



Prevalence of Diabetic Ketoacidosis (DKA) among Type 2 Diabetes Patients in Aliabad Hospital in 2018

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Abstract

Objective: Prevalence of DKA in patients with type 2 diabetes admitted to the internal service of Ali Abad Teaching Hospital.

Method and Material: The research was conducted through the descriptive method in cross-sectional form, which includes all patients who have been admitted to type 2 diabetes in the internal service of Aliabad Hospital for one year. In this study, all patients with type 2 diabetes are included, and type 1 diabetes is not included in this research.

Results: In this study, the prevalence of DKA in patients with type 2 diabetes was found to be 5.98 percent, which, from the perspective of gender, is most common in women (60 percent) and between the ages of 60 to 69 years.

Conclusion: Approximately 5.98 percent of hospitalized patients with diabetes mellitus type 2 had DKA; it was most common between the ages of 60-69 years, and was most common in women.

Keywords: type 2 diabetes, diabetic Ketoacidosis, Ketonemia

Introduction

Diabetic ketoacidosis (DKA) is the most common acute hyperglycemic emergency in people with diabetes mellitus. A diagnosis of DKA is confirmed when all three criteria are present: **D**, either elevated blood glucose levels or a family history of diabetes mellitus; **K**, the presence of high urinary or blood ketoacids; and **A**, a high anion gap metabolic acidosis [1]. Diabetic ketoacidosis (DKA) is an acute complication of diabetes. Its annual prevalence is approximately 4.6 to 8 cases per thousand diabetics. The DKA has posed a major economic challenge to the medical community, but since the discovery of insulin in 1920, the mortality from DKA has declined. Recently, the resulting mortality rate has reached 5-15% [2]. DKA is mainly found in people with type 1 diabetes, but it can also occur in people with type 2 diabetes who have severe illnesses. The incidence of DKA mortality increases with age and the presence of other associated comorbidities. A partial reduction or complete absence of insulin associated with increased ketabolic hormones exacerbates DKA, which in turn increases the production of glucose and ketobodies in the liver.

Literature review

A retrospective study conducted by Zhong, Juhaeri, and Mayer-Davis from 1997 to 2014 in England and published in the journal Diabetes Care Volume 41, September 2018, showed that the incidence of DKA has increased by 4.24% per year between 1998 and 2013 in type 2 diabetes mellitus [3].

A descriptive study conducted by Pradeep A Parvani and his colleagues from 2006 to 2012 in the Department of Endocrinology and Metabolism of the New Delhi Institute of Health Sciences in India on 1288 type 2 diabetes

patients and published in the journal Pediatr. Diabetes in 2021 shows that the prevalence of DKA in type 2 diabetes is 6.6% [4].

A descriptive study conducted by Ivan Kruljac and his colleagues for five years with 261,749 participants at the Zagreb University Teaching Hospital in Croatia and published in 2017 in the Journal of Endocrine Oncology and Metabolism shows that the prevalence of DKA in type 2 diabetes patients is 6.3 percent [5]. A descriptive study conducted by Dana Dabelea and his colleagues from 2002 to 2010 at the Department of Endocrinology at the University of Colorado, USA, and published on December 19, 2013, shows that the prevalence of DKA in type 2 diabetes has decreased from 11.7% in 2002-2003 to 5.7% in 2008-2010 [6].

A cross-sectional descriptive study conducted by Xiaofen Xiong and his colleagues from June 2017 to October 2019 on 894 type 2 diabetes patients and published in the journal BMJ Open in 2021 shows that the prevalence of DKA in type 2 diabetes patients is 3.9 percent [7].

A retrospective study conducted by Pimjai Anthanont and colleagues on type 2 diabetes patients from 2006 to 2010 at Thammasat Hospital in Thailand shows that the incidence of DKA was 4.67 percent over a five- year period [8].

Objective

To find out the prevalence of diabetic ketoacidosis (DKA) among patients with type 2 diabetes admitted to the internal service of Aliabad Hospital.

Questions

1. Is DKA the most common acute complication in hospitalized type 2 diabetes patients or not?
2. At what age is DKA more common in diabetic patients?
3. In which gender is DKA more common in diabetic patients?

Method

This research has been done using the descriptive cross- sectional method. By obtaining official permission from the honorable director of the Aliabad Teaching Hospital, the files of diabetic patients who were hospitalized in the inpatient service in 2018 were taken from the hospital's archive, and after collecting the desired information, they were again submitted to the hospital's archive. In this study, all patients admitted to type 2 diabetes in the internal medicine department of Aliabad Teaching Hospital in 2018 are included. All patients admitted to type 2 diabetes are included in this study, and patients with type 1 diabetes or those with incomplete files are not included.

Information and examinations have been used from the files of diabetic patients as materials. The information obtained from the files, such as age, sex, and associated comorbidities, was studied, and this information was arranged by SPSS software (IBM Statistics 23.0x86) and Excel. The

obtained results have been used in the discussion; defects have been identified, and necessary suggestions have been made in order to improve them.

Results

This descriptive cross-sectional research has been carried out for one year in the internal service of Aliabad Hospital with the participation of inpatients with type 2 diabetes. A total of 167 type 2 diabetes patients were hospitalized, including 10 patients with evidence of DKA, and the prevalence of DKA in type 2 diabetes patients in Aliabad Hospital is 5.98 percent. Most of its occurrences have been seen in the age group of 60-69 years old and among females. DKA is one of the most common acute complications of type 2 diabetes, which is associated with a percentage of 5.98.

DKA is one of the most common acute complications in type 2 diabetes patients, and its prevalence has increased with increasing age. Its highest incidence is seen in 60 to 69-year-olds.

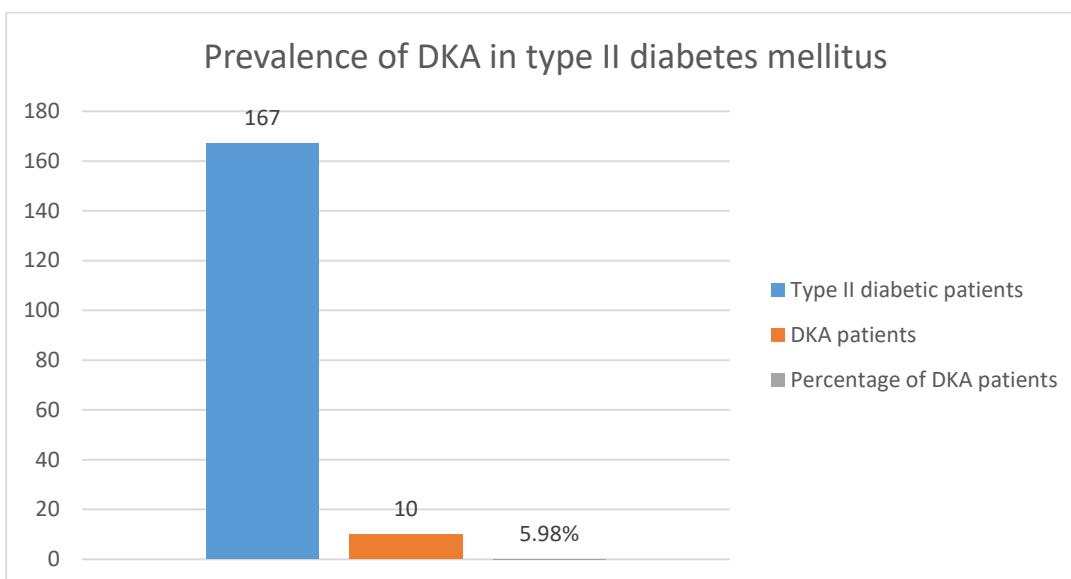


Chart 1 In this chart, it is shown that the total number of patients with type 2 diabetes was 167; among them, ten patients were diagnosed with DKA, which constitutes 5.98 percent.

Table 1 shows the percentage of occurrences according to gender and age categories. As it has been shown, the incidence of diabetic ketoacidosis is zero in people over seventy years old and between 20-29 years old, but between the ages of 60-69 years, its incidence is at its highest level (40 percent), half of which occurs in men and the other half in women. Between the ages of 50-59, its general incidence is 20% (half of it is seen in men and another half in women). Between the ages of 40-49, its general prevalence is 30% (in women, it is twice as much as in men). Between the ages of 30-39, the percentage of public incidents was 10 percent, which occurs all in women.

| Age | General percentage | Male percentage | Female percentage |
|-------|--------------------|-----------------|-------------------|
| < 70 | 0 | 0 | 0 |
| 60-69 | 40% | 20% | 20% |
| 50-59 | 20% | 10% | 10% |
| 40-49 | 30% | 10% | 20% |
| 30-39 | 10% | 0 | 10% |
| 20-29 | 0 | 0 | 0 |

In terms of gender, the percentage of DKA incidence is higher in hospitalized female patients with type 2 diabetes compared to men.

Gender relative prevalence of DKA

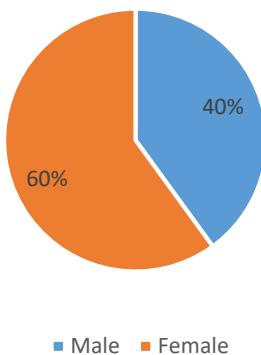


Chart 2 It shows the percentage of DKA occurrences according to gender, which indicates a higher percentage of occurrences in women than in men (40% of the total cases are men and 60% are women).

Discussion

As a result of research carried out in medical literature, the incidence of DKA among patients with type 2 diabetes in European countries has shown a reduction, which may be due to self-monitoring methods and improvements in the control of various infections, but in our country, compared to European countries and developed countries, the incidence is higher, which may be due to the low level of knowledge, the lack of advanced self-monitoring devices, and the lack of access to health clinics at the right time due to the low economic level [9] [3].

A descriptive study conducted by Ivan Kruljac and his colleagues for five years with 261,749 participants at the Zagreb University Teaching Hospital in Croatia and published in 2017 in the Journal of Endocrine Oncology and Metabolism shows that the prevalence of DKA in type 2 diabetes patients is 6.3 percentage, which is comparable to our data [5].

In a descriptive study conducted in India, the incidence of diabetic ketoacidosis was found to be 6.6%, which, according to our research, indicates that the number of occurrences is higher and the reason may be religious, cultural, and social differences [4].

In a study conducted at the University of Colorado in the United States of America, the incidence of DKA was 5.7%. According to our research, the incidence is lower, which may be due to better economic conditions and improvements in health care. But because its occurrences are closer to our research, some other situations, such as stress and adverse psychological conditions, may be involved in it [6].

According to Sarpong C et al., they investigated the prevalence of diabetes complications in developing countries and found that the prevalence of DKA in females is 5.7 percent and in males is 3.2 percent, which is therefore comparable with our data (60% in males vs 40% in females) [10], with similar data regarding gender by Sydney A et al [11].

Based on research conducted by O.M. Henriksen and his colleagues from 1996 to 2002 in Denmark and published in the journal Diabetes Research and Clinical Practice 76(2007) 51-56, the incidence of DKA is more prevalent in the age group of over 50 years, which is relatively comparable to our data (high prevalence between the ages of 60-69 years) [9]. But in the medical literature, we could not find any more information about the prevalence of DKA based on age.

Conclusion

Approximately 5.9 percent of type 2 diabetic patients who were admitted to the internal medicine unit of Aliabad Teaching Hospital had DKA, which is most common in the age group of 60 to 69 years and is more common in female patients.

Recommendation

- Necessary medical advice for the patient and the patient's follow-up is to control and regularly examine the blood glucose level and determine the ketone level in the urine.

- Understanding the ways to prevent factors that contribute to the patient's care
- Understanding the symptoms and signs of DKA to the patient, in case of suspicion, visit the doctor and health center on time.

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