Clinical Audit on Hypoglycemic Symptoms in Type 2 Diabetic Patients

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SUMMARY: Hypoglycaemia is an important complication in the treatment of type 2 diabetes mellitus, because it causes recurrent physical and psycho-social morbidity, and is sometimes fatal. The main objective of the study is to clinically audit the hypoglycaemic symptoms in type 2 diabetic patients in Jinnah Hospital, Lahore. This cross sectional clinical audit was done in Jinnah Hospital, Lahore during May 2020. The data was collected with the permission of ethical committee of hospital. The data was collected from type 2 diabetic patients who were enrolled during last 6 months in the hospital. We critically analyse the hypoglycemic symptoms of type 2 diabetic patients. The data was collected from 150 patients of Nishtar hospital, Multan for audit analysis. There were 70 males and 80 females. The age range was 40 to 70 years and the mean age was 58.95±5.67 for hypoglycaemic symptoms patients and 55.15±10.67 for without symptoms patients. It is concluded that hypoglycaemic symptoms are a common complication of diabetic treatment, and efforts should be focused especially on insulin-treated patients to prevent hypoglycaemia, including education on hypoglycaemia awareness, self-monitoring of blood glucose and dietary advice.

KEYWORDS: DM, Hypoglycemia, Outcomes, Patients.

INTRODUCTION

Hypoglycaemia is an important complication in the treatment of type 2 diabetes mellitus, because it causes recurrent physical and psycho-social morbidity, and is sometimes fatal. Achieving target glycaemic goals while avoiding hypoglycaemia is a major challenge in the management of patients with type 2 diabetes mellitus. Hypoglycaemia is the limiting factor in the glycaemic management of diabetes in the vast majority of people with diabetes[1].

In healthy individuals, blood glucose concentrations are maintained within a very narrow range, despite major fluctuations in glucose entry into the body and glucose utilization in tissue metabolism. In people with diabetes mellitus, inadequate insulin secretion results in high blood glucose concentrations. The treatment of diabetes mellitus focuses on avoidance of hyperglycaemia in order to avoid its associated symptoms and to minimize the risk of vascular complications over time[2].

Treatments that elevate insulin concentrations in the blood independent of the ambient glucose inevitably carry risk of intermittent hypoglycaemia. Episodes of hypoglycaemia are distressing, either because of the symptom response to the falling blood glucose concentration, or because of the alteration in brain function that occurs if the plasma glucose falls too low to sustain normal neuronal function[3]. Hypoglycaemia, particularly when severe, is associated with considerable cost, both to the individual and to the health service.

Most of the research into hypoglycaemia has used insulin-induced hypoglycaemia as a tool and has looked at hypoglycaemia in the insulin-deficient Type 1 diabetic population[4]. The occurrence of hypoglycaemia in the treatment of Type 2 diabetes is also well recognized, but is more protean in nature, having different risk factors and clinical features according to the nature of the hypoglycaemic therapy, the extent of the insulin secretory deficit and the duration of diabetes[5].

The global burden of type 2 diabetes (T2DM) is increasing, particularly, in economically developing countries. Epidemiological studies suggest that, without effective prevention and control programs, T2DM is likely to continue to increase globally. The United Arab Emirates (UAE), a country under developmental transition, has one of the highest prevalence of T2DM worldwide, with significant T2DM-relatedcomplications, and cost of treatment[6].

OBJECTIVES

The main objective of the study is to clinically audit the hypoglycemic symptoms in type 2 diabetic patients in Jinnah Hospital, Lahore.

STANDARDS

This audit mainly focus on a practical approach to systematically evaluate the quality of patient care, and identify treatment gaps between current practice and target goals. Of note is the level of glycemia, blood pressure (BP), and lipid profile, which plays a significant role in reducing macro- and micro-vascular complications, and improve quality of life. Moreover, patient satisfaction may enhance treatment compliance[7].

METHODS

This cross sectional clinical audit was done in Jinnah Hospital, Lahore during May 2020. The data was collected with the permission of ethical committee of hospital. The data was collected from type 2 diabetic patients who were enrolled during last 6 months in the hospital. We critically analyse the hypoglycemic symptoms of type 2 diabetic patients. Socio demographic data was collected from the hospital record. For this study purpose, we analyse the blood glucose levels, HbA1c, serum lipid profile and urea nitrogen of all the patients. The most common cause of hypoglycaemia in Type 2 diabetes, resulting in significant physical and psychosocial morbidity, is iatrogenic, occurring with the use of insulin secretagogues and insulin therapy.

Data collection tool

The data was collected through systematically designed questionnaire which include all the data related to hypoglycaemia, presence of hypoglycaemic symptoms including sweatiness/shivering/giddiness/hunger, frequency, time of day, relation to meals, patient's perception to cause, action taken, checking of glucose levels, as well as control including diet, exercise, oral medication, insulin, owning of a glucometer, and previous admissions for hypoglycaemia.

Statistical analysis

Data were coded and entered in Microsoft Excel 2017 and statistical analyses conducted using Stata version 10. Significance was accepted at $p < 0.05$ throughout.

RESULTS

The data was collected from 150 patients of Nishtar hospital, Multan for audit analysis. There were 70 males and 80 females. The age range was 40 to 70 years and the mean age was 58.95 ± 5.67 for hypoglycaemic symptoms patients and 55.15 ± 10.67 for without symptoms patients. There were 77 (77.1%) who checked the blood glucose concentration regularly and having symptoms of hypoglycaemia and almost 19 (38.1%) who checked the blood glucose regularly but not having the symptoms of hypoglycaemia.

Table 01: Demographic characteristics of selected patients

Variables	Hypoglycaemic symptoms N=100	Without symptoms N=50	P-values
Age	58.95±5.67	55.15±10.67	0.312
Gender Male Female	 30 70	 22 28	 0.061
Insulin treatment	77 (77.89%)	21 (42.98%)	0.001
Stratified According to Those on Insulin: own Glucometer yes No	 76 (75%) 24 (25%)	 23 (46%) 27 (54%)	 0.161

Frequency of Checking blood Sugar			
At least monthly			
Never to occasionally	77 (77.1%)	19 (38.1%)	0.159
	23 (22.9%)	31 (61.9%)	

Causes of hypoglycaemic symptoms were often meal related, including interval of meals, no night snack, insulin injection without food and non-compliance to diet. Other causes include previous non-compliance but now compliant to medication, acute illness, and poor understanding of diabetes mellitus, increased medication or insulin regime (table 02).

Table 02: Characteristics of subset of diabetic patients with hypoglycaemic symptoms.

Variables	Patients	% age
Has documented hypoglycaemia in the last 3 months		
Yes		
No	55	55.1%
	45	44.9%
Previous admission for hypoglycaemia		
Yes	32	33.2%
No	68	66.8%
Time of symptoms in relation to meals:		
Before breakfast	22	22%
Before lunch	15	15.1%
Before dinner	27	26.9%
Midnight	32	32.2
Others	4	3.8%
Causes of hypoglycemic symptoms according to assessment:		
Time interval of meals		
Acute illness	21	21%
Insulin injection without meal	16	16%
Increase medication	17	17.8%
No night meal	27	26.2%
Poor understanding of disease	12	11.9%
	7	6.1%
Frequency of symptoms:		
Once in a month	31	30.9%
Once in 3 months	27	27.1%
Twice in 3 months	21	21%
Once a week	18	17.4%
Others	3	3.6%

CONCLUSION

It is concluded that hypoglycaemic symptoms are a common complication of diabetic treatment, and efforts should be focused especially on insulin-treated patients to prevent hypoglycaemia, including education on hypoglycaemia awareness, self-monitoring of blood glucose and dietary advice.

RECOMMENDATIONS

It is recommended that an assessment tool, glucose-lowering therapies that are associated with hyperinsulinaemia that is not glucose dependent, such as the SUs and insulin, carry a risk for hypoglycaemia that is increased in older patients, those with longer duration

of diabetes, lesser insulin reserve and other comorbidities, including renal impairment, hypothyroidism and defects of counter regulatory hormone secretion. The risk may be greater in the drive for intensified therapy and strict glycaemic control. Severe hypoglycaemia also increases with increasing duration of Type 2 diabetes, and of insulin therapy, presumably as a result of increasing deficiency of endogenous, glucose-regulated insulin secretion, with rates of self-reported severe hypoglycaemia rising from 7 to 25% in those who have been taking insulin for > 5 years[8-9].

Action plan

Despite the several limitations, hypoglycaemia has a substantial clinical impact in terms of mortality, morbidity and quality of life. The cost implications of severe episodes, both direct hospital costs and indirect costs due to inability to work, are considerable. Perhaps more important, hypoglycaemia and fear of hypoglycaemia limit the ability of current diabetes medications to achieve and sustain the degree of glycaemic control predicted to prevent the increased risk of diabetic complications[10-11].

Re-audit

In addition to regular reviews of progress a second audit cycle should be completed be completed within 12 months of completing the first cycle.

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