

HYPOGLYCEMIA AMONG DIABETIC PATIENTS IN THE ACCIDENT AND EMERGENCY DEPARTMENT IN A SAUDI HOSPITAL

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Hypoglycemia is a serious condition which affects diabetic patients. Significant hypoglycemia carries with it not only emotional issues of anxiety and embarrassment for many diabetics, but also potentially serious related problems such as convulsions, coma, and even death.^{1,2} In recent years, lack of awareness of the symptoms of hypoglycemia has been increasingly recognized as an important factor behind the occurrence of severe hypoglycemia.^{3,4} In the recent Diabetes Control and Complication Trial (DCCT), severe hypoglycemia occurred three times more often in patients receiving a more intensive insulin regimen, sometimes without having any symptoms.⁵

Currently, there are about 5000 diabetic patients (of all types) followed up in the Security Forces Hospital (SFH), Riyadh, as this hospital is the major referral center for Ministry of Interior employees and their relatives.

The present study was undertaken to observe the pattern of severe hypoglycemia in diabetic patients attending the Accident and Emergency (A&E) room of SFH from 1994 to 1995, the possible underlying causes and contributory factors, and the possible role of diabetic education in this pattern.

Patients and Methods

Data was collected on all patients with hypoglycemia (blood glucose < 2.8 mmol/L) attending the A&E department at the Security Forces Hospital, from 1 May 1994 to 30 April 1995. All hospital laboratory results were input into the hospital computer system. Blood glucose levels were checked daily for hypoglycemia. Patients with hypoglycemia were interviewed by the diabetic nurse educator, and relevant clinical data recorded including age, type of diabetes, duration of disease, type of treatment, previous exposure to diabetic education, and possible etiological factors for the occurrence of hypoglycemia.

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Results

In the 12-month period of the study, 74,510 patients attended the A&E department, and 23 patients with hypoglycemia (11 males and 12 females) were identified. Only one of them attended the A&E department twice with hypoglycemic symptoms. Table 1 summarizes the age distribution of the hypoglycemic patients, with the majority aged between 50 and 70 years. Of the 23 patients, seven had insulin-dependent diabetes (IDDM), 15 had non-insulin-dependent diabetes (NIDDM), and one had gestational diabetes (GDM), which was treated with insulin. Twenty-one patients had symptomatic hypoglycemia (sweating, dizziness, hunger, palpitations and tremor). Of these, three developed symptoms in their sleep. In two patients, the hypoglycemia was apparently asymptomatic, as reported from the laboratory.

Four patients were on oral hypoglycemic agents (OHA, a sulfonylurea with or without metformin), while 19 patients (6 IDDM, 12 NIDDM and 1 GDM) were on insulin (mixed split regimen). Table 2 summarizes the contributory factors for the occurrence of hypoglycemia, the most common factor being related to missing meals or snacks. Of the 23 patients, 10 were sent home after recovery, while 13 (eight patients on insulin and five on OHA) were admitted.

Of the 23 patients, nine had received formal diabetic education from our diabetic educator nurse, while 14 had had no previous diabetic education. The mean blood sugar for patients who received diabetic education was 1.87 mmol/L, as compared to 1.73 mmol/L for those who had received no diabetic education. No neurological sequelae were observed in the 23 patients.

Discussion

The first observation to make is the relative infrequency of hypoglycemia in the diabetics seen in our A&E department, as compared to some other studies.^{6,7} This may possibly be due to some cases being managed at other conveniently located hospitals or dispensaries, or simply being managed at home. It is also possible that

TABLE 1. Characteristics of patients admitted to SFH with hypoglycemia.

	Number of patients
Age	
11-20	3
21-30	3
31-40	1
51-60	6
61-70	9
>70	1
M/F	11/12
Type of diabetes	
IDDM	7
NIDDM	15
GDM	1
Treatment	
Insulin	19
OHA	4

Hemoglobin A₁C=7.3±2.4%.

TABLE 2. Precipitating causes of hypoglycemia.

	Number of patients
Missing a meal	11
Large insulin dose	3
Missing a snack	3
Development of renal failure	2
Tight control in pregnant mothers	2
Early period in IDDM	2

patients treated at SFH, the majority of whom are NIDDM, are not very tightly controlled and, therefore, may not be at risk of developing hypoglycemia.

Our data confirms previous observations that missing meals and snacks is the most common cause of hypoglycemia.^{6,7} This may reflect inadequacy of diabetic education, as the majority of our hypoglycemic patients did not attend formal diabetic education sessions. It was also noted that elderly patients were more vulnerable to hypoglycemia. This is probably related to changes in their eating habits, and the possibility of improper timing of meals and snacks, as they may be dependent on others for their meals. It is also possible that some of the patients had other diseases or were taking medications such as beta blockers, thus increasing their vulnerability to hypoglycemia. In elderly diabetic patients, caution has to be exercised when prescribing long-acting oral hypoglycemic agents or intermediate-acting insulin. In these vulnerable patients, we feel that one may have to be satisfied with fasting blood glucose levels of 10-11 mmol/L. We have also observed that many patients may fast voluntarily on certain days, and also during religious occasions which require instructions similar to those made for Ramadan fasting.⁸

In this report, insulin was responsible for most hypoglycemia cases, as well as for the majority of hypoglycemia-related admissions. Chan et al. noted that admissions for hypoglycemia caused by insulin were less common than those produced by glibenclamide or chlorpropamide.⁹ We would like to recommend that all patients with hypoglycemia induced by sulfonylureas should be admitted for further evaluation and treatment. Other patients who should be admitted are those on insulin whose symptoms and signs of hypoglycemia do not clear up on treatment, and those whose etiology of hypoglycemia is not clearly understood, as well as patients with suspected sepsis, advanced liver disease, or suspected neoplasm.

It is evident that in this setting, the role of the diabetic educator cannot be overemphasized. Indeed, a careful study of the causes and contributing factors of hypoglycemia reveals that they are directly or indirectly related to the inadequacy or lack of application of the principles of diabetic education. At this time when there is a growing emphasis on the proper utilization of resources, many hypoglycemia-related admissions can be avoided if proper instructions are given to diabetic patients. Such instructions should concentrate on prevention, and on the treatment of symptoms and signs of hypoglycemia. Special groups of patients, such as the elderly, young IDDM patients with tight diabetic control, and patients with little knowledge of the symptoms of hypoglycemia, are particularly important.

Diabetic patients admitted to hospital for hypoglycemia or those discharged should receive proper dietary recommendations and specific therapeutic advice to avoid severe hypoglycemia.

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