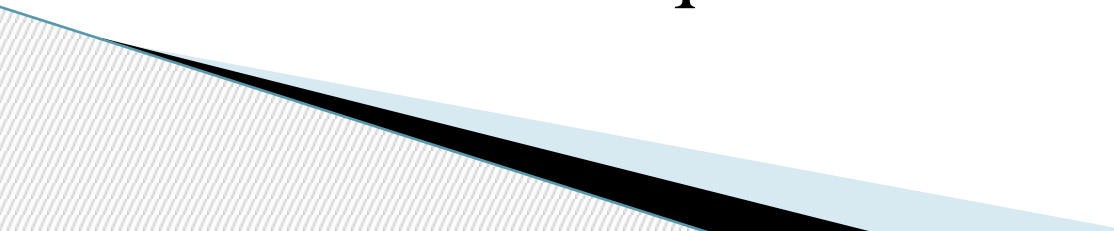
- AKI is a recognized complication of DKA.
- As osmotic diuresis leading to dehydration is the most common mechanism of pre-renal AKI in the setting of DKA, rehydration remains as the main therapeutic intervention.

▶ In a small number of cases specific therapy like haemodialysis is required. Obran J-C et al. in a ten year retrospective study found that only 3% patients with DKA complicated by AKI required dialysis.

▶ In current study, the overall mortality was 6.5%. Death occurred mostly in patients who presented late or had pancreatitis and sepsis as aetiology

and those cases who were complicated by AKI. AKI resulting from intravascular volume contraction or dehydration in DKA responded rapidly on rehydration, but infectious cases and DKA precipitated by acute pancreatitis required special attention.

Conclusion

- ▶ Almost one-third of DKA cases had AKI in this study, more in DKA cases precipitated by acute pancreatitis and sepsis.
 - ▶ Fluid resuscitation resolved AKI in most cases but few cases required renal replacement therapy.
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Thank you all



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