

An institution-based assessment of the knowledge on hypoglycemia among the diabetic patients: An observational study

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Abstract

Aim: The aim of the present study was to assess the level of knowledge of diabetic patient regarding hypoglycaemia and to find out the association between the levels of knowledge of diabetic patient on hypoglycaemia with their selected demographic variable.

Methods: An institution-based, descriptive, cross-sectional study was conducted among 100 sampled diabetic patients admitted to medicine ward and visiting endocrinology OPD who were selected through purposive sampling technique.

Results: Out of 100 samples, a majority (55%) of them was in the age group above 40% years, and 51% of them were female. Regarding educational status, 47% had obtained primary level of education, remaining 8% of them had completed above secondary level of education, and most of them 34% were unemployed, majority 45% of them had an earning income between (Rs. 5000-9000). Maximum 92% of them follows Hinduism, 75% of them had have diabetes mellitus with duration between 1-10 years, with the insulin therapy contributes 10% with twice a day and remaining 2% of them were on once a day. Regarding symptoms, nearly 70% of the sample had experienced hypoglycemic. More than half of the sample 60% had a dietary pattern of 3 times a day. More than half of the samples 52% of them had fair knowledge on hypoglycemia and 25% of them were having good knowledge and the remaining 23% of them had poor knowledge regarding hypoglycemia respectively with the overall mean and SD 35.5±14.34.

Conclusion: The study's findings highlighted the fact that most diabetes mellitus patients had a fair understanding of hypoglycemia. The health care personnel should also take time and efforts to educate patients about the sign of hypoglycemia. So that hypoglycemic episodes and morbidity could be reduced or prevented at primordial level.

Keywords: Diabetes mellitus, hypoglycemia, knowledge, insulin, oral hypoglycemic drugs

Introduction

Hypoglycemia is the rate limiting complication in the achievement of strict glycaemic control in diabetes management. Significant episodes of hypoglycemia and its attendant counter-regulatory hormonal response lead to poor glycaemic control. The former may also be associated with cardiovascular and cerebrovascular morbidities [1]. Large trials (action to control cardiovascular risk in diabetes, Veterans affairs diabetes trial) have shown that there were a higher mortality in the group that had hypoglycemia (intensively treated arm) [2, 3]. Hence, the American Diabetes Association (ADA) guidelines emphasize on individualizing targets and reducing risk of hypoglycemia in patients with long duration of diabetes and comorbidities [4].

In a survey conducted by the American Association of Clinical Endocrinology among 2530 type 2 diabetic patients in America, it was revealed that though more than half of the study population experienced hypoglycemic episodes in the past, many patients were unaware of the precipitating factors or causes of such episodes. There was definitely a knowledge gap which needed to be addressed [5]. In a study done in Erode district in the state of Tamil Nadu in India, that blood sugar levels can drop below normal while on drugs was known to around 40% of the diabetic subjects only [6]. The symptoms of hypoglycemia are varied. The symptoms may be nonspecific with intensity decreasing with increasing age. Thus, it is very important that the subjects are able to recognize and identify the symptom onset at an early stage in order to manage the episode effectively and take steps to prevent the recurrence.

Further recurrent episodes of hypoglycemia result in hypoglycemia unawareness [7]. Hypoglycemic episodes,

especially if severe or recurrent may result in significant psychosocial dysfunction and lower quality of life. In spite of the knowledge about the importance of hypoglycemia, it is still a relatively neglected complication in diabetes care in the setting [1]. In a survey conducted among 2530 Americans with type 2 diabetes, 55% reported having experienced hypoglycemia in the past [8]. The India Hypoglycemia Study Group highlights that there is negligible data on the epidemiology of hypoglycemia in type 2 diabetes from India, which has the second largest number of diabetes patients in the world [9]. The ADA workgroup on hypoglycemia has reported a condition, "Probable Symptomatic Hypoglycemia" where there are typical symptoms of hypoglycemia without a measured plasma glucose concentration. According to them, even though these conditions may not be suitable outcome measures for clinical studies evaluating therapy, it would be useful to report such episodes [10].

The aim of the present study was to assess the level of knowledge of diabetic patient regarding hypoglycaemia and to find out the association between the levels of knowledge of diabetic patient on hypoglycaemia with their selected demographic variable.

Materials and methods

An institution-based, descriptive, cross-sectional study was conducted among 100 sampled diabetic patients admitted to medicine ward and visiting endocrinology OPD who were selected through purposive sampling technique.

Inclusion criteria

Patients with following criteria were included- (a) who has been diagnosed as diabetes mellitus from not more than 1 year; and (b) those who were willing to participate.

Exclusion criteria

Patients with following criteria were excluded- (a) those who are not available during data collection; and (b) who were seriously ill and unable to communicate, patients who were

Ethical considerations

Ethical clearance for the study was obtained from the Institutional ethics committee. Participation of the subjects in the study was voluntary and informed consents were obtained from all participants. Confidentiality and anonymity of information were maintained.

Data were collected semi-structured questionnaire on knowledge on hypoglycemia. Descriptive data were subjected to analyse by using percentages and frequency distribution with mean and standard deviation and inferential data was interpreted by Chi- square test in SPSS version 21 at a 0.05% level of significance, to determine the association between selected demographic variables and research variable.

Results

Table 1: Frequency and percentage distribution of diabetes mellitus patient with hypoglycemia according to demographic variables

Demographic characteristics	Frequency (N)	Percentage (%)
Age in year		
25 to 40	45	45
Above 40	55	55
Gender		
Male	49	49
Female	51	51
Other		
Educational status		
Illiterate	21	21
Primary level	47	47
Secondary level	24	24
Above higher secondary level	8	8
Occupation		
Unemployed	34	34
Labour	30	30
Farmer	10	10
Government service	8	8
Self-employed	18	18
Income in Rupees		
1000-4000/-	40	40
5000-9000/-	45	45
10000 and above	15	15
Religion		
Hindu	92	92
Muslim	6	6
Christian	0	0
Buddhist	2	2
Others	0	0
Duration of diabetes mellitus (years)		
1 to 10	75	75
11 to 20	20	20
Above 20	5	5
Treatment for diabetes mellitus		
Insulin therapy	32	32
Drug therapy	68	68
Frequency of taking medication		
Oral drug once in a day	48	48
Oral drug twice in a day	42	42
Oral drug thrice in a day	10	10
Insulin users		
Once in a day	2	2
Twice in a day	10	10
Experience any symptoms of hypoglycemia		
Yes	70	70
No	30	30
Dietary habit		
2 times in a day	35	35
3 times in a day	60	60
4 times in a day	5	5

Out of 100 samples, a majority (55%) of them was in the age group above 40% years, and 51% of them were female. Regarding educational status, 47% had obtained primary level of education, remaining 8% of them had completed above secondary level of education, and most of them 34% were unemployed, majority 45% of them had an earning income between (Rs. 5000-9000). Maximum 92% of them follows Hinduism, 75% of them had have diabetes mellitus with duration between 1-10 years, with the insulin therapy contributes 10% with twice a day and remaining 2% of them were on once a day. Regarding symptoms, nearly 70% of the sample had experienced hypoglycemic. More than half of the sample 60% had a dietary pattern of 3 times a day.

Table 2: Frequency percentage distribution of patient according to their level of knowledge on hypoglycemia among the diabetic patient

Level of knowledge on hypoglycemia	Frequency (N)	Percentage (%)	Mean±SD
Good	25	25	35.5±14.34
Fair	52	52	
Poor	23	23	

More than half of the samples 52% of them had fair knowledge on hypoglycemia and 25% of them were having good knowledge and the remaining 23% of them had poor knowledge regarding hypoglycemia respectively with the overall mean and SD 35.5±14.34.

Table 3: Chi-square association between the knowledge of diabetic patient on hypoglycemia with the demographic characteristics

Demographic characteristics	Level of knowledge on hypoglycemia			Total	df	Chi square (□2)	Prevalence
	Good	Fair	Poor				
Age in year							
25-40	15	20	14	49	1	6.6735	0.030
Above 40	10	32	9	51			
Gender							
Male	14	24	16	54	1	0.983	0.798
Female	11	28	7	46			
Educational status							
Illiterate	4	9	6	19	3	7.948	0.837
Primary level	14	24	9	47			
Secondary level	6	14	5	25			
Above higher secondary level	1	5	3	9			
Occupation							
Unemployed	10	18	5	33	4	6.34	0.576
Labour	5	17	7	29			
Farmer	2	6	3	11			
Government service	2	5	3	10			
Self-employed	11	6	5	22			
Income in Rupees							
1000-4000/-	7	24	12	43	2	12.1867	0.140
5000-9000/-	14	20	10	44			
10000 and above	4	8	1	13			
Religion							
Hindu	20	48	18	86	2	2.180	0.75
Muslim	3	3	3	9			
Others	2	1	2	5			
Duration of diabetes mellitus (years)							
1 to 10	20	45	10	75	2	4.334	0.36
11 to 20	4	6	10	20			
Above 20	1	1	3	5			
Treatment for diabetes mellitus							
Insulin therapy	10	2	16	28	1	32.18	0.0001
Drug therapy	15	50	7	72			
Frequency of taking medication							
Oral drug once in a day	5	30	10	45	3	15.35	0.25
Oral drug twice in a day	18	15	6	39			
Oral drug thrice in a day	1	4	2	7			
Insulin users	1	8	5	14			

It was evident that, there was a significant association between the level of knowledge of diabetic clients on hypoglycemia with their selected demographic variable in terms of age, income, treatment, frequency of taking medicine, experience of symptoms of hypoglycemia and dietary habit.

Discussion

Diabetes is well recognized as a global health burden of the 21st century. The number of patients with DM has continued to rise over the last few decades. In India, more

than 62 million people have diabetes. The management of diabetes is frequently made more difficult, despite the availability of numerous effective anti-diabetic medications and regimens. One of the most important effects of diabetes mellitus is hypoglycemia, which happens when the blood sugar level drops below the ideal range [11-13]. Hypoglycemia is the rate limiting complication in the achievement of strict glycemic control in diabetes management. Significant episodes of hypoglycemia and its attendant counter-regulatory hormonal response lead to poor glycemic control. The former may also be associated with

cardiovascular and cerebrovascular morbidities^[14]. Large trials (action to control cardiovascular risk in diabetes, Veterans affairs diabetes trial) have shown that there were was a higher mortality in the group that had hypoglycemia (intensively treated arm)^[15, 16]. Hence, the American Diabetes Association (ADA) guidelines emphasize on individualizing targets and reducing risk of hypoglycemia in patients with long duration of diabetes and comorbidities^[17]. Out of 100 samples, a majority (55%) of them was in the age group above 40% years, and 51% of them were female. Regarding educational status, 47% had obtained primary level of education, remaining 8% of them had completed above secondary level of education, and most of them 34% were unemployed, majority 45% of them had an earning income between (Rs. 5000-9000). Maximum 92% of them follows Hinduism, 75% of them had have diabetes mellitus with duration between 1-10 years, with the insulin therapy contributes 10% with twice a day and remaining 2% of them were on once a day. Regarding symptoms, nearly 70% of the sample had experienced hypoglycemic. More than half of the sample 60% had a dietary pattern of 3 times a day. More than half of the samples 52% of them had fair knowledge on hypoglycemia and 25% of them were having good knowledge and the remaining 23% of them had poor knowledge regarding hypoglycemia respectively with the overall mean and SD 35.5±14.34. This finding was higher than the study conducted in South Gondar, Ethiopia shows that 25.5% of the participants had good knowledge on hypoglycaemia^[18]. Similarly, in a study carried out among patients with diabetes mellitus by Sharma *et al* who stated that overall (64.4%) diabetic patients had good knowledge of hypoglycaemia^[19]. Another study conducted in Nepal revealed that among them 27% of participants has inadequate knowledge, remaining 23% has adequate knowledge^[20]. A lower level of awareness was reported in the study conducted by Thenmozhi *et al* who found that (20%) of the participants had moderately adequate knowledge, and 16.67% of them had adequate knowledge^[21].

It was evident that, there was a significant association between the level of knowledge of diabetic clients on hypoglycemia with their selected demographic variable in terms of age, income, treatment, frequency of taking medicine, experience of symptoms of hypoglycemia and dietary habit. Study conducted in Tamil Nadu revealed that there is a significant association with type of treatment at the level of $p < 0.05$ with the level of knowledge. The findings are consistent with the study conducted by Shriram *et al* and found that 66.1% of diabetic patients had good knowledge on hypoglycemia, however, use of medicine of the client is associated with the level of knowledge ($p < 0.05$)^[22]. Study conducted by Suzy *et al* hope showed the findings that the knowledge on the symptoms of hypoglycemia were significantly associated with the advancement of age^[23]. A study was conducted in Saudi Arabia depicted the significant association seen among monthly income, patient having previous hypoglycemia experience ($p < 0.05$)^[24].

Conclusion

Hypoglycemia is quite prevalent amongst people with type 2 diabetes on treatment particularly those on insulin. The study findings concluded that the participants had fair level of knowledge on hypoglycemia among patients with diabetes mellitus. Health-care professionals have a major

role in educating clients with diabetes mellitus about hypoglycemia risk factors, recognition of symptoms of hypoglycemia, first aid measures of hypoglycemia, blood glucose monitoring, and selection of appropriate regimens, thereby minimize the risk of hypoglycemia, and prevent the potential complications of hypoglycemia at primordial level.

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