

A Tertiary Care Hospital Based Study on Knowledge and Attitude of Diabetic Patients Towards Hypoglycaemia

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Abstract:

Introduction: Hypoglycaemia among Diabetics is one of the acute complications that can increase morbidity and mortality of patients if not corrected in time. Having good knowledge on hypoglycaemia is a must for better management of Diabetes Mellitus.

Aim: To assess the knowledge and attitude towards hypoglycaemia in diabetic patients.

Material and Methods: Diabetic patients over 3 months duration (1st October 2019 to 31st December 2019), were included in the study and were given a questionnaire which had questions on demographic profile of patient, associated co-morbidities, their knowledge on symptoms, precipitating factors and remedial measures of hypoglycaemia.

Results: We had 130 patients for the study which showed a female predominance (59.3%, n=77). Maximum cases (49.2%, n=64) were in the age group 61-80 years. Patients considered dizziness (70%, n=91), weakness (69.2%, n=90) as the common symptoms of hypoglycaemia. Inadequate/delayed food was commonest (50%, n=65) selected option that could precipitate hypoglycaemia and consulting a doctor (77.6%, n=101) and timely food (66.1%, n=86) was preferred action considered by them. We found 78.5% (n=102) patients with good knowledge that was significantly associated with younger age, good socioeconomic status, literacy and comorbid conditions. There was poor compliance by 40.2% (n=41) of them due to many factors.

Conclusion: Despite possessing good knowledge on hypoglycaemia many patients lack the dedication to adopt it in their lifestyle keeping them at potential risk of hypoglycaemia. So, it is necessary to regularly reinforce them to follow the advice that can obviate a serious level of hypoglycaemia.

Key words: Diabetic, hypoglycaemia, knowledge, OHA

Date of Submission: 28-08-2020

Date of Acceptance: 11-09-2020

I. Introduction

Diabetes Mellitus is a major health issue with many acute and chronic complications. The total number of adults with type 2 diabetes is expected to rise by more than a fifth from 406 million in 2018 to 511 million in 2030. Maximum will be in China (130 million) followed by India (98 million). Amongst various complications of diabetes mellitus, hypoglycaemia is the one seen frequently. There are many causes of hypoglycaemia like insulin, some oral antidiabetics, critical illness, alcohol, cortisol deficiency and insulinomas. Hypoglycaemia is a strong obstacle in achieving good glycaemic control as it increases morbidity, mortality, length of stay and overall financial burden. Hypoglycaemia is often unpredictable and recurrent resulting in potentially severe physical and psychosocial morbidity, as well as associated economic burden.^[1,2,3,4] Hypoglycaemia can also be life-threatening, accounting for 6%–10% of all diabetes-related mortalities.^[5] Therefore, it is very necessary to make the patients and health care staff aware of early detection of hypoglycaemia, its home and hospital management and most importantly its prevention.

Hypoglycaemic episodes may manifest in different ranges from asymptomatic to severe neurological symptoms, like dizziness, confusion, weakness and loss of consciousness.^[6,7] Patients who develop symptoms of hypoglycaemia without awareness, may have sudden cardiovascular or other events.

The remedial actions by patients can be in various forms like oral glucose, milk, candies, biscuits or food. It has been seen that patients can have hypoglycaemia even in the background of good awareness on hypoglycaemia due to work pressure, non-availability of resources or poor compliance to routine that needs to be maintained. This study aims to find out the level of awareness about hypoglycaemia amongst diabetic patients so that we can predict the potential risk of hypoglycaemia.

II. Materials and Methods

Study design: This was a descriptive analytical study. All selected patients were given a questionnaire on the topic and multiple answers were allowed. The collected data included information about patient's demographic profile, their socioeconomic status, comorbidities, antidiabetic medications, awareness on hypoglycaemia, previous episode of hypoglycaemia, corrective and preventive actions taken. The socioeconomic status was calculated as per Prasad's classification with CPI (IW) -325 in November 2019. The patient who knew at least three symptoms of hypoglycaemia together with at least one precipitating factor and at least one remedial measure was thought to be having good knowledge.

Location: Patients visiting outdoors and those admitted indoors of Tata Main Hospital, Jamshedpur, India

Sample size: Out of 237 patients, we excluded 107 patients based on said criteria and the remaining 130 patients were included after proper consent.

Duration: 1st October 2019 to 31st December 2019

Inclusion criteria-

Age >18 years

Duration of diagnosis of diabetes > 1year

Exclusion criteria-

Age < 18 years

Neuropsychiatric illness

Gestational diabetes

Newly detected diabetics (less than one years)

Critically ill patients

Statistical analysis: We have used Microsoft excel and *p*-value (significant at <0.05) was calculated using Chi-square test.

III. Results

Out of total 130 patients, there was female predominance (59.3%, n=77) as compared to male (40.7%, n=53) and age group distribution shows maximum cases (49.2%, n=64) in the age group 61-80 years followed by 41-60 years (33.8%, n=44), and more than 80 years (14.6%, n=19) while least cases were in the group 18-40 years (2.3%, n=3). Average age was 65.77 years (SD±13.52).

Table:1-Background information of Diabetic patients-

Background of patients	Number (%) of patients
Sex	
Male	53(40.7)
Female	77(59.3)
Age (in years)	
18-40	3(2.3)
41-60	44(33.8)
61-80	64(49.2)
Above 80	19(14.6)
Educational status	
Illiterate	30(23)
Primary level	29(24.3)
High school level	36(27.6)
Above high school level	35(26.9)
Per capita income-in INR (Prasad's classification)	
I-(above 7417)	
II- (3709-7417)	15(11.5)
III- (2226-3708)	32(24.6)
IV- (1113-2225)	38(29.2)
V- (below 1113)	24(18.4)
	21(16.1)
Comorbidities	

Hypertension	67(51.5)
Nephropathy	25(19.2)
Hypothyroidism	20(15.3)
IHD	18(13.8)
COPD	11(8.4)
Others	14(10.7)
Type of antidiabetic therapy	
OHA	86(66.1)
OHA + Insulin	22(16.9)
Insulin	12(9.2)
Diet control	10(7.6)
Previous episode of hypoglycaemia	
Yes	28(21.5)
No	102(78.5)

We found more of literate patients(77%, n=100)than illiterate (23%, n=30) and maximum patients belonged to class III (29.2%, n=38) followed by class II (24.6%, n=32) while least were in class I (11.5%, n=15). Many of them had the co-morbidities such as hypertension (51.5%, n=67), nephropathy (19.2%, n=25),hypothyroidism (15.3%, n=20), ischemic heart disease (13.8%, n=18) and COPD (8.4%, n=11). There were more than one co-morbidities in many patients. Most of the patients (66.1%, n=86) were on oral hypoglycaemic agents(OHA) while some (16.9%, n=22) were on combined OHA and insulin whereas rest were on only insulin (9.2%, n=12) and diet control(7.6%, n=10) in that order (**Table-1**). As per the answers that were provided by patients on their perception of symptoms of hypoglycaemia, dizziness (70%, n=91), weakness (69.2%, n=90) and drowsiness (54.6%, n=71) were commonwhile fits (3%, n=4) were least thought neuroglycopenic symptoms. On the other hand, hunger (67.6%, n=88) and sweating (27.6%, n=36) were the common neurogenic symptoms known to them(**Table-2**).Knowing the risk factors will make the patient more cautious and proactive in avoiding the episodes of hypoglycaemia.Inadequate/delayed food consumption and medications were the common (50%, n=65and 30.7%, n=40respectively) while physical exertion and alcoholism were lesser known (11.5%, n=15 and 10.7%, n=14 respectively)precipitating factors of hypoglycaemia. As it is well known that if someone feels the symptoms of hypoglycaemia and knows how to manage it, he can avoid major complications. In this context most of the patients opted to consult nearby doctor (77.6%, n=101) , take food/sugar (66.1% , n=86), rush to emergency services(45.3%,n=59)while lesser patients thought of frequent sugar monitoring (41.5%, n=54) and stopping the antidiabetic medications(33%,n=43)(**Table-3**).Those who had good knowledge, gave the credit of their awareness todoctors (53%, n=69), familymembers (30.7%, n=40), and colleague(21.5%, n=28)(**Table-4**). Thoughthere were 78.5%(n=102) patients with good knowledge but40.2%(n=41) were not keeping it into practice(**Table-5**). They accepted this noncompliance and attributed it to several personal and professional issues like difficulty in carrying their insulin, busy work schedule, poor life style modifications etc. When we observed the association between good knowledge about hypoglycaemia, the variables that had significant correlation (p-value<0.05) with good knowledgewere patients with age below 80years, higher per capita income, literacy, and presence of comorbidity. There was no significant association between gender, type of antidiabetic treatment, previous history of hypoglycaemia and knowledge on hypoglycaemia.

Table:2–Awareness on symptoms of hypoglycaemia-

NEUROGENIC	Number (%)	NEUROGLYCOPENIC	Number (%)
Hunger	88(67.6)	Dizziness	91(70)
Sweating	36(27.6)	Weakness	90(69.2)
Trembling	27(20.7)	Confusion	16(12.3)
Palpitation	5(3.8)	Drowsiness	71(54.6)
Anxiety	20(15.3)	Loss of consciousness	26(20)
Tingling	14(10.7)	Visual blurring	16((12.3)
		Headache	28(21.5)
		Difficulty in speaking	10(7.6)
		Fits	4(3)

Table:3-Awareness on precipitating factors and remedial actions on hypoglycaemic events-

Number (%)	
Precipitating factors	
Inadequate/delayed food	65(50)
Medication induced	40(30.7)
Physical exertion	15(11.5)
Alcoholism	14(10.7)
Actions during hypoglycaemia	
Consult nearby Doctor	101(77.6)
Food/sugar ingestion	86(66.1)

Rush to emergency services	59(45.3)
Frequent blood sugar monitoring	54(41.5)
Stop antidiabetic medicines	43(33)
Avoid exercises	40(30.7)
Don't know what to do	29(22.4)

Table:4-Source of knowledge-

Source	Number (%)
Doctor	69(53)
Nursing Staff	17(13)
Diabetic educator	5(3.8)
Electronic media	19(14.6)
Colleague	28(21.5)
Family members	40(30.7)
Hospital Pamphlets	3(2.3)
News paper	9(11.7)

Table:5-Hypoglycaemia incidence in patients with poor and good knowledge-

Patients with poor knowledge(N=28)		Patients with good knowledge(N=102)			
Hypoglycaemia		Compliant (N=61)		Noncompliant(N=41)	
		Hypoglycaemia			
No	Yes	No	Yes	No	Yes
20(71.4%)	8(28.6%)	57(55.9%)	4(3.9%)	25(24.6%)	16(15.6%)

Table:6- Association between good awareness on hypoglycaemia and various variables of Diabetic patients-

Variables	Number (%)	p-value
Age (in years)		
<60	42(89.3)	.004494
61-80	50(78.1)	
>81	10(52.6)	
Sex		
Male	42(79.2)	.856882
Female	60(78)	
Per capita income-		
I->7417	14(93.3)	.001151
II-3709-7417	29(90.6)	
III-2226-3708	32(84.2)	
IV-1113-2225	17(71)	
V-<1113	10(47.6)	
Education-		
Illiterate	15(50)	.000015
Literate	87(87)	
Comorbidities		
With at least one	88(86.2)	.000035
Without	14(50)	
Anti-diabetics		
Diet control	7(70)	.148756
Insulin	7(58.3)	
OHA	68(79)	
Insulin+OHA	20(91)	
Previous hypoglycaemic episodes		
Yes	20(19.6)	.073165
No	82(80.3)	

IV. Discussion

Glycaemic control is not without risk of hypoglycaemic episodes and hence it becomes imperative to have a good knowledge of hypoglycaemia and its preventive and corrective measures. With this idea, we conducted this study on 130 patients and found 59.3% female and 40.7% male. Similar female predominance (76.5%) was also noted by Shriram et al^[8] while the reverse was seen (33.7% females) in an Ethiopian study.^[9] It was not associated with significant level of difference in knowledge on hypoglycaemia. There were 89.3% patients

of age less than 60 years who had good awareness on hypoglycaemia. Similar result with good knowledge was also seen in other studies.^[8,9] Elderly patients are less aware of hypoglycaemic episodes due to mental and physical issues including neuropathic hypoglycaemic unawareness, ie dysautonomia.^[10,11]

We noted that literacy and better financial status were associated with good awareness (p -value<0.05) and a similar result was also found by Shriram et al^[8] and P. Thenmozhi et al^[12]. The common associated comorbidities were systemic hypertension (51.5%) and nephropathy (19.2%). Out of those who had at least one comorbidity, 86.2% had good knowledge on hypoglycaemia. This is probably because of more frequent visits to health care persons and more discussion on their diabetic status and comorbidities. We did not find a significant correlation between type of antidiabetic modalities, previous history of hypoglycaemic episodes and good knowledge on hypoglycaemia. Common symptoms of hypoglycaemia known to the patients were dizziness (70%), weakness (69.2%), hunger (67.6%), drowsiness (54.6%), and sweating (27.6%) while Shriram et al^[10] found these to be 81.4%, 73.8%, 59.6%, 72.1% and 57.1% respectively. Other symptoms like tingling, confusion, palpitation, fits, visual blurring were not known to many, so if some of these patients feel such symptoms, they may not attribute these to hypoglycaemic episodes and so no corrective actions will be taken. As per the options chosen by the patients, factors that could lead to precipitation of hypoglycaemia were inadequate/delayed food intake (50%), medications for diabetic control (30.7%), and exertion (11.5%) while Shriram et al^[10] found it to be food related, exertional, and drug related in that order. Actions to be taken on suspected or confirmed hypoglycaemia were, consulting a nearby doctor (77.6%), adequate and timely food intake (66.1%), visiting medical emergency (45.3%), frequent blood sugar monitoring (41.5%), avoiding exertions (30.7%), stopping or reducing medications (33%) while 22.45% admitted that they did not know what to do. Knowing about all the symptoms of hypoglycaemia will help diagnose it early and so immediate on the spot remedial actions can be taken so that no life-threatening situations arise. In a study by Jennings AM et al^[13], 5.9% diabetics on OHA's in the age group of 40 to 65 years felt hypoglycaemic symptoms but because of good awareness on hypoglycaemia and its corrective measures they did not need hospitalization. On enquiring about their source of awareness, maximum patients gave the credit to doctors (53%), family members (30.7%) and colleague (21.5%) while nurses, diabetic educator, and media were the rest among educating group. Therefore, it becomes mandatory to inform and educate everyone, whoever comes with patient. Though there were 78.5% patients with good knowledge but 40.2% of them were not practicing it due to many factors like taking lesser food or delaying it due to busy work schedule, missing medicines and frequent travels that puts them at potential risk of hypoglycaemic episodes. In a study by Spoorthi et al, 54% patient had average knowledge on hypoglycaemia and 59% of total patients have experienced its symptoms.^[14] The better knowledge on hypoglycaemia shows tendency to have good practice on its preventive actions like another Ethiopian study showed that two third of patients who had good practice on prevention of hypoglycaemia were having good knowledge.^[15] It has been proved in a multi-national cross-sectional study that educating patients about their disease, enables them to apply preventive and proactive strategies to decrease the re-occurrence of unwanted hypoglycaemic events.^[16]

It shows that counselling each patient and their friends/relatives on all the aspects of hypoglycaemia including its remedy at home and its preventive action is of high value in management of diabetes mellitus. Also maintaining good compliance by all makes it cost effective and prevents from unnecessary hospital admissions.

V. Conclusions

We found that sound knowledge was seen in a significant number (78.5%) of patients but many of them were not percolating it down in their day to day practice and that has kept them at a high risk of hypoglycaemia. So, it is quite necessary to educate them at regular intervals and remind about being strictly compliant.

Limitations of study: This study was in a small number of patients over a short period of time. A larger population study may give a fair idea of the knowledge and attitude of patients towards hypoglycaemia.

Conflict of interest: None

Financial support: Nil

Ethical clearance: Obtained

Acknowledgement: We would like to thank Dr. Saurabh Pathak, Registrar in the Department of Nephrology, Tata Main Hospital, Jamshedpur for his technical support.

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Mohammad Zeya Ansari, et. al. "A Tertiary Care Hospital Based Study on Knowledge and Attitude of Diabetic Patients Towards Hypoglycaemia." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 19(9), 2020, pp. 39-44.