



TYPE II DIABETICS; FREQUENCY OF DIABETIC KETOACIDOSIS

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ABSTRACT... Objectives: To determine the frequency of diabetic ketoacidosis in type II diabetic patients. **Study Design:** Cross sectional study. **Setting:** Department of Medicine, Sahiwal Medical College Sahiwal. **Period:** September 2014 to March 2015. **Material and method:** Permission was taken from Institutional review board and written informed consent was taken from every patient. Total 189 patients with type II DM (Un-controlled) having Fasting plasma glucose level ≥ 126 mg/dl either male or female having age 35 years to 65 years were included in the study. **Results:** Total 189 patients with type II diabetes mellitus were included in this study. Mean age of the 50.09 ± 9.39 years. Male patients were 79 (42%) and female patients were 110 (58%). Insignificant association between gender and Ketoacidosis was seen. No association of family history of diabetes mellitus with Ketoacidosis was found. **Conclusion:** Results of this study showed that male or female can be equally victim of diabetic ketoacidosis. Diabetic ketoacidosis can be develop equally in younger or older age group. No significant difference for the development of diabetic ketoacidosis was found between obese/non-obese and patients with family history of diabetes or without family history of diabetes.

Key words: Diabetes mellitus, diabetic ketoacidosis, fasting plasma glucose, random plasma glucose.

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INTRODUCTION

Diabetes mellitus (DM) is a syndrome with disordered metabolism and inappropriate hyperglycemia because of reduction in secretion of insulin or with combination of insulin resistance and insufficient insulin secretion to compensate.¹ In year 2000 the prevalence of DM was 2.8% and it will be reached to 4.4% by the year 2030.²

According to some small scale studies which were conducted in different areas of Pakistan, the prevalence of DM was 5.3% but exact prevalence of DM is not available in literature.³

From last two decades the prevalence of DM has increased dramatically. It is supposed that the number of diabetics will grow from 135 million to 300 million by the year 2025 globally. Unluckily the main increase will take place in under develop countries and in Pakistani population, the number of patients with DM is estimated to be doubled by the year 2025. In Pakistan about eight million

people have DM and almost the same number is suffering from impaired glucose tolerance.⁴

Diabetic ketoacidosis (DKA) and hyperosmolar non ketotic coma are the most common acute complications of DM.^{5,6} DKA is a life threatening medical emergency and its mortality rate varies from 1-10% which depends on the experience of treating hospital or medical center.⁷

In present study the frequency of DKA will be determined in type II diabetic patients presenting at Medical Departments of DHQ Teaching Hospital, Sahiwal.

In Pakistan, the frequency of diabetic ketoacidosis in patients with diabetes mellitus has not been much studied. The results of this will provide us the local data regarding DKA and will also be helpful to improve medical care of the patients and will decrease morbidity and mortality of patients presenting with DKA.

MATERIAL AND METHOD

This study was conducted at Department of Medicine, Sahiwal Medical College Sahiwal from September 2014 to March 2015. Permission was taken from Institutional review committee and written informed consent was taken from every patient. Total 189 patients with type II DM (Uncontrolled) having Fasting plasma glucose level ≥ 126 mg/dl either male or female having age 35 years to 65 years were enrolled in this study. Patients with random plasma glucose > 600 mg/dL, serum osmolality > 310 mosm/kg, patients with hepatic uremic encephalopathy and patients with stroke were excluded from the study.

Weight and height was measured of all patients for BMI. Family history of diabetes mellitus was also recorded in pre-designed proforma. Random sample of 5 ml blood was drawn and send to the laboratory for investigations like glucose, blood pH and Serum bicarbonate. Fasting urine sample was also be taken for ketones. Demographic data like age and gender was also entered in predesigned Performa.

Data was entered on computer software SPSS version 16. Mean \pm SD was calculated for age as quantitative variable. Frequencies and percentages were done for ketoacidosis, gender, obesity and family history of diabetes mellitus as categorical variables. Stratification was done for age, gender, obesity and family history of diabetes mellitus to control the effect modifiers. Chi-square test was applied and p-value $\leq 5\%$ was considered as statistically significant.

RESULTS

Total 189 patients with DM-II were included in this study. Mean age of the 50.09 ± 9.39 years. Out of 189 patients male patients were 79 (42%) and female patients were 110 (58%). (Fig. 1)

Among the 189 patients, 120 (63%) patients were with family history of diabetes mellitus and 69 (37%) patients was without family history of diabetes mellitus. (Fig. 2). As shown in fig. 3, obese were 119 (63%) and non-obese were 70 (37%). Ketoacidosis was found in 47 (25%) patients. (Fig.4)

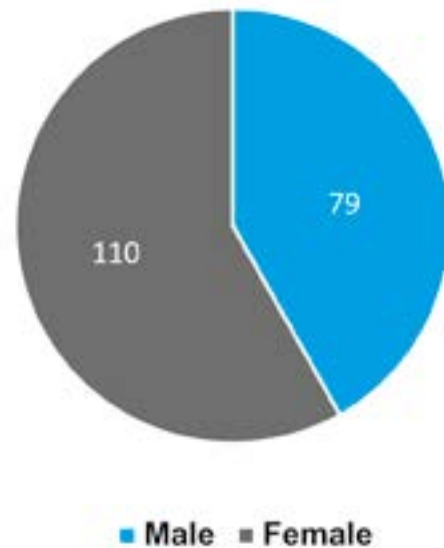


Fig-1. Frequency for gender

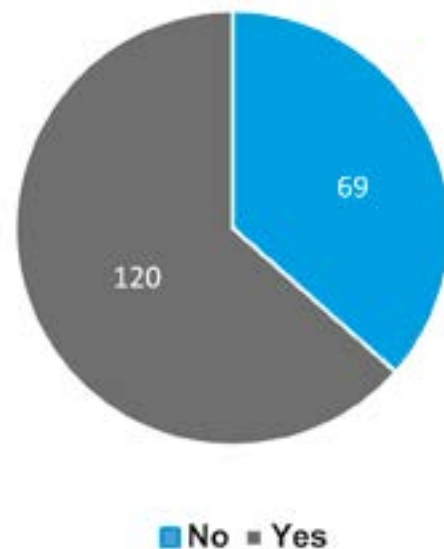


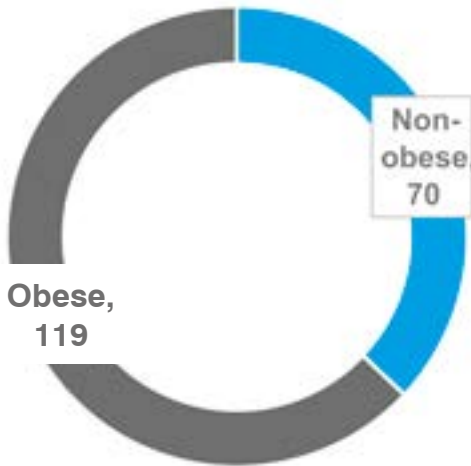
Fig-2. Frequencies for family history of diabetes mellitus

Patients were divided into two age groups, age group 35-50 years and age group 51-65 years. Age group 35-50 years consisted on 105 (55.56%) patients and Ketoacidosis was found in 27 (25.71%) patients. Among the 84 (44.44%) patients of age group 51-65 years, Ketoacidosis was found in 20 (11.9%) patients. Insignificant association was found between age and Ketoacidosis. P. value 0.865. (Table I) Stratification in relation to gender was done. Out of 79 (41.8%) male patients Ketoacidosis was

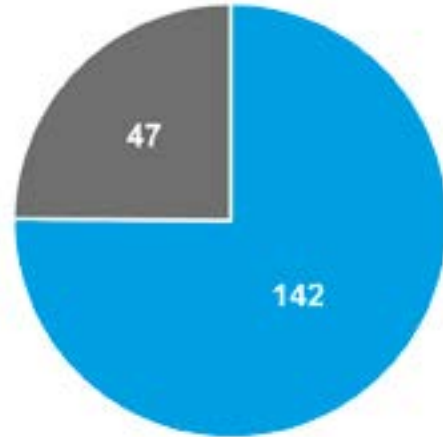
found in 21 (26.58%) patients. Among the 110 (58.2%) female patients, Ketoacidosis was found in 26 (23.64%) patients. Insignificant association between gender and Ketoacidosis was seen. P-value 0.733. (Table II)

Total 120 (63.49%) were present family history of

diabetes mellitus and Ketoacidosis was seen in 31 (25.83%) patients. Out of 69 (36.51%) patients without family history of diabetes mellitus, Ketoacidosis was seen in 16 (23.19%) patients. No association of family history of diabetes mellitus with Ketoacidosis was found. P. value 0.730. (Table III)



■ Non-obese ■ Obese
Fig-3. Frequency for obesity



■ No ■ Yes
Fig-4. Frequency for Ketoacidosis

Age Group	Ketoacidosis		Total	P. value
	Yes (%)	No (%)		
35-50	27 (25.71)	78 (74.29)	105 (55.56)	0.865
51-65	20 (11.9)	64 (76.1)	84 (44.44)	
Total	47 (24.87)	142 (75.13)	189	

Table-I. Stratification for age

Gender	Ketoacidosis		Total	P. value
	Yes (%)	No (%)		
Male	21 (26.58)	58 (73.42)	79 (41.8)	0.733
Female	26 (23.64)	84 (76.36)	110 (58.2)	
Total	47 (24.87)	142 (75.13)	189	

Table-II. Stratification for gender

Family History	Ketoacidosis		Total	P. value
	Yes (%)	No (%)		
Yes	31 (25.83)	89 (74.17)	120 (63.49)	0.730
No	16 (23.19)	53 (76.81)	69 (36.51)	
Total	47 (24.87)	142 (75.13)	189	

Table-III. Stratification for family history of diabetes mellitus

Obesity	Ketoacidosis		Total	P. value
	Yes (%)	No (%)		
Obese	29 (24.37)	90 (75.63)	119 (62.96)	0.863
Non-obese	18 (25.71)	52 (74.29)	70 (37.04)	
Total	47 (24.87)	142 (75.13)	189	

Table-IV. Stratification for obesity

As shown in table No. IV, out of 119 (62.96%) obese patients Ketoacidosis was found in 29 (24.37%) patients. Among the 70 (37.04%) non-obese patients, Ketoacidosis was seen in 18 (25.71%) patients. No relationship between obesity and Ketoacidosis was observed. P. value 0.863.

DISCUSSION

Hyperglycemia presents as DKA is the most common presentation in diabetics at emergency.⁸ It is fatal if untreated however mortality varies from 5 to 10 percent in different centers.⁹ No age is immune to it but it frequently occur in DM-I of younger age.¹⁰ Nausea, vomiting, abdominal pain and dehydration in semi-conscious and conscious patients with respiratory distress is the most common clinical presentation.¹¹ Biochemical markers are serum glucose >200mg/dl and ketonuria in a clinically suspected diabetics.¹² Pathophysiology of such state is due to absence of insulin, so tissues of the body do not take up glucose thus counter hormones such as glucagon and catecholamines increase the catabolism of lipid (triglyceride) into free fatty acids and thus increase gluconeogenesis for hyperglycemia. Free fatty acids lead to into ketonemia and ketonuria by beta oxidation.¹²

In our study mean age of the patients with DM-II was 50.09 ± 9.39 years, comparable mean age of the patients with DM-II was reported by Sheikh et al.⁸ Mean age of the patients with DM-II reported by Pinto et al¹³ in their study was 45±12 which is also in agreement with our study. In present study male patients was 42% and female patients were 58% which is comparable with a study by Sheikh et al,⁸ in his study male patients were 38.6% and female patients were 61.4%. Study of Habib is also in agreement with our study, he reported in his study male diabetics 41% and female diabetics 59%.¹⁴

In our study DKA was found in 25% patients. Ganie et al¹⁵ reported DKA in 20% patients. Findings of their study are comparable with our findings. But Sheikh et al found DKA in 14.3% patients which is not in agreement with our study.⁸ In another study, a higher proportion (41.7%) of patients with DKA was reported.¹⁶ Pitteloud et al¹⁷ reported diabetic ketoacidosis in 16% patients which is also comparable with our findings.

CONCLUSION

Results of this study showed that male or female can be equally victim of diabetic ketoacidosis. Diabetic ketoacidosis can be develop equally in younger or older age group. No significant difference for the development of diabetic ketoacidosis was found between obese/non-obese and patients with family history of diabetes or without family history of diabetes.

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

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PREVIOUS RELATED STUDY

Mohammad Mohsin Rana, Muhammad Saeed Akhtar, Muhammad Badar bashir, Abaid-ur-Rehman. TYPE 2 DIABETICS COMPONENTS OF THE METABOLIC SYNDROME (Original) Prof Med Jour 13(3) 453-459 Jul, Aug, Sep, 2006.

Mohammad Mohsin Rana, Muhammad Saeed Akhtar, Badar Bashir, Abaid-ur-Rehman. TYPE 2 DIABETICS; THE RELATIONSHIP BETWEEN THE SERUM CHOLESTEROL AND TRIGLYCEROLIDS (Original) Prof Med Jour 14(2) 337-343 Apr, May, Jun, 2007.

AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
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2	Dr. M. Arif Mahmood	Data collection and analysis	
3	Dr. Khalil Ahmad ³	Searching on internet and editing	