

Original Research

Clinical profile of hypoglycemia in the emergency department

¹Anurag Srivastava, ²Sanchika Gupta

¹Assistant Professor, Department of General Medicine, Gauri Devi Institute of Medical Sciences, Durgapur, West Bengal, India;

²Assistant Professor, Department of Dermatology, Gauri Devi Institute of Medical Sciences, Durgapur, West Bengal, India

ABSTRACT:

Background: Hypoglycemia is one among leading causes for emergency department (ED) visits. The present study was conducted to assess clinical profile of hypoglycemic patients in emergency department. **Materials & Methods:** 86 patients of hypoglycaemia of both genders were included. Assessment of blood glucose concentration was determined by Accu-Check Gluco-stix. **Results:** The mean age was 63.1 years, HGT was 42.2, pulse was 89.2 beats per minute, systolic blood pressure was 134.5 mm Hg, diastolic blood pressure was 78.2 mm Hg and GCS was 10.1. Common symptoms were anorexia in 34, fever in 38, LOC in 55, fall in 32, AMS in 16, FND in 4, syncope in 7 and others in 2 cases. Common causes were OHA in 40, OHA+ insulin in 22, insulin in 6, others in 4, skipped meal in 8 and alcohol in 2 cases. The difference was significant ($P < 0.05$). **Conclusion:** Hypoglycemia both in association with insulin treatment and with non-insulin glucose-lowering drugs, when severe enough to justify attendance to EDs, represents a remarkable burden for individuals with diabetes, increasing the risk of serious events and adverse outcomes.

Key words: Hypoglycemia, Insulin, Emergency

Received: 19 December, 2018

Accepted: 22 January, 2019

Corresponding author: Sanchika Gupta, Assistant Professor, Department of Dermatology, Gauri Devi Institute of Medical Sciences, Durgapur, West Bengal, India

This article may be cited as: Srivastava A, Gupta S. Clinical profile of hypoglycemia in the emergency department. J Adv Med Dent Sci Res 2019; 7(2): 238-241.

INTRODUCTION

Hypoglycemia is one among leading causes for emergency department (ED) visits. It is also the most common and easily preventable endocrine emergency. With increasing incidence of diabetes and with various modalities of intensive control of blood glucose levels, there is always a risk of a proportional increase in the incidence of hypoglycemia. As prolonged duration of hypoglycemia may lead to significant morbidity and even mortality, each hypoglycemic episode should be addressed accurately in the aspects of etiological diagnosis and preventive measures.¹

Other etiologies of hypoglycemia include old age, infection, chronic renal insufficiency, liver diseases and recurrent hypoglycemic episodes.² It presents with a variety of symptoms ranging from impaired cognitive function to convulsions, coma and death. 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. 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.³

Repeated episodes of hypoglycemia can lead to impairment of the counter-regulatory system with the potential for development of hypoglycemia unawareness.^{4,5} 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.⁶ The present study was conducted to assess clinical profile of hypoglycemic patients in emergency department.

MATERIALS & METHODS

The present study comprised of 86 patients of hypoglycaemia of both genders. A written consent was obtained before starting the study.

Data such as name, age, sex etc. was recorded. Assessment of blood glucose concentration was determined by Accu-Check Gluco-stix. Hypoglycaemia was defined as a capillary blood glucose of 70 mg/dL or less. After appropriate

treatment of the hypoglycaemic episode detailing whether the patient was sent home, or was admitted was also recorded. Results were studied statistically. P value less than 0.05 was considered statistically significant.

RESULTS

Table I Patient Characteristics

Parameters	Mean	SD
Age	63.1	13.099
HGT/RBS	42.2	14.571
Pulse	89.2	15.942
BP- Systolic	134.5	24.218
BP- Diastolic	78.2	11.653
GCS	10.1	3.725

Table I shows that mean age was 63.1 years, HGT was 42.2, pulse was 89.2 beats per minute, systolic blood pressure was 134.5 mm Hg, diastolic blood pressure was 78.2 mm Hg and GCS was 10.1.

Table II Assessment of clinical features

Clinical features	Count	P value
Anorexia	34	0.05
Fever	38	
LOC	55	
Fall	32	
AMS	16	
FND	4	
Syncope	7	
Others	2	

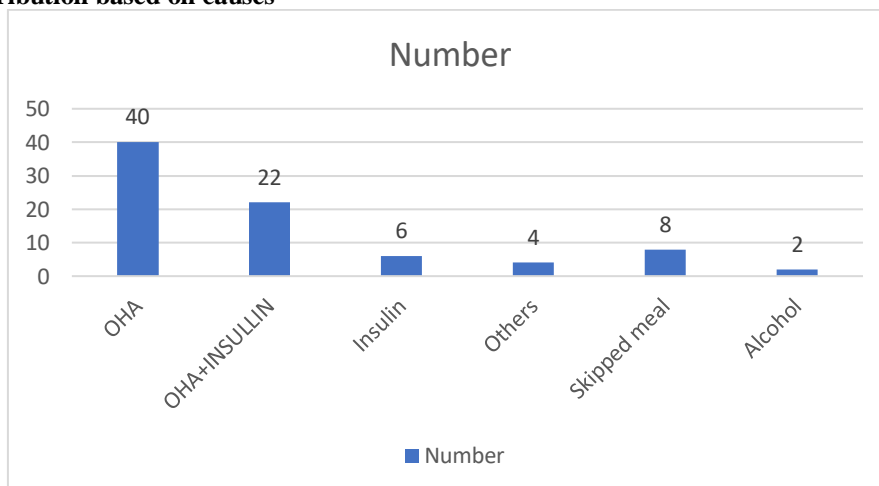
Table II shows that common symptoms were anorexia in 34, fever in 38, LOC in 55, fall in 32, AMS in 16, FND in 4, syncope in 7 and others in 2 cases.

Table III Distribution based on causes

Causes	Number	P value
OHA	40	0.01
OHA+INSULLIN	22	
Insulin	6	
Others	4	
Skipped meal	8	
Alcohol	2	

Table III shows that common causes were OHA in 40, OHA+ insulin in 22, insulin in 6, others in 4, skipped meal in 8 and alcohol in 2 cases. The difference was significant (P< 0.05).

Graph I Distribution based on causes



DISCUSSION

Hypoglycemia is an endocrine emergency that can alter the patient's mental status, resulting in lethargy, confusion and organ dysfunction.⁷ 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).^{8,9}

The incidence of severe hypoglycemia (SH) varied from 0.038 to 3.2 episodes per patient per year in patients with type 1 diabetes mellitus (DM) and from 0.0004 to 0.96 episodes per patient per year in patients with type 2 DM.¹⁰ Mild hypoglycemia is characterized by unpleasant autonomic and neuroglycopenic symptoms. SH is usually defined as an episode requiring the assistance of another individual for recovery.¹¹ Causes include drugs, endocrine disorders, malignancies, malnutrition, and renal insufficiency, etc., However, hypoglycemic agents used in DM are the most common cause of hypoglycemia. The causes of hypoglycemia may also depend on the medical facilities in the region, and on the sociocultural and economic status of the population.^{12,13} The present study was conducted to assess clinical profile of hypoglycemic patients in emergency department.

We found that mean age was 63.1 years, HGT was 42.2, pulse was 89.2 beats per minute, systolic blood pressure was 134.5 mm Hg, diastolic blood pressure was 78.2 mm Hg and GCS was 10.1. Kumar et al¹⁴ assessed the incidence and elucidating the underlying causes of hypoglycemia. A total of 1196 hypoglycemic episodes encountered at the ED during the study period were included, and of which 772 with complete data were analyzed. Underlying causes for hypoglycemia in the diabetic group (535) mainly included medication related 320 (59.81%), infections 108 (20.19%), and chronic kidney disease 61 (11.40%). Common underlying causes of hypoglycemia in nondiabetic group (237, 30.69%) included infections 107 (45.15%), acute/chronic liver disease 42 (17.72%), and malignancies 22 (9.28%). Among diabetic subjects on antidiabetic medications (n = 320), distribution over 24 h duration clearly reported two peaks at 8th and 21st h. The incidence of hypoglycemia and death per 1000 ED visits were 16.41 and 0.73 in 2011, 16.19 and 0.78 in 2012, 17.20 and 1.22 in 2013 with an average of 16.51 and 0.91, respectively.

We observed that common symptoms were anorexia in 34, fever in 38, LOC in 55, fall in 32, AMS in 16, FND in 4, syncope in 7 and others in 2 cases. Krnacova et al¹⁵ showed that most hypoglycemic episodes were experienced by patients between 2 pm and 6 pm.

We found that common causes were OHA in 40, OHA+ insulin in 22, insulin in 6, others in 4, skipped meal in 8 and alcohol in 2 cases. Feher et al reported missed meal as the predominant cause of hypoglycemia. In nondiabetic hypoglycemia attacks, Feher¹⁶ reported hypoglycemia mainly due to

infections, liver and kidney disease, and malignancy. Su et al¹⁷ reported the incidence of hypoglycemia as 37.5/1000 patients in overall emergency ambulance calls. Overall incidence in this study was 16.51/1000 ED visits (1196 hypoglycemic episodes among 72,428 ED visits).

CONCLUSION

Authors found that hypoglycemia, both in association with insulin treatment and with non-insulin glucose-lowering drugs, when severe enough to justify attendance to EDs, represents a remarkable burden for individuals with diabetes, increasing the risk of serious events and adverse outcomes.

REFERENCES

1. Kalra S, Mukherjee JJ, Venkataraman S, Bantwal G, Shaikh S, Saboo B, et al. Hypoglycemia: The neglected complication. *Indian J Endocr Metab* 2013;17:819-34.
2. Su CC. Etiologies of acute hypoglycemia in a Taiwanese hospital emergency department. *J Emerg Med* 2006; 30(3):259-261.
3. G. Marchesini et al. The management of severe hypoglycemia by the emergency system: The HYPOTHESIS study. *Nutrition, Metabolism & Cardiovascular Diseases* 2014; 24, 1181-1188.
4. Leese GP, Wang J, Broomhall J, Kelly P, Marsden A, Morrison W, et al. Frequency of severe hypoglycemia requiring emergency treatment in type 1 and type 2 diabetes: a population-based study of health service resource use. *Diabetes Care* 2003; 26(4): 1176-1180.
5. Adit Ginde, Janice Espinola, et. al. Trends and Disparities in US Emergency Department Visits for Hypoglycemia, 1993-2005. *Diabetes Care (DIABETES CARE)*, Mar2008; 31(3): 511-513. (3p)
6. Lin YY, Hsu CW, Sheu WH, Chu SJ, Wu CP, Tsai SH. Risk factors for recurrent hypoglycemia in hospitalized diabetic patients admitted for severe hypoglycemia. *Yonsei Med J* 2010; 51(3): 367-374.
7. Arinzon Z, Fidelman Z, Berner YN, Adunsky A. Infection-related hypoglycemia in institutionalized demented patients: a comparative study of diabetic and nondiabetic patients. *Arch Gerontol Geriatr* 2007; 45(2): 191-200.
8. Shorr RI, Ray WA, Daugherty JR, Griffin MR. Incidence and risk factors for serious hypoglycemia in older persons using insulin or sulfonylureas. *Arch Intern Med* 1997;157(15): 1681-1686.
9. Waeschle RM, Moerer O, Hilgers R, Herrmann P, Neumann P, Quintel M. The impact of the severity of sepsis on the risk of hypoglycaemia and glycaemic variability. *Crit Care* 2008; 12(5): R129.
10. Miller SI, Wallace RJ Jr, Musher DM, Septimus EJ, Kohl S, Baughn RE. Hypoglycemia as a manifestation of sepsis. *Am J Med* 1980; 68(5): 649-654.
11. Holstein A, Plaschke A, Egberts EH. Clinical characterisation of severe hypoglycaemia-a prospective population-based study. *Exp Clin Endocrinol Diabetes* 2003; 111(6): 364-369.
12. Gitt AK, Bramlage P, Binz C, Krekler M, Plate T, Deeg E, et al. Hypoglycaemia is more frequent in type 2 diabetic patients with co-morbid vascular disease: an analysis of the DiaRegis registry. *Eur J Prev Cardiol* 2012; 19(4): 765-772.

13. Ha WC, Oh SJ, Kim JH, Lee JM, Chang SA, Sohn TS, et al. Severe hypoglycemia is a serious complication and becoming an economic burden in diabetes. *Diabetes Metab J* 2012; 36(4): 280-284.
14. Kumar JG, Abhilash KP, Saya RP, Tadipaneni N, Bose JM. A retrospective study on epidemiology of hypoglycemia in Emergency Department. *Indian Journal of Endocrinology and Metabolism*. 2017 Jan;21(1):119.
15. Krnacova V, Kubena A, Macek K, Bezdek M, Smahelova A, Vlcek J. Severe hypoglycaemia requiring the assistance of emergency medical services—Frequency, causes and symptoms. *Biomed Pap Med Fac Univ Palacky Olomouc Czech Repub*. 2012;156:271–7.
16. Feher MD, Grout P, Kennedy A, Elkeles RS, Touquet R. Hypoglycaemia in an inner-city accident and emergency department: A 12-month survey. *Arch Emerg Med*. 1989;6:183–8.
17. Su CC. Etiologies of acute hypoglycemia in a Taiwanese hospital emergency department. *J Emerg Med*. 2006;30:259–61.