

# Clinical and biochemical assessment of patients with diabetes emergencies in Aminu Kano Teaching Hospital, Kano, North West, Nigeria.

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★**Background:** Hyperglycemic emergencies (HEs) are critical acute complications resulting from uncontrolled diabetes, and can pose life-threatening risks. Most previous Nigerian studies<sup>1</sup> on HEs lacked comprehensive assessments of plasma ketones and blood pH which are crucial biochemical indicators that impact on management outcomes.

★**Objectives:** We aimed to evaluate the clinical and biochemical characteristics of patients with diabetic emergencies as well as assess their treatment outcomes in a Nigerian tertiary health centre.

★**Patients and methods:** We conducted a cross-sectional descriptive study of ninety (90) patients presenting with diabetic emergencies at the emergency unit, outpatient department, and intensive care unit (ICU) of Aminu Kano Teaching Hospital in Kano, Nigeria. The study included clinical evaluations, laboratory assessments, treatment interventions, and follow-up. Based on laboratory findings, patients were categorized into subgroups: diabetes ketoacidosis (DKA), euglycaemic DKA (EDKA), Hyperosmolar hyperglycemic state (HHS), mixed DKA/HHS, and hypoglycemia.

★**Results:** The study comprised of 53 males and 37 females, with a male-to-female ratio of 1.4:1. The patients age ranges between 18 to 87 years, with a mean age of  $50.5 \pm 17.6$ . DKA accounted for 33.3% of the cases, HHS for 31.1%, Mixed (DKA/HHS) for 17.8%, hypoglycemia for 13.3%, and EDKA for 4.4%. Common precipitating factors for hyperglycemic emergencies included infections (32.1%), poor medication adherence (16.7%), newly diagnosed diabetes (10.3%), and acute stroke (9.0%).

Type 2 diabetes (T2DM) predominated in all groups, with the highest proportions in patients with HHS (100%), hypoglycemia (91.7%), and the Mixed state (81.3%). Patients with HHS and Mixed DKA/HHS presented with the highest mean admitting blood glucose values  $30.7 \pm 2.9$  mmol/L and  $31.4 \pm 2.1$  mmol/L, respectively. In participants with DKA had a significantly lower in DKA group, followed by mixed and then HHS group ( $6.9 \pm 0.18$ ,  $7.1 \pm 0.19$  and  $7.4 \pm 0.06$ , respectively;  $p < 0.001$ ). Hypokalemia ( $K^+ < 3.5$  mmol/L) was predominant in patients with DKA (67.6%) and mixed crises (68.8%), compared to those with HHS (42.9%).

The study revealed differences in the duration of hospital stay and mortality rates among the emergency subgroups, with DKA and Mixed DKA/HHS showing longer hospital stays compared to HHS 14 days and 12 days respectively. The overall mortality rates were 14/90 (15.6%; 95% CI: 8.1 – 23%), and were influenced by factors such as non-adherence to treatment, the presence of hypertension, length of hospital stay, acute kidney injury (AKI), and cerebral oedema.

★**Discussion:** Diabetic ketoacidosis (DKA) was the most common form of DM emergency diagnosed, this is similar to what was reported in recent studies among Africans and can be explained by the rising incidence of ketoacidosis among individuals with T2DM especially among Africans.<sup>2</sup> Mortality rates for patients with HEs was significantly higher than the earlier figures reported in various studies across Nigeria.

★**Conclusion:** DKA was the most common type of diabetic emergency and had slightly higher mortality than HHS. Infections, non-adherence to treatment, and newly diagnosed diabetes were identified as key precipitating factors for hyperglycemic emergencies.

★**Key words:** diabetic ketoacidosis, hyperglycemic emergencies, hyperosmolar hyperglycemic state, mixed DKA/HHS.

## ★REFERENCES

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