

Evaluation of Frequency of Diabetic Ketoacidosis and Presenting Symptoms in Patients of Diabetes Mellitus Presenting at Tertiary Care Hospital

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ABSTRACT

Objective: To evaluate the frequency of diabetic ketoacidosis and presenting symptoms in patients of diabetes mellitus presenting at tertiary care hospital.

Material and methods: In this cross sectional study total 145 patients of diabetes were selected from Department of Medicine from April 2020 to November 2020. Inclusion criteria was: un-controlled type II Diabetes Mellitus with HBA1c levels > 8, age between 30-70 years, male or female. Diabetic ketoacidosis was studied in selected patients.

Results: Mean age of the patients 49.80 ± 9.38 years. Out of 145 patients, ketoacidosis was found in 30 (21%) patients. Vomiting was the most common (88/60.69%) presenting symptom followed nausea in 59 (40.68%) patients, polyuria 50 (34.48%), polydipsia 41 (28.27%), abdominal pain 32 (22.07%), weight loss 16 (11.03%) and Polyphagia in 8 (5.52%) patients. Ketoacidosis was found in 15 (23.44%) male diabetics and 15 (18.52%) female diabetics. Association of ketoacidosis with gender was not significant ($P = 0.468$).

Conclusion: Findings of this study showed a higher rate of diabetic ketoacidosis. Vomiting was the most common presenting symptom. Most of the patients were between 30-50 years. No gender difference was found in development of diabetic ketoacidosis. Most of the patients of diabetic ketoacidosis had family history of diabetes.

Keywords: Ketone, Ketoacidosis, fasting serum glucose, diabetes mellitus, random serum glucose

INTRODUCTION

Acidosis, hyperglycemia and ketonemia (Ketonuria) are biochemical hallmarks for an acute diabetic complication known as Diabetic ketoacidosis.¹ Majority of diabetic patients below the age 20 years and 12% below the age 50 years have Diabetic ketoacidosis as a single largest cause of death.² Ketoacidosis have manifested among 20% of type 1 diabetic patients and 4% of overall diabetic patients.³ During severe intercurrent illness ketoacidosis can be precipitated in any age group of patients even though it mainly affects type 1 diabetic patients.⁴ Among the freshly diagnosed diabetic patients, there are around 10% having ketoacidosis.² Commonly precipitating factors for ketoacidosis are omission of insulin and infections like sepsis which makes diabetic ketoacidosis presenting in majority of patients.⁵ Clinical diagnosis leads to acidotic respiration, confusion or coma and dehydration and commonly received complaints of polydipsia, vomiting, polyuria and nausea.⁶ Statistically significant mean random blood glucose, osmolality and pH correlates with the neurological status of such patients.⁷ Severity of peripheral vascular insufficiency, severity of acidosis, comorbid conditions and duration of diabetic ketoacidosis prior to admission are some parameters for mortality.⁸

Purpose of this study was to evaluate the frequency of diabetic ketoacidosis and presenting symptoms. Results of this study may help us for early management of diabetic ketoacidosis and to reduce the morbidity related to it.

MATERIAL AND METHODS

In this cross sectional study total 145 patients of diabetes were selected from Department of Medicine from April 2020 to November 2020. Inclusion criteria was: un-controlled type II Diabetes Mellitus with HBA1c levels > 8, age between 30-70 years, male or female. History and demographic profile was taken and clinical assessment was done. Serum glucose levels >600mg, serum osmolality >310 mosm/kg, stroke patients, cases of hepatic encephalopathy were excluded. Ethical committee was approved this study and written informed consent was taken from every patient. Blood sample for blood pH, serum glucose levels and serum bicarbonate was taken and analyzed in Department of Pathology, Quaid-e-Azam Medical College, Bahawalpur. Ketones was also analyzed with fasting urine sample. All the data was noted on pre-designed proforma.

SPSS version 20 was used to analyze the collected data. Age was presented in form of Mean and SD. Diabetic ketoacidosis

(Yes/No), gender (Male/female) and family history (Yes/No) was presented in form of frequencies and percentages.

RESULTS

Mean age of the patients was 49.80 ± 9.38 years. Out of 145 patients, ketoacidosis was found in 30 (21%) patients. (Fig. 1) Vomiting was the most common (88/60.69%) presenting symptom followed by nausea in 59 (40.68%) patients, polyuria 50 (34.48%), polydipsia 41 (28.27%), abdominal pain 32 (22.07%), weight loss 16 (11.03%) and polyphagia in 8 (5.52%) patients. (Table 1) Two age groups 30-50 years and 51-70 years were created. Age group 30-50 years was consisted on 83 (57.24%) and age group 51-70 years was consisted on 62 (42.76%) patients. Ketoacidosis was noted in 20 (24.09%) patients and 10 (16.13%) patients respectively in age group 30-50 years and age group 51-70 years. Association of ketoacidosis with age group was not significant ($P = 0.241$). (Table 2) Male diabetics were 64 (44.14%) and female diabetics were 81 (55.86%). Ketoacidosis was found in 15 (23.44%) male diabetics and 15 (18.52%) female diabetics. Association of ketoacidosis with gender was not significant ($P = 0.468$). (Table 3) Total 96 (66.21%) patients found with family history of DM and 49 (33.79%) patients had no family history of DM. Ketoacidosis was noted in 21 (21.88%) patients with family history of DM and 9 (18.37%) patients without family history of DM. Association of ketoacidosis with family history was not significant ($P = 0.622$). (Table 4)

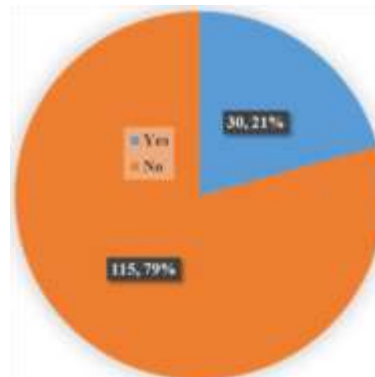


Fig. 1: Frequency of ketoacidosis

Table 1: Frequency of symptoms

Symptoms	N	%
Vomiting	88	60.69
Nausea	59	40.68
Polyuria	50	34.48
Polydipsia	41	28.27
Abdominal pain	32	22.07
Weight loss	16	11.03
Polyphagia	8	5.52

Table No. 2: Association of ketoacidosis with age group

Age Group	Ketoacidosis		Total	P. value
	Yes (%)	No (%)		
30-50	20 (24.09%)	63 (75.90%)	83 (57.24%)	0.241
51-70	10 (16.13%)	52 (83.87%)	62 (42.76%)	
Total	30 (21%)	115 (79%)	145	

Table No. 3: Association of ketoacidosis with gender

Gender	Ketoacidosis		Total	P. value
	Yes (%)	No (%)		
Male	15 (23.44%)	49 (76.56%)	64 (44.14%)	0.468
Female	15 (18.52%)	66 (81.48%)	81 (55.86%)	
Total	30 (21%)	115 (79%)	145	

Table No. 4: Stratification for family history of diabetes mellitus

Family History	Ketoacidosis		Total	P. value
	Yes (%)	No (%)		
Yes	21 (21.88%)	75 (78.13%)	96 (66.21%)	0.622
No	9 (18.37%)	40 (81.63%)	49 (33.79%)	
Total	30 (21%)	115 (79%)	145	

DISCUSSION

The objective of present study was to evaluate the frequency of diabetic ketoacidosis and presenting symptoms in patients of diabetes mellitus presenting at tertiary care hospital. Mean age of the patients was 49.80 ± 9.38 years. Two age groups 30-50 years and 51-70 years were created. Age group 30-50 years was consisted on 83 (57.24%) and age group 51-70 years was consisted on 62 (42.76%) patients. Ketoacidosis was noted in 20 (24.09%) patients and 10 (16.13%) patients respectively in age group 30-50 years and age group 51-70 years. Association of ketoacidosis with age group was not significant ($P = 0.241$). Most common age group was 30-50 years. Study by Pinto et al⁹ reported mean age of patients as 45 ± 12 . In study of Amadi et al,¹⁰ age range of diabetics was 23-46 years and mean age was 32.68 ± 5.91 years. Farogh et al¹¹ reported mean age of diabetics as 50.09 ± 9.39 years and most of the cases were between 30-50 years. In studies of Ganie et al¹² and Pitteloud et al¹³, 20% and 16% patients were found with ketoacidosis respectively. Farogh et al¹¹ reported frequency of diabetic ketoacidosis as 24.87%. Bedaso et al¹⁴ reviewed medical record of 195 diabetics and found ketoacidosis among 40% patients. Cherubini et al¹⁵ reported frequency of ketoacidosis among 40.3% diabetics. Duca et al¹⁶ reported frequency of ketoacidosis as 38.6%. In one study by Usher-Smith et al¹⁷ ketoacidosis was present in 18-22% diabetics. In study of Čačić et al¹⁸ diabetic ketoacidosis was noted in 34.4% patients. In our study vomiting was the most common (88/60.69%) presenting symptom followed by nausea in 59 (40.68%) patients, polyuria 50 (34.48%), polydipsia 41 (28.27%), abdominal pain 32 (22.07%), weight loss 16 (11.03%) and Polyphagia in 8 (5.52%) patients. In study of Amadi et al,¹⁰ Nausea/vomiting was present in 94.5% patients followed by polyuria 85.5% patients, polydipsia 71.7%, polyphagia 65.5%, weight loss 64.8% patients and abdominal pain in 55.2% patients. In study of Huri et al,¹⁹ vomiting was the most common (82.9%) presenting symptom followed by nausea in 56.2% patients, polyuria 32.4%, polydipsia 26.7%, abdominal pain 36.2% weight loss 11.4% and Polyphagia in 2.9% patients. In study of Ndebele et al²⁰ nausea and vomiting were the most common presenting symptoms. In our study male patients

were 64 (44.14%) and female patients were 81 (55.86%). Ketoacidosis was found in 15 (23.44%) male diabetics and 15 (18.52%) female diabetics. Insignificant ($P = 0.468$) association between ketoacidosis and gender was seen. Female proportion is higher than male. In study of Amadi et al,¹⁰ male and female patients were 51% and 49% respectively. In study of Sheikh et al,²¹ male and female patients were 38.6% and 61.4% respectively. Study of Habib et al²² male patients were 41% and female patients were 59%. In study of Farogh et al¹¹ male and female patients were 41.8% and 58.2% and total 26.58% male and 23.64% female patients were found with diabetic ketoacidosis. Total 96 (66.21%) patients found with family history of DM and 49 (33.79%) patients had no family history of DM. Ketoacidosis was noted in 21 (21.88%) patients with family history of DM and 9 (18.37%) patients found without family history DM. Association of ketoacidosis with family history was not significant ($P = 0.622$). In study of Amadi et al,¹⁰ 24.1% patients were found with history of DM and 52.4% patients were without family history of DM. Farogh et al¹¹ found 63.49% patients with family history of DM and 36.51% patients without family history of DM and diabetic ketoacidosis was found in 25.83% patients with family history of DM and in 23.19% patients without family history of DM.

CONCLUSION

Findings of this study showed a higher rate of diabetic ketoacidosis. Vomiting was the most common presenting symptom. Most of the patients were between 30-50 years. No gender difference was found in developing of diabetic ketoacidosis. Most of the patients of diabetic ketoacidosis had family history of diabetes.

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