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Clinical Profile and Precipitating Factors of Diabetic Ketoacidosis at Tertiary Care Centre in Western Rajasthan

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Abstract

Introduction: Diabetic ketoacidosis (DKA) and hyperosmolar non-ketotic coma are the two most common acute complications of diabetes mellitus. Therefore, the present study has been planned to evaluate the profile of precipitating factors and clinical profile of DKA and to decrease mortality due to lack of information.

Materials and Methods: It was a cross-sectional study conducted in Department of Medicine at S.N Medical college, Jodhpur on 150 Diabetic ketoacidosis patients from JAN 2019-JAN 2020. During hospitalization, Patients were evaluated in terms of the detailed history and clinical examination to rule out probable risk of various infections and drug compliance.

Result: Majority of cases belonged to age group 21-40 years (36.8%). Pain abdomen was the most common complaint found in 86 (59.7%) cases. In our study, 14(9.7%) were newly diagnosed diabetic and majority of cases had their HbA1c level >9.0. Infection was the most common precipitating found in 45.1% cases.

Conclusion: The most common precipitating factors are infection and non-compliance to anti-diabetic treatment. A significant proportion of patients can present as DKA as first presentation. Prompt and effective treatment can reduce morbidity and mortality.

Keywords: Diabetes mellitus, non-ketotic, haemoglobin, Medical Care

Introduction

Diabetes mellitus is rapidly becoming a common metabolic problem in both urban and rural populations. Diabetic ketoacidosis (DKA) and hyperosmolar non-ketotic coma (HONK) are the two most common acute complications of diabetes mellitus[1]. Diabetic ketoacidosis (DKA) is a serious but potentially preventable complication.

DKA tends to occur in individuals younger than 19 years in type 1 diabetics whereas it may occur at any age in type 2 diabetics[2]. It is the leading cause of morbidity and is the most common cause of diabetes-related deaths in children and adolescents with type 1 diabetes. Infection and poor compliance to treatment are the leading triggers in the development of DKA[3] Patients with undiagnosed diabetes mellitus may present primarily with DKA to their health care provider.

Poor baseline glycaemic control and elevated hyperglycated haemoglobin (HbA1C) have been associated with recurrent DKA[4]. Therefore, this study was planned to evaluate the profile of precipitating factors and complications of DKA and measures to decrease mortality among people through universal education programs, improved medical care, and access to medical advice.

Materials and Methods

It was a cross-sectional study conducted in Department of Medicine at S.N Medical college, Jodhpur on 150 Diabetic ketoacidosis patients for a period from JAN 2019 - JAN 2020. Patient's demographic, anthropometric, clinical characteristics were recorded and filled in the proforma. During hospitalization, the patients evaluated in terms of the detailed history and clinical examination to rule out probable risk of various infections and drug compliance. Serum electrolytes (sodium, potassium), venous blood glucose and capillary blood glucose were determined. Urinary ketone was checked by using special urine strip test.

Results

Majority of cases belonged to age group 21-40 years (36.8%) followed by 41-60 years (27.8%), >60 years (19.4%). Mean age in our study was 41.40±18.28 years. Our study was male predominance with male to female ratio was 1.5:1. Pain abdomen was the most common complaint where total 86(59.7%) cases were found while 52.8% cases had fever, 19.4% cases had cough, 38.2% cases had shortness of breath, 56.3% cases had vomiting, 13.2% cases had loose motion, 25% cases had body ache, 6.3% cases had weakness and 6.9% cases had altered sensorium. In our study, 14(9.7%) were newly diagnosed with Diabetes. In respect to treatment history, 68(47.2%) cases were on insulin while 56(38.9%) cases were on OHA and 20(13.9%) cases were on both OHA and Insulin. In our study, majority of cases had their HbA1c level >9.0. According to diagnosis, infection was the most common precipitating factor in 65(45.1%) cases while 39 cases were drug defaulter, and 12 cases were newly diagnosed. In respect to infection, respiratory infection was present in 21(32.3%) cases, gastrointestinal infection was present in 16(24.6%), UTI was present in 11(16.9%) and viral fever was present in 10 (15.4%) cases.

Discussion

Diabetic ketoacidosis is one of the acute metabolic complication of diabetes mellitus which is fatal if not accurately treated. DKA occurs mainly in type1 DM patients. However, type 2 DM patients might develop DKA under severe stress or illness with metabolic decompensation. Mortality rates in DKA in developed countries and developing countries show much variation. Mean age of patients in our study was 41.40 years. Out of total 144 patients, 85 were males and 59 were females with a male to female ratio 1.44:1, suggestive of male predominance. DKA usually presents with nausea and vomiting, polyuria and polydipsia, abdominal pain and dizziness and altered sensorium. About presenting complaints, one study found that most patients had a history of vomiting for a duration of at least one day (74%), and 69% of the patients had abdominal pain[5]. The 20-year study conducted in Riyadh showed that vomiting occurred in 61.6% of patients, abdominal pain was present in 56.6%[6]

The prevalence of diabetic ketoacidosis as the first manifestation of diabetes varied from 12.8% to 80%. The dominant frequency was found in the developing countries (80% in the United Arab Emirate) and the lowest frequency in developed countries (12.8% in Sweden)[7]. It shows that education on the early symptoms of diabetes should be enhanced, so that new diabetic

patients are not neglected, and they would not refer to hospitals having severe complications such as DKA. In our study DKA was first time presentation in 9.7% of cases, slightly lower percentage than above results. Our study result matches with Bashir et al[8] (10%) and Katz et al[9] which also found that 10% patients were newly diagnosed. The mean HbA1c level of the study group is 11.41% indicating poor control which may have led them developing DKA. This is consistent with reports that patients with high HbA1c levels, especially greater than 10%, had higher risks of developing DKA[10,11] irrespective of diabetes type and duration.

WE found that infections were the predominant precipitating factors for DKA in all admissions, followed by poor compliance to insulin. Similar results were reported in studies from the Pakistan[12], and India[13]. In a study conducted by Randall et al[14], insulin discontinuation (non-compliance) was the leading precipitating cause in 68% of patients; other causes were new-onset diabetes (10%), infection (15%), medical illness (4%), and undetermined causes (3%).Similar to above studies in present study, infection was the most common diagnosis, where 45.1% (65) cases were found while 27.1% (39) cases were non complaint.

Conclusion

The most common presenting complaints in DKA are vomiting and abdominal pain. The most common precipitating factors are infection and non-compliance to anti-diabetic treatment. A significant proportion of patients could present as DKA as first presentation. Prompt and effective treatment can reduce morbidity and mortality. Therefore, education of all diabetic patients, family members and medical staffs about warning symptoms of ketosis is mandatory for early diagnosis, referring to a hospital and treatment.

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