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(RESEARCH ARTICLE)

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Assessment of Treatment Pattern and Clinical Factors Associated with Diabetic Keto-acidosis admitted in the Department of General Medicine: A Cross-Sectional study at a Government Tertiary Care Teaching Hospital, Mandya, Karnataka, India

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Abstract

Background: Diabetic ketoacidosis (DKA) is a life-threatening acute complication of diabetes mellitus, commonly associated with type 1 diabetes but increasingly seen in patients with type 2 diabetes. It is characterized by hyperglycemia, ketosis, and metabolic acidosis. Prompt recognition of clinical features, identification of precipitating factors, and timely management are essential to reduce morbidity and mortality.

Objectives: The aim of this study was to evaluate the clinical profile, precipitating factors, and prescribing patterns among patients with diabetic ketoacidosis admitted to the Department of General Medicine, MIMS Hospital, Mandya.

Methods and Methodology: This cross-sectional study was conducted over a period of six months in a tertiary care teaching hospital. A total of 83 in-patients diagnosed with DKA were included based on the inclusion criteria. Data were collected using a suitably designed case profile form, which documented demographic details, clinical presentations, precipitating factors, treatment patterns, and outcomes. Descriptive statistics and percentage analysis were used for data interpretation.

Results: Out of 83 patients, males (56.6%) were more commonly affected than females (43.3%). Type 2 diabetes mellitus (92.8%) was predominant compared to type 1 diabetes mellitus (7.2%). The majority of patients were in the 20–40 years age group (36.1%). The most common presenting symptoms were nausea and vomiting (63.8%), abdominal pain (43.3%), dehydration (30.1%), and altered sensorium (30.1%). Infections (73.4%) and non-compliance with treatment (66.2%) were the leading precipitating factors, with pneumonia (40.9%) and urinary tract infection (27.8%) being the most frequent infections. All patients received subcutaneous insulin and intravenous normal saline, while 85.5% were given intravenous insulin. Potassium supplementation was administered in 71% of cases, and sodium bicarbonate was reserved for severe cases (14.4%). The majority of patients (56.6%) were discharged within 5 days of hospitalization.

Conclusion: The study highlights that DKA is more prevalent among patients with type 2 diabetes in this setting, with infection and poor treatment adherence being the major precipitating factors. Rational prescribing patterns, particularly the use of insulin and fluid therapy, were consistent with standard guidelines and contributed to favorable outcomes. Improved patient education, strict adherence to therapy, and effective infection control measures are essential to reduce the burden of DKA and improve patient outcomes in tertiary care hospitals.

Keywords: Diabetic Keto-acidosis; Clinical Factors; Insulin; Anti-diabetic Drugs; Infections

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1. Introduction

Diabetes mellitus is a chronic metabolic disorder characterized by persistent hyperglycemia resulting from defects in insulin secretion, insulin action, or both. It arises due to abnormal carbohydrate metabolism, leading to impaired utilization of glucose by body tissues. Insulin, a hormone produced by the pancreas, plays a crucial role in transporting glucose from the bloodstream into cells for energy production. In diabetes, insufficient insulin activity causes excess glucose to remain in the blood, resulting in high blood sugar levels. If left untreated, this condition can lead to serious and potentially life-threatening complications. Although diabetes has no permanent cure, proper medical treatment and lifestyle modifications enable affected individuals to live healthy lives. Diabetes mellitus is broadly classified into prediabetes, type 1 diabetes, type 2 diabetes, and gestational diabetes. Prediabetes is an intermediate stage marked by elevated blood glucose levels and an increased risk of developing type 2 diabetes and cardiovascular disease. Type 1 diabetes is an autoimmune condition commonly occurring in childhood, where immune-mediated destruction of pancreatic beta cells leads to absolute insulin deficiency.

Type 2 diabetes, the most prevalent form, is mainly associated with insulin resistance and obesity and increasingly affects younger populations. Gestational diabetes develops during pregnancy due to insulin resistance and usually resolves after delivery, though it increases future diabetes risk. Diabetes mellitus is associated with numerous acute and chronic complications affecting the nerves, eyes, kidneys, heart, and blood vessels. One of the most severe acute complications is diabetic ketoacidosis (DKA). DKA is characterized by hyperglycemia, metabolic acidosis, and excessive ketone production. It results primarily from insulin deficiency combined with elevated counter-regulatory hormones. This hormonal imbalance promotes fat breakdown and ketone formation, leading to acidosis and electrolyte disturbances. DKA often presents rapidly with symptoms such as polyuria, polydipsia, vomiting, abdominal pain, dehydration, and deep rapid breathing.

It is more common in individuals with type 1 diabetes but may also occur in type 2 diabetes. Delayed diagnosis and poor access to healthcare contribute to its high prevalence, especially in children. Prompt diagnosis and early treatment are essential to reduce morbidity and mortality. Management focuses on fluid replacement, insulin therapy, electrolyte correction, and treating the underlying cause. Improved awareness and early intervention remain key to preventing diabetes-related complications.

2. Material and methods

A cross-sectional study was conducted. Before the commencement of the study, approval from Institutional Ethical Committee for the research was obtained. Patients who were diagnosed with diabetic keto-acidosis (DKA) from in-patients admitted in the department of general medicine of a teaching hospital Mandya institute of medical science (MIMS) during the study period of 6 months were chosen for the study. Sample size of 83 were in the study.

2.1. Study Criteria

2.1.1. Inclusion Criteria

In-patients who are diagnosed with DKA

2.1.2. Exclusion Criteria

- Patients who are admitted with severe malnutrition were excluded
- Pregnancy and lactating women were excluded.

2.2. Methods of Data Collection

All the Data relevant to the patients were collected from the Patients record. The patients records include socio-demographic details, diagnosis, treatment and management of disease.

2.3. Analysis

Data collected will be coded and checked for completeness and uniformity, then data will be entered in MS Excel worksheet was used and the results were presented in tables and graphs or expressed as percentages according to the type of information collected. For continuous variables, mean and standard deviations will be calculated.

3. Results and discussion

Out of 83 patients, males (56.6%) were more commonly affected than females (43.3%). Type 2 diabetes mellitus (92.8%) was predominant compared to type 1 diabetes mellitus (7.2%). The majority of patients were in the 20–40 years age group (36.1%). The most common presenting symptoms were nausea and vomiting (63.8%), abdominal pain (43.3%), dehydration (30.1%), and altered sensorium (30.1%). Infections (73.4%) and non-compliance with treatment (66.2%) were the leading precipitating factors, with pneumonia (40.9%) and urinary tract infection (27.8%) being the most frequent infections. All patients received subcutaneous insulin and intravenous normal saline, while 85.5% were given intravenous insulin. Potassium supplementation was administered in 71% of cases, and sodium bicarbonate was reserved for severe cases (14.4%). The majority of patients (56.6%) were discharged within 5 days of hospitalization.

Table 1 Patients distribution based on gender

Gender	Number of patients	Percentage
Male	47	56.6%
Female	36	43.3%

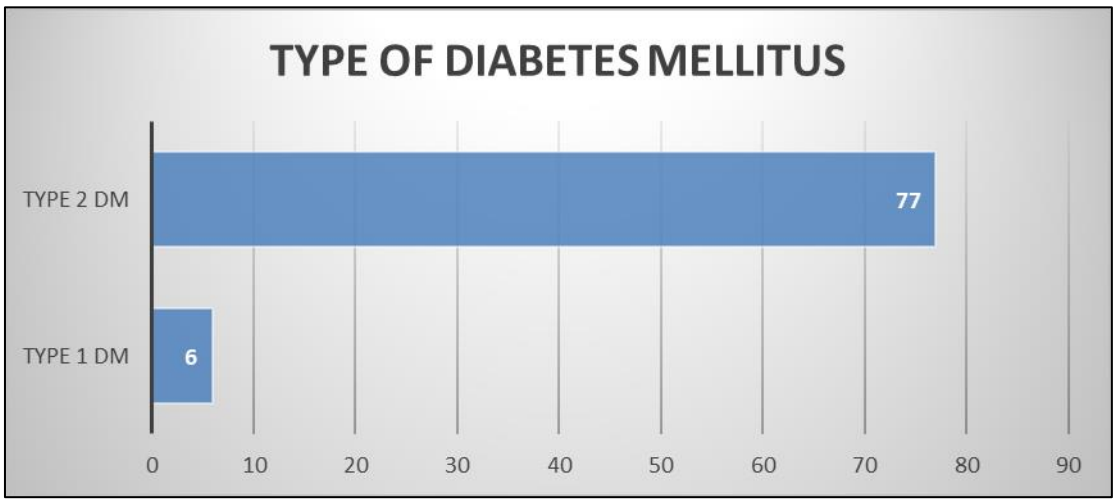

Figure 1 Patient distribution based on Type of Diabetes mellitus

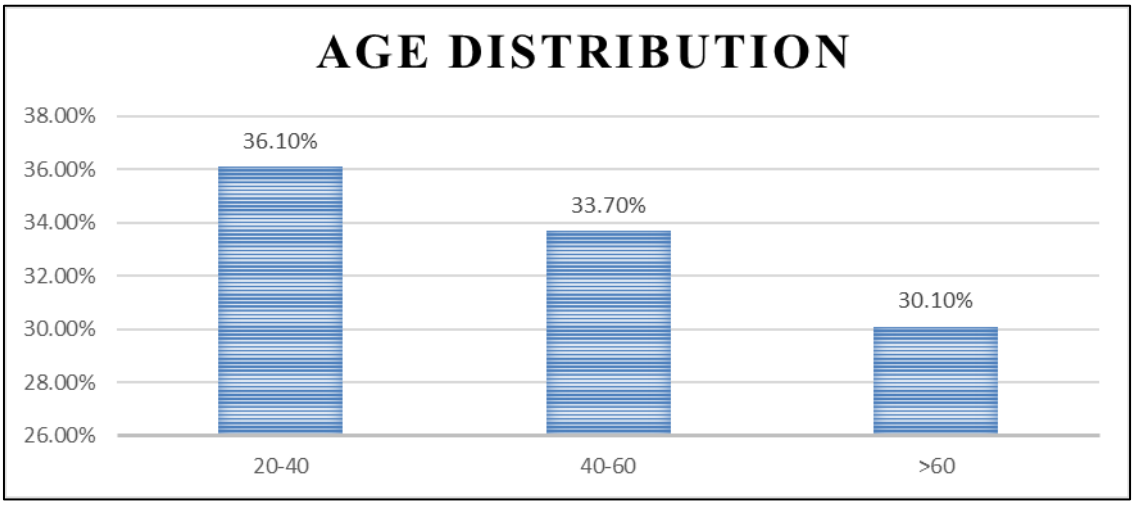

Figure 2 Bar graph showing the age distribution

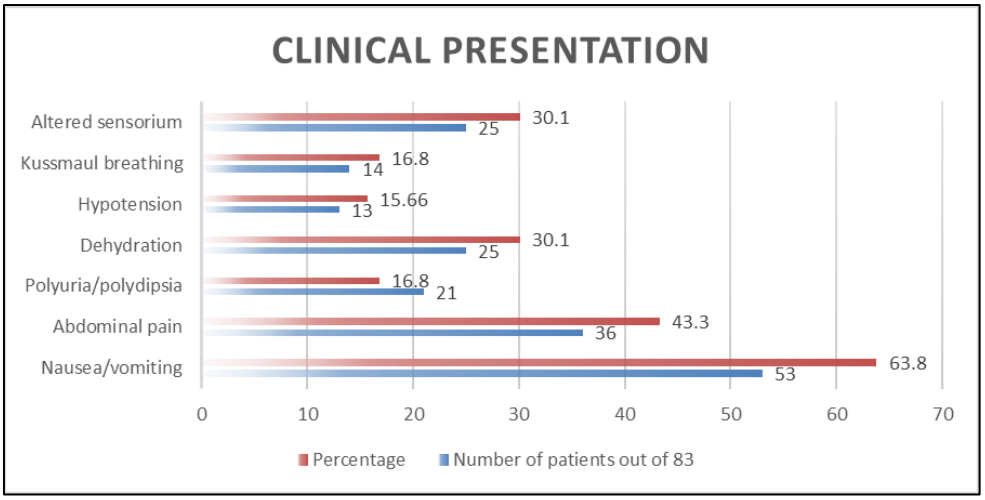

Figure 3 Frequency of clinical presentation

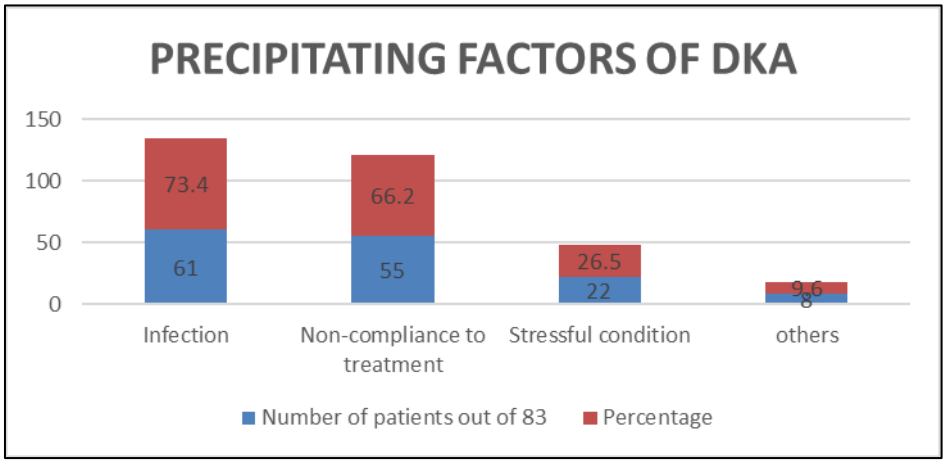

Figure 4: Frequency of precipitating factors of DKA

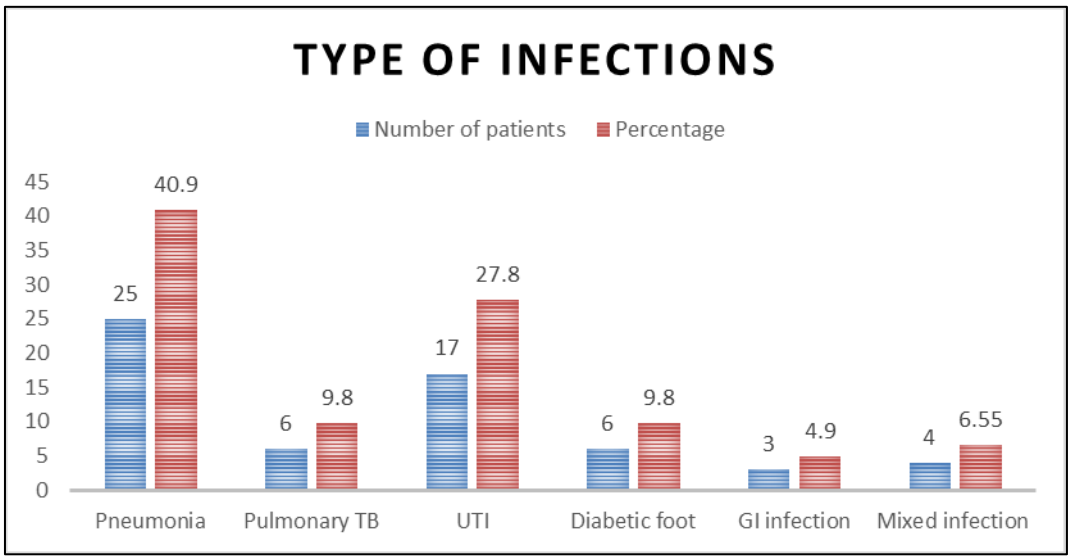

Figure 5 Type of infection precipitating to DKA

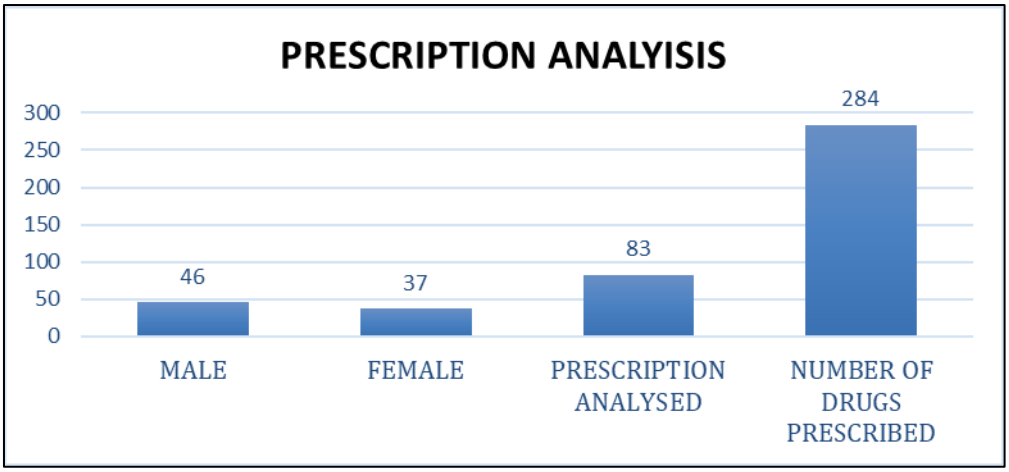

Figure 6 Frequency of prescription analysis

Table 2 Prescribing pattern of drugs in DKA patients

Drugs	Number of patients out of 83	Percentage
OHA	59	71
INSULIN (IV)	71	85.5
INSULIN (SC)	83	100
KCL	59	71
NaHCO3	12	14.4
IV NORMAL SALINE	83	100
IV RINGER'S LACTATE	55	66.2

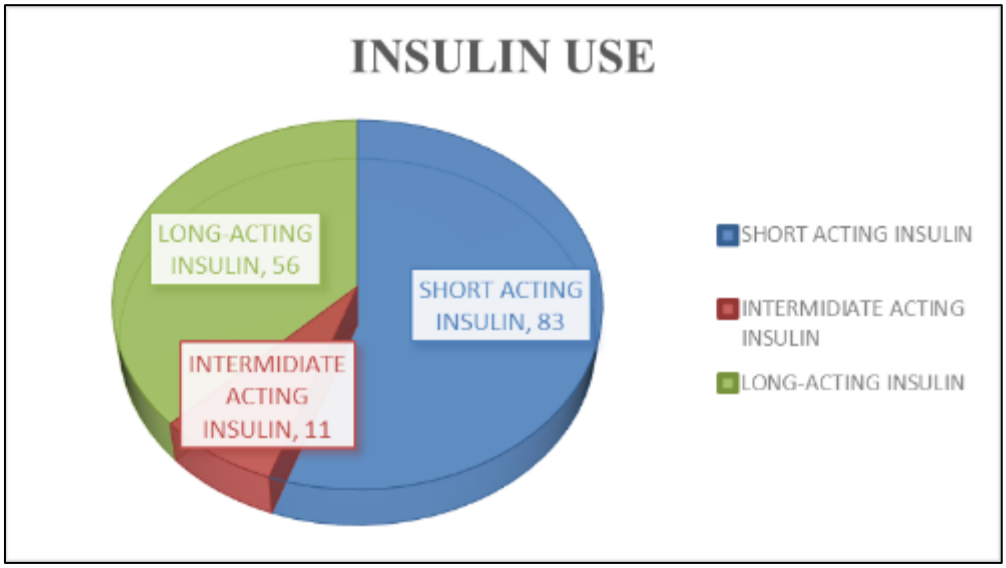

Figure 7 Pie chart showing insulin prescribed

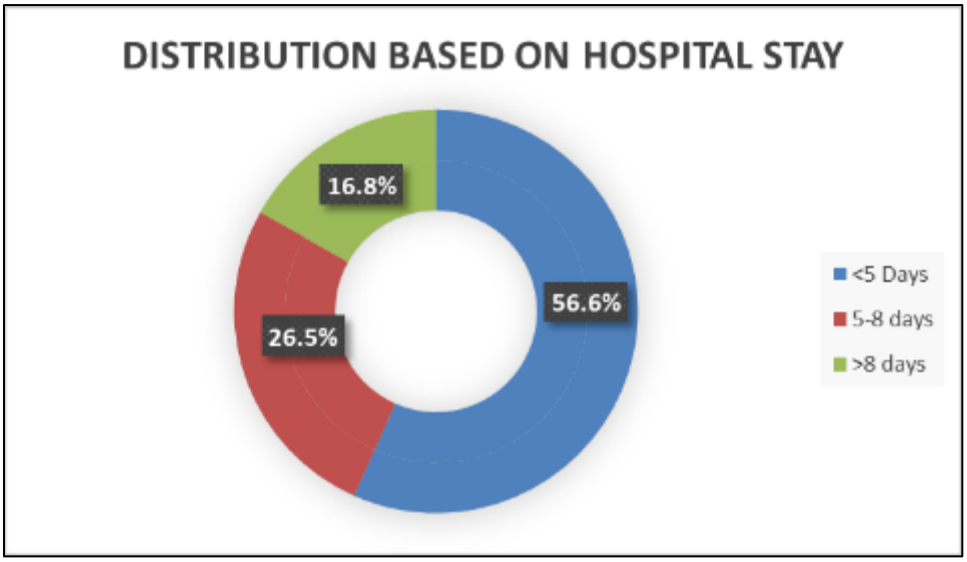

Figure 8 Distribution based on hospital stay

4. Conclusion

The present study was conducted in the Department of General Medicine, MIMS Hospital, Mandya, with the objective of evaluating the clinical presentations, precipitating factors, and prescribing patterns in patients with diabetic ketoacidosis (DKA). A total of 83 patients were enrolled, among whom males (56.6%) were more commonly affected than females (43.3%). The majority of cases were associated with type 2 diabetes mellitus (92.8%), while only a small proportion had type 1 diabetes mellitus (7.2%). Most patients were between 20–40 years of age, suggesting that DKA is not confined to younger populations but is increasingly seen in adults with type 2 diabetes as well.

Among 83 patients, the most common clinical features were nausea and vomiting (63.8%), abdominal pain (43.3%), dehydration (30.1%), and altered sensorium (30.1%), which align with the classical presentation of DKA. Infections (73.4%) and non-compliance with treatment (66.2%) were identified as the major precipitating factors, with pneumonia and urinary tract infections being the most frequent infectious triggers. These findings emphasize the need for infection control, patient counselling, and strict adherence to therapy to prevent recurrence of DKA.

Analysis of prescribing patterns revealed that insulin and intravenous fluid therapy formed the cornerstone of management, with all patients receiving subcutaneous insulin and IV normal saline. Intravenous insulin was used in 85.5% of cases, while long-acting insulin was prescribed in 67.4%. Potassium supplementation was administered in 71% of patients, and sodium bicarbonate was used only in severe cases. The overall prescribing pattern adhered to standard treatment guidelines, reflecting rational management practices.

The majority of patients (56.6%) were discharged within 5 days of hospitalization, whereas a smaller proportion required extended stays due to complications. This highlights the effectiveness of early diagnosis and prompt treatment in reducing morbidity and hospital stay duration.

In conclusion, the study demonstrates that DKA remains a serious but preventable complication of diabetes, predominantly triggered by infections and poor treatment adherence. Strengthening patient education, ensuring regular follow-up, and implementing effective infection control strategies can significantly reduce the incidence of DKA. The rational prescribing practices observed in this study underline the importance of guideline-based management, which plays a vital role in improving patient outcomes in a tertiary care setting.

Compliance with ethical standards

Acknowledgements

The assistance from the Mandya Institute of Medical Sciences, Mandya is gratefully acknowledged.

Disclosure of Conflict of interest

No conflict of interest to be disclosed

Statement of ethical approval

Ethical approval was obtained from the Institutional Ethics Committee of Mandya Institute of Medical Science.

Statement of informed consent

Informed consent was obtained from all individual participations included in the study

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