ORIGINAL ARTICLE

Study of Diabetic Ketoacidosis in patients of Diabetes Mellitus

MIRZA SARMAD MAJEED, HAFIZ MUHAMMAD KALEEM ULLAH, MUHAMMAD USMAN

ABSTRACT

Aim: To study the diabetic ketoacidosis in patients of diabetes mellitus
Method: Total 150 patients presenting at Department of Medicine, Mayo Hospital, Lahore from Sep 2015 to March 2016, both male or female with age range from 35-65 years were selected for this cross sectional study for the investigation of diabetic ketoacidosis.
Results: Out of 150 diabetics, diabetic ketoacidosis was noted in 40(27%) patients. Total 84(56%) patients belonged to age group 35-50 years and 66(44%) patients belonged to age group 51-65 years. Male patients were 60(40%) and female patients were 90(60%). Obese were 80(53.33%) and non-obese were 70(46.67%). Total 85(56.67%) patients found with family history of DM
Conclusion: In present study, a higher number of diabetics were found with DKA. Insignificant association of DKA with age, gender and obesity was noted. DKA was significantly associated with family history of DM
Keywords: Diabetic ketoacidosis, diabetes mellitus, fastingserum glucose, random serum glucose.

INTRODUCTION

Diabetes mellitus is the most frequently occurring non-communicable chronic disorder.[1] Most of Diabetics live in south east Asia and that number is expected to increase at rate of 2% per year with rise of 69% people with diabetes in next 20 years[2]. The World Health Organization (WHO) estimates that approximately 300 million people will develop diabetes by 2025[3]. Prevalence is rapidly rising in developing countries of the world and will affect the people in their most productive years of life[4]. Pakistan is affected by this chronic illness with prevalence of around 8% and that is also expected to increase in near future as the diagnostics' facilities and awareness flourish among the public[5]. In diabetic patients diabetic ketoacidosis (DKA) is one of the most common complication[6]. DKA is a life threatening condition and its mortality rate is 1% to 10%[7].

The purpose of this study was to evaluate the rate of DKA in patients of DM. The results of this study may guide us for the early management of DKA and reduction in mortality and morbidity rate in such patients.

MATERIAL AND METHOD

This was a cross sectional study and conducted at Department of Medicine, Mayo Hospital, Lahore from Sep 2015 to March 2016.Total 150 patients of DM, both gender with age range from 35-65 years were selected. Patients having stroke, patients with serum glucose level >600mg/dl, plasma osmolality >310mosm/kg and patient hepatic encephlapthy were excluded from the study.

Family history of DM was taken and BMI of all the patients was calculated after measuring height and weight of all the patients. Five ml blood sample was taken and send to laboratory for serum glucose, serum bicarbonate and blood pH and urine was also taken for ketones. Demographic profile was also taken. All the data was noted on pre-designed profoma.

By using SPSS version 20, mean and SD was calculated for numerical data and frequencies and percentages was calculated for categorical data.

RESULTS

Total 150 type-II diabetics were included in present study. Mean age of the diabetics was 51.11±8.33 years. Diabetic ketoacidosis was found in 40(27%) patients (Fig. 1).

Patients were equally divided into two age groups, age group 35-50 years and age group 51-65 years. Total 84(56%) patients belonged to age group 35-50 years and 66(44%) patients belonged to age group 51-65 years and diabetic ketoacidosis was seen in 25(29.76%) patients and 15(22.73%) patients respectively in both age groups. Statistically insignificant (P=0.3583) association of diabetic ketoacidosis with age of the patients was noted (Table 1).

Male patients were 60(40%) and female patients were 90(60%) and diabetic ketoacidosis was noted in 12(20%) patients and 28 (31.11%) patients respectively. No association (P=0.1867) of diabetic ketoacidosis with gender was seen (Table 2).

House Officers, Department of Medicine, Mayo Hospital, Lahore
Correspondence to Dr. Mirza Sarmad Majeed Email: damrasmajeed01@yahoo.com, Cell: 03454579460

Total 85(56.67%) were found with family history of diabetes mellitus and Ketoacidosis was seen in 17(20%) patients. Out of 65 (43.33%) patients without family history of diabetes mellitus, Ketoacidosis was seen in 23(35.38%) patients. Significant association (P=0.0413) of family history of diabetes mellitus with Ketoacidosis was found (Table 3).

Fig. 1: Frequency for Ketoacidosis

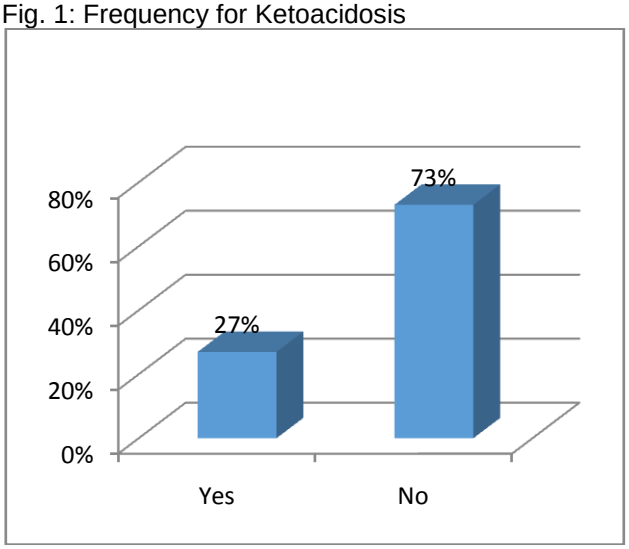

Table 1: Stratification for age

Age group	Diabetic Ketoacidosis		Total
	Yes	No	
35-50	25(29.76%)	59(70.24%)	84(56%)
51-65	15(22.73%)	51(77.27%)	66(44%)
Total	40(26.67%)	110(73.33%)	150

P value: 0.3583

Table 2: Stratification for gender

Gender	Diabetic Ketoacidosis		Total
	Yes	No	
Male	12(20%)	48(80%)	60(40%)
Female	28(31.11%)	62(68.89%)	90(60%)
Total	40(26.67%)	110(73.33%)	150

P value: 0.1867

Table 3: Stratification for family history of diabetes mellitus

Family H/O DM	Diabetic Ketoacidosis		Total
	Yes	No	
Male	17(20%)	68(80%)	85(56.67%)
Female	23(35.38%)	42(64.62%)	65(43.33%)
Total	40(26.67%)	110(73.33%)	150

P value: 0.0413

DISCUSSION

At emergency, DKA is one of the most common presentations in patients of DM[8]. It may cause death if not treated and its mortality rate varies from center to center[7]. DKA frequently occur in young individuals with DM-I[9]. The common clinical presentation of DKA are vomiting, nausea, pain in abdomen, dehydration and respiratory distress[10]. Biochemical markers of DKA are blood glucose level >200mg/dl and ketonuria in a clinically suspected diabetics[11].

In present study, average age of the diabetics was 50.09±9.39 years. Similar mean age was reported by Sheikh et al in their study[8]. In another study by Pinto et al[13] mean age of the type-II diabetics was 45±12 which is comparable with our study.

In our study males were 40% and females were 60%. Similar frequency of male (38.6%) and female (61.4%) diabetics was reported by Sheikh et al.[8]In study of Habib et al frequency of male diabetic patients were 41% and female diabetic patients were 59% which is also comparable with our study[12].

Diabetic ketoacidosis was found in 27% patients in our study. Ganie et al[13] reported frequency of DKA as 20% in type-II diabetics which is comparable with our study. In study of Pitteloud et al[14] frequency of DKA was 16% in diabetics. Sheikh et al[8] reported very low (14.3%) frequency of DKA in type II diabetics. But in one study, higher rate (41.7%) of DKA was reported.[15]

CONCLUSION

In present study, a higher number of diabetics was found with DKA. Insignificant association of DKA with age, gender and obesity was noted. DKA was significantly associated with family history of DM

REFERENCES

1. Olokoba AB, Obateru OA, Olokoba LB. Type 2 Diabetes Mellitus: A Review of Current Trends. Oman Med J. 2012 Jul;27(4):269–73.
2. Sicree R, Shaw J, Zimmet P, Heart BI. The global burden. Diabetes and impaired glucose tolerance Baker IDI Heart and Diabetes Institute [Internet]. 2010 [cited 2016 Dec 9]; Available from: http://blogimages.bloggen.be/diabetescheck/attach/34665.pdf.
3. Oliveira AF de, Valente JG, Leite I da C, Schramm JM de A, Azevedo ASR de, Gadelha AMJ. Global burden of disease attributable to diabetes mellitus in Brazil. Cadernos de SaúdePública. 2009 Jun;25(6):1234–44.
4. Mohan V, Madan Z, Jha R, Deepa R, Pradeepa R. Diabetes–social and economic perspectives in the new millenium. International journal of diabetes in developing countries. 2004;24(2):29–35.
5. WHO | Prevalence of diabetes and prediabetes and their risk factors among Bangladeshi adults: a

nationwide survey [Internet]. WHO. [cited 2016 Dec 9]. Available from: http://www.who.int/bulletin/volumes/92/3/13-128371/en/
6. Wolfsdorf J, Craig ME, Daneman D, Dunger D. Diabetic ketoacidosis. Pediatr Diabetes 2007;8:28-42.
7. Niaz Z, Rallaq A, Chaudhary UJ, Awais M, Yaseen MA, Naseer I, et al. Mortality review of diabetic ketoacidosis in Mayo Hospital, Lahore. Biomedica 2005;21:83-5.
8. Sheikh GA, Dilshad M, Khalid A. Frequency of diabetic ketoacidosis in diabetic patients. 2010 [cited 2014 Mar 25]; Available from: http://jumdc.tuf.edu.pk/articles/volume-2/no-2/JUMDC-5.pdf
9. Muir AB, Quisling RG and Yang MC. Cerebral edema in childhood diabetic ketoacidosis: natural history, radiographic findings and early identification. Diabetes Care 2004; 27:1541-6.
10. Lopez Vicente M, Ortega Gutierrz S, AmlieLefond C and Torbey MT. Diagnosis and management of pediatric arterial ischemic stroke. Journal of stroke and cerebrovascular diseases. 2010; 19:175-83.
11. Sharma V and Hadebe N. Diabetic ketoacidosis: principles of management. Br J Hosp Med (Lond) 2007; 68:184-9
12. Habib HS. Frequency and clinical characteristics of ketoacidosis at onset of childhood type 1 diabetes mellitus in Northwest Saudi Arabia. Saudi Med J. 2005 Dec;26(12):1936–9.
13. Ganie MA, Koul S, Razvi HA, Laway BA, Zargar AH. Hyperglycemic emergencies in Indian patients with diabetes mellitus on pilgrimage to Amarnathjiyatra. Indian J EndocrinolMetab. 2012 Mar;16 Suppl 1:S87–90.
14. Pitteloud N, Philippe J. Characteristics of Caucasian type 2 diabetic patients during ketoacidosis and at follow-up. Schweiz Med Wochenschr. 2000 Apr 22;130(16):576–82.
15. Edo AE. Clinical profile and outcomes of adult patients with hyperglycemic emergencies managed at a tertiary care hospital in Nigeria. Niger Med J. 2012 Jul;53(3):121–5.