Diabetic Ketoacidosis Treatment Outcomes and Associated Characteristics: Comparison between Type I and Type II Diabetes Mellitus

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ABSTRACT

Diabetic ketoacidosis (DKA) is a serious, life-threatening complication of both type I and type II diabetes mellitus (DM). Differences in the clinical presentation, severity (need for intensive care unit), treatment protocol, and general outcomes (hospital stay, mortality, and hospital costs) of DKA between type I and type II DM groups must be understood to establish a better approach to patient care and clinical outcomes, not only in general but based on specific patient characteristics. Unlike previous studies in which patients with type I and type II DM were studied as one population, this study was conducted to assess DKA outcomes and associated characteristics among patients with type I and type II DM at King Abdelaziz Medical City, Riyadh, Saudi Arabia. A 2017- 2022 retrospective cohort study of DKA in type I and type II diabetes was conducted at a tertiary hospital in Saudi Arabia. All DKA cases were included except those with incomplete medical charts or those <14 years of age. The data were then divided into two groups, type I and type II DM. Each dataset was analyzed using SAS version 9.4 (SAS Institution, Cary, North Carolina, USA). A total of 223 diabetic patients presented to ER with DKA were included in the study, comprising 166 (74.44%) patients with type I DM and 57 (25%.56%) with type II DM. Most of the type I DM group did not have other comorbidities, whereas in the type II DM group, 34 (59.65%) patients had hypertension, 31 (54.39%) had dyslipidemia, seven (12.28%) had chronic kidney disease, six (10.53%) had acute coronary syndrome, and six (10.53%) had heart failure. The frequency of recurrence of DKA per year and clinical presentation of DKA were mostly similar between the two groups. In The most common precipitating factor for DKA in the type I DM group was inappropriate insulin therapy in 87 (52.41%) patients, whereas that of the type II DM group was infection in 22 (38.60%) patients. 54 (32.53%) patients with type I DM required ICU admission, as compared to 17 (29.87%) patients with type II DM. Type I diabetics tended to require a hospital stay of >3 days at 89 (64.91%) patients, as compared to 37 (55.62%) patients with type I DM. Finally, the mortality rate was higher among the type II DM group compared to the type I DM group at three (5.26%) patients and one (0.60%) patient, respectively. The findings of this study demonstrate the importance of studying DKA populations in terms of DM type and creating an evidence-based approach for DKA treatment protocols based on individual patient characteristics. For example, patients who are at increased risk of volume overload such as heart failure, or hemodialysis patients require a special treatment protocol, different from that of the general population, in terms of fluid resuscitation. Understanding the unique characteristics of these populations will help to develop individualized treatment protocols, which will result in significant improvement in clinical outcomes, including decreases in hospital stay, costs, and mortality.

Keywords: diabetic ketoacidosis, type I diabetes mellitus, type II diabetes mellitus, clinical characteristic, hospital stay, cost, mortality, treatment protocol

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