

ORIGINAL RESEARCH

Clinical characterisation of severe hypoglycaemia in hospitalized patients

¹Dr. Abhijit A. Patil, ²Dr. Amit Porwal, ³Dr. Jabbar Desai

^{1,2,3}Assistant Professor, Department of General Medicine, Krishna Institute of Medical Sciences, Karad, Maharashtra, India

Correspondence:

Dr. Abhijit Patil

Assistant Professor, Department of General Medicine, Krishna Institute of Medical Sciences, Karad, Maharashtra, India

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ABSTRACT

Background: Hypoglycemia is an endocrine emergency that can alter the patient's mental status, resulting in lethargy, confusion and organ dysfunction. The present study was conducted to assess clinical characterisation of severe hypoglycaemia in hospitalized patients.

Materials & Methods: 74 patients presenting to emergency with hypoglycaemia of both genders were selected. Causes of hypoglycaemia were identified A blood glucose concentration was determined by Accu-Check Gluco-stix. Hypoglycaemia was defined as a capillary blood glucose of 70 mg/dL or less.

Results: Out of 74 patients, males were 34 and females were 40. The mean HGT was 42.5, pulse rate was 87.2 beats per minute, systolic blood pressure was 134.2 mm Hg, diastolic blood pressure was 80.6 mm Hg and GCS was 10.4. Common causes of hypoglycaemia were OHA in 34, OHA+ insulin in 12, insulin in 10, others in 6, skipped meal in 7 and alcohol in 5 cases. The difference was significant ($P < 0.05$). Common clinical features were anorexia in 45, fever in 68, syncope in 42 and others in 21. The difference was significant ($P < 0.05$).

Conclusion: Common causes of hypoglycaemia were OHA, OHA+ insulin, insulin, others, skipped meal and alcohol. Common clinical features were anorexia, fever, syncope and others.

Key words: Hypoglycemia, Insulin, Syncope

INTRODUCTION

Diabetes mellitus (DM) is a chronic disease, characterized by hyperglycemia due to insulin deficiency, insulin resistance, or both.¹ The relationship between the burden of hypoglycemia and hyperglycemia has been shifting and evolving.² Hypoglycemia is an endocrine emergency that can alter the patient's mental status, resulting in lethargy, confusion and organ dysfunction.³ Common causes are lack of adequate intake of food, chronic alcohol abuse, interactions among medications, increased physical exertion and overdose of medications (insulin/oral hypoglycemic agent).^{4,5}

A rise in deaths due to diabetes has been attributed to patients experiencing severe hypoglycemia in comparison to those not experiencing severe hypoglycemia. Repeated episodes of hypoglycemia can lead to impairment of the counter-regulatory system with the potential for development of hypoglycemia unawareness.⁶ The short- and long-term complications of diabetes related hypoglycemia include precipitation of acute

cerebrovascular disease, myocardial infarction, neurocognitive dysfunction, retinal cell death and loss of vision in addition to health-related quality of life issues pertaining to sleep, driving, employment, recreational activities involving exercise and travel.⁷The present study was conducted to assess clinical characterisation of severe hypoglycaemia in hospitalized patients.

MATERIALS & METHODS

This study consisted of 74 patients presenting to emergency with hypoglycaemia of both genders. All were enrolled with the written consent.

Data such as name, age, gender etc. was recorded. Causes of hypoglycaemia were identified. A blood glucose concentration was determined by Accu-Check Gluco-stix. Hypoglycaemia was defined as a capillary blood glucose of 70 mg/dL or less. Results were tabulated and assessed statistically. P value less than 0.05 was considered statistically significant.

RESULTS

Table I Distribution of patients

Total- 74		
Gender	Males	Females
Number	34	40

Table I shows that out of 74 patients, males were 34 and females were 40.

Table II Patient characteristics

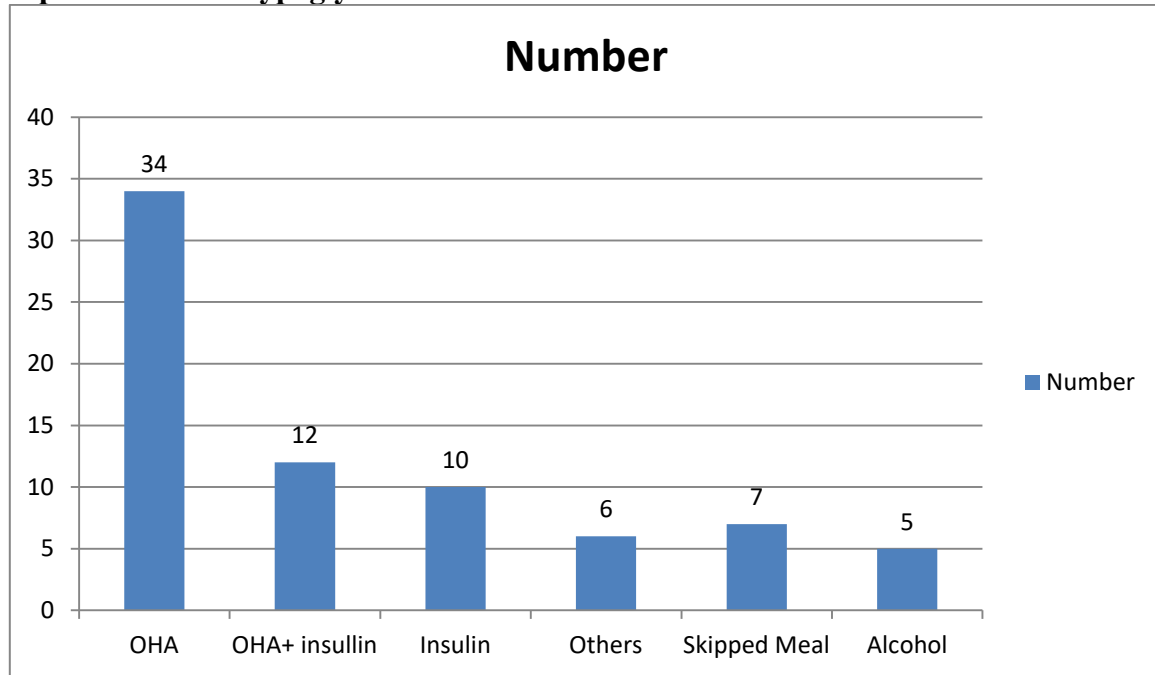
Parameters	Mean	SD
HGT	42.5	5.6
Pulse	87.2	8.2
SBP	134.2	12.5
DBP	80.6	7.2
GCS	10.4	2.6

Table II shows that mean HGT was 42.5, pulse rate was 87.2 beats per minute, systolic blood pressure was 134.2 mm Hg, diastolic blood pressure was 80.6 mm Hg and GCS was 10.4.

Table III Causes of hypoglycaemia

Causes	Number	P value
OHA	34	0.05
OHA+ insullin	12	
Insulin	10	
Others	6	
Skipped Meal	7	
Alcohol	5	

Table III, graph I shows that common causes of hypoglycaemia were OHA in 34, OHA+ insulin in 12, insulin in 10, others in 6, skipped meal in 7 and alcohol in 5 cases. The difference was significant ($P < 0.05$).

Graph I Causes of hypoglycaemia**Table IV Assessment of clinical features**

Features	Number	P value
Anorexia	45	0.05
Fever	68	
Syncope	42	
Others	21	

Table IV shows that common clinical features were anorexia in 45, fever in 68, syncope in 42 and others in 21. The difference was significant ($P < 0.05$).

DISCUSSION

Hypoglycemia presents with a variety of symptoms ranging from impaired cognitive function to convulsions, coma and death.^{8,9} Whilst the consequences of untreated hypoglycemia are well documented the true frequency of presentation of hypoglycemia for both diabetic and non-diabetic subjects is still unclear.^{10,11} Reasons for this uncertainty may be due to one of several of the following; the numerous precipitating factors; the protean clinical features and the varied location of presentation and treatment such as hospital, general practice or home. Differences between urban and rural populations may also be a factor.¹²

Interesting finding is sharp increase in severe hypoglycemia after 2007. There is a need for a nationwide survey investigating if there have been changes in glycaemic control status, anti-diabetic therapy, and diabetes education in type 2 diabetes mellitus subjects in recent years in order to draw any firm conclusion regarding the cause of this trend.¹³ The present study was conducted to assess clinical characterisation of severe hypoglycaemia in hospitalized patients.

We found that out of 74 patients, males were 34 and females were 40. Alao et al¹⁴ estimated the proportion hypoglycemic/hyperglycemic emergency episodes in treated diabetes mellitus (DM) patients admitted to a hospital ward. There were 646 ward admissions due to hyperglycemic emergencies and 176 hypoglycemic episodes with a ratio hypoglycemia/hyperglycemia 0.27 for all DM patients. In T2DM patients the ratio was 0.38. These were mainly female (55.1%), functionally dependent (61.4%) and retired/disabled (73.1%). Median age was 75 years and median duration of disease 11 years. Half the patients

were on insulin-based therapy and 30.1% on secretagogue based therapy. Approximately 57% of patients needed occasional/full assistance to manage the disease. The most frequent risk factor for hypoglycemia was polypharmacy (85.0%). Hypoglycemia in the 12 months before admission was higher in insulin-based therapy patients.

We observed that mean HGT was 42.5, pulse rate was 87.2 beats per minute, systolic blood pressure was 134.2 mm Hg, diastolic blood pressure was 80.6 mm Hg and GCS was 10.4. We found that common causes of hypoglycaemia were OHA in 34, OHA+ insulin in 12, insulin in 10, others in 6, skipped meal in 7 and alcohol in 5 cases. Kim et al¹⁵ in their study a total of 740 cases of severe hypoglycemia were identified. The mean subject age was 69±12 years, mean duration of diabetes was 13.8±9.3 years, and 53.2% of subjects were receiving insulin therapy. They observed a sharp rise in the number of cases between 2006 and 2007. Stages 3-5 chronic kidney disease was diagnosed in 31.5% of subjects, and low C-peptide levels (<0.6 ng/mL) were found in 25.5%. The mean subject age, duration of diabetes, HbA1c level, and renal and insulin secretory function values did not change significantly during the study period. The proportion of glimepiride use increased, while use of gliclazide decreased among sulfonylurea users. Use of insulin analogues increased, while use of NPH/RI decreased among insulin users.

Leese et al¹⁶ have demonstrated that severe hypoglycemia requiring emergency treatment is common among older adult subjects, and that age was a risk factor for severe hypoglycaemia. Johnson et al¹⁷ showed that older subjects experience a lower incidence of hypoglycemia after investigating the frequency of severe hypoglycemia among subjects receiving insulin monotherapy.

CONCLUSION

Authors found that common causes of hypoglycaemia were OHA, OHA+ insulin, insulin, others, skipped meal and alcohol. Common clinical features were anorexia, fever, syncope and others.

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