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STUDY OF CLINICAL PRESENTATION, PRECIPITATING FACTORS, SEVERITY OF DIABETIC KETOSCAIDOSIS IN TYPE 1 AND TYPE 2 DIABETICS.

Medicine

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ABSTRACT

Background: Diabetic Ketoacidosis (DKA) is the most severe acute metabolic complication of diabetes mellitus (DM). Recent epidemiologic studies estimate that hospitalizations for DKA have increased during the past 2 decades.The present study aims to study clinical presentation, precipitating factors, severity of diabetic ketoacidosis in type1 and type2 diabetics.

Methods: The present study is a cross sectional observational study including 60 patients which was completed over a period of 2 years. Patients with random Blood Glucose of >250mg%, ketonuria of 2+ or more on urine dipstick, with evidence of acidosis demonstrated by pH <7.3,$HCO3^-$<15 mEq/L, and a high anion gap (>12) included in the study and subjected to thorough medical examination to obtain detailed history and clinical features.

Results And Conclusion: Incidence of DKA declined after 4thdecad, in present study 39 (65.0%) were type 1 diabetes cases (DM1) and 21 (35.0%) were type 2 diabetics (DM2).The most common presenting symptom of DKA was abdominal pain(30%) followed by vomiting(27%) ; While infection followed by noncompliance to insulin being common precipitating factors. More severe DKA cases were among the DM1 diabetics compared to DM2 category according to the P^H.

KEYWORDS

Diabetic Ketoacidosis, Diabetes Mellitus.

INTRODUCTION

Together with hyperglycemic coma, diabetic Ketoacidosis (DKA) is the most severe acute metabolic complication of diabetes mellitus (DM).[1] DKA consists of the triad of hyperglycemia, ketosis, and acidemia. An arterial pH of less than 7.35, a Serum Bicarbonate (HCO_3-) value of less than 15 mEq/L, and a blood glucose level of greater than 250 mg/dl with a moderate degree of ketonaemia and/or ketonuria (as determined by nitroprusside method) are necessary for the diagnosis of DKA.[2]

DKA usually presents with symptoms like nausea, vomiting, pain abdomen. They may also have increased thirst and polyuria. On examination usually a fruity odour can be smelled and the breathing is typical of DKA, rapid shallow kussmaul breathing. Severe cases may present with hypotension, altered sensorium. Features of the precipitating cause may also be present.[3]

DKA can be the initial presentation of diabetes mellitus or precipitated in known patients with diabetes mellitus by many factors, most commonly infection.[4] Other precipitating factors include acute myocardial infarction, any cerebrovascular accident or any postoperative stress. Studies of Vignati et al., emphasized the importance of infection as a precipitating cause occurring in up to 50% of patients.[5]

Noncompliance is also one major precipitating factor for DKA. Matoo et al., found that incidence of non-compliance to treatment was 20% and while Westphal found it 16%.[6,7]

DKA is the most common acute complication in children and adolescents with Type 1 Diabetes which leads to high mortality. It accounts for almost 50% mortality in diabetic patients younger than 24 years of age.[8]

Recent epidemiologic studies estimate that hospitalizations for DKA have increased during the past 2 decades. Part of this increased frequency of admissions may be related to the increased prevalence of type 2 diabetes. . With the changes in the frequency of DKA and the increased incidence of DKA in patients with type 2 diabetes mellitus, the question may be posed of whether there has been any change in the clinical or laboratory characteristics of the patients with DKA With this background, the present study was conducted to study the clinical presentation, precipitating factors and to determine severity of diabetic ketoacidosis in type 1 and type 2 diabetics"

AIMS AND OBJECTIVES:

To Study of clinical presentation, precipitating factors, severity of diabetic ketoacidosis in type1 and type2 diabetics.

MATERIALS AND METHODS:

This was a cross sectional observational study conducted at Dr. D. Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune. 60 diabetic patients were included in the study, fulfilling the inclusion criteria for diabetic ketoacidosis as follows: Random Blood Glucose (RBS) of >250mg%, ketonuria of 2+ or more on urine dipstick, with evidence of acidosis demonstrated by 1 or more of the following; pH <7.3,$HCO3^-$<15 mEq/L, and a high anion gap (>12). (R). Patients less than 13 years of age, those with history of recent alcohol consumption in the last 36 hours and with history of poisoning with salicylate, ethylene glycol, paraldehyde, methanol, were excluded from this study.

Written and informed consent was taken from the patients or relatives. All the patients were subjected to medical examination as per a fixed proforma.

Detailed history, clinical features and c peptide levels used to differentiate type 1 DM and type 2 DM. The collected data was compiled in MS Excel Sheet. For analysis of this data SPSS software was applied.

INVESTIGATIONS:

Blood sugar level measured using glucose oxidase peroxidase method, Urine Ketone by multi-reagent dip stick, C peptide levels, Serum

electrolytes, Renal function tests, Arterial blood gas using the Cobas b 121 ABG analyser, Serum bicarbonate, Anion gap, HbA1c, Haemogram, Urine routine examination and microscopy was done.

OBSERVATION –

- In our study highest ranges of cases were in 40-49 years (23.3%).
- 39 (65.0%) were type 1 diabetes cases (DM1) and 21 (35.0%) were type 2 diabetes cases (Dm2).
- Mean BMI in DM1 group was 19.3 years and in DM2 group was 24.2 years. There was significant difference in BMI among both the groups ($p<0.01$).

The most common presenting symptoms were abdominal pain (30%) followed by vomiting (26.7%).

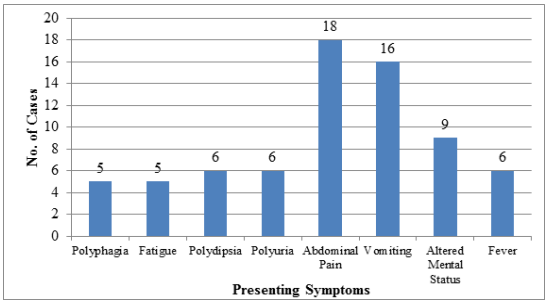

Figure 1 :Distribution of cases according to presenting symptoms

- Among the infections, would infection be the most common followed by urinary tract infection and Tuberculosis. In non-infection causes vascular complications (11.7%) and noncompliance to insulin (30%) were common.

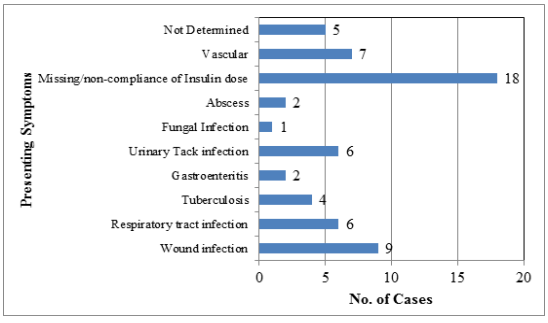

Figure 2 :Distribution of cases according to Precipitating factors of DKA

- Mean HBCA1% in DM1 group was 11.9% and in DM2 group 10.7%. Overall mean urine Ketone was 2.6 mg/dl.
- While mean urine Ketone in DM1 group was 2.7 mg/dl and in DM2 group 2.3 mg/dl. This difference was statistically significant (p 0.013).
- In DM1 Group most of the cases were in moderate group (59%). In DM2 group most of the cases were in mild and moderate group according to the p^H. (47.6%and52.4% respectively).

DISCUSSION AND CONCLUSION:

- Out of total 60 cases included in the study, 39 (65.0%) were type 1 diabetes cases (DM1) and 21 (35.0%) were type 2 diabetes cases (DM2). In a study by Newton CA.et al[9] 78 cases were having type 1 diabetes and 25 cases had type 2 diabetes.
- In the present study mean BMI in DM1 group was 19.3 years and in DM2 group was 24.2 years.
- In the present study the most common symptoms were abdominal pain (30%) followed by vomiting (26.7%). In a study by MG Mahesh et al,[10] the most common presenting symptom was found to be vomiting seen in almost 50% of individuals.
- In the present study in half of the cases, precipitating factor was infection while 25 cases were due to non-infectious origin. Wound infection be the most common followed by urinary tract infection and Tuberculosis. In non-infection causes noncompliance to insulin (30%) was common. In a study by Huri HZ et al, [11] among the 265 cases of DKA, infection (40.5%) was the most common precipitating factor of DKA.
- In the present study the mean HbA1C was 11.3% and in DM1 and DM2 group it was 11.9 and 10.7 % respectively. These differences were statistically significance (p 0.014).
- In the present study, highest cases were in moderate category according to p^H. In DM1 Group most of the cases were in moderate and severe group (46.2% and 41.0% respectively). In DM2 group most of the cases were in mild and moderate severity group (47.6% and 52.4% respectively). In a study by Barski L et al,[12] in contrast to our study, in this study, proportion severe cases, in DM2 group was higher compared to DM1 group.

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