

Effect of diabetic education on the knowledge, attitude and practices of diabetic patients towards prevention of hypoglycemia

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ABSTRACT

Aims: To assess the role of diabetic education in increasing awareness about hypoglycemia and decreasing hypoglycemic symptoms in diabetics. **Materials and Methods:** This is a longitudinal study involving the use of a structured questionnaire for obtaining baseline information related to knowledge, attitude and practices (KAP) of diabetic patients regarding hypoglycemia. Then the patients were given diabetic education by the treating doctor regarding hypoglycemia, its symptoms and prevention; the effect of which was assessed by repeating the same questionnaire after a month. The occurrence of hypoglycemic symptoms was also compared before and after diabetic education. **Results:** There is a significant improvement in all parameters like KAP with diabetic education. The hypoglycemic episodes also decrease significantly. **Conclusions:** Proper diabetic education is seen to improve the knowledge and attitude of the diabetic patients toward hypoglycemia. This leads to improved practices of such patients and decrease hypoglycemic episodes in them.

Key words: Diabetes, hypoglycemia, Stanford questionnaire

INTRODUCTION

Hypoglycemia is one of the most common complications of diabetes management. The over enthusiastic approach in maintaining tight blood sugar control so as to reduce the long-term complications of diabetes have resulted in increase in frequency of this complication. This situation seems to get worsened with use of combination of anti-diabetic drugs.

The American Diabetes Association defines the hypoglycemia as “any abnormally low plasma glucose concentration that exposes the subject to potential

harm”, and proposes a threshold of <70 mg%.^[1] The spectrum of symptoms depends on duration and severity of hypoglycemia and varies from autonomic activation to behavioral changes to altered cognitive function to seizures or coma. The short and long-term complications include neurologic damage, trauma, cardiovascular events and death.^[2] There can be a six fold higher incidence of death, increased costs of medical care, and loss of productivity due to hypoglycemia.^[3] Apart from patient-related factors like lifestyle and comorbid conditions of the patients, various other factors like choice, dose, timing and combination of anti-diabetic drugs together with simultaneous use of other interacting drugs can increase the risk of hypoglycemia in diabetics.

Some studies have been conducted to evaluate the knowledge and awareness about hypoglycemia in diabetics. But in this study we have tried to evaluate how successful can diabetic education prove to be in improving the awareness of hypoglycemia and the practices adopted by the diabetics for its prevention. This would be helpful in

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Quick Response Code:



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DOI:
10.4103/2230-8210.152781

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formulating certain strategies that can keep a check on this common complication of diabetes treatment.

MATERIALS AND METHODS

The study is a longitudinal study conducted between May 2014 and November 2014. The diabetic patients attending out-door facility of the hospital and who were being treated with oral hypoglycemic drugs were included in the study after obtaining their written informed consent. Diabetic patients on insulin therapy were not included in the study. Some important demographic characteristics of the patients like age, gender, education level were studied. The patients were then given a predesigned and pretested performa to fill the questionnaire. The questionnaire was given in Hindi for easy comprehension of the patients and their attendants. They were then prior asked for ability to read and comprehend the questionnaire. In the case of illiterate patients and attendants, the questionnaire was filled up with the help of treating doctor. The questionnaire had 20 questions to assess the knowledge (7), attitude (7) and practices (6) (KAP) of the diabetic patients toward prevention of hypoglycemia. The knowledge part of the questionnaire was to assess the knowledge of the possibility of hypoglycemic episodes in the diabetic patients and its common symptoms. The questions asked from the patients to judge his knowledge aspect are given in Table 1. Attitude part of the questionnaire was to evaluate the beliefs of the patient regarding simple preventive measures for avoiding hypoglycemia. The practice part of the questionnaire was to judge how the knowledge and attitudes of the patients are practically put into action. Each correct response was given a score of “one” and each wrong answer or unsure response was given a score of “zero”. Seven questions from Stanford questionnaire^[4] were also included in the performa to check the incidence of hypoglycemic symptoms in the patients in the past 1-week. The symptoms enquired were morning headaches, nightmares, night sweats, light headedness, shakiness or weakness, intense hunger and passing out episodes. The maximum possible score for each of the observed parameter was seven except for “practices” parameter where the maximum score was 6. After filling the performa, the diabetic patients and their attendants were educated by the treating doctor regarding possibility of hypoglycemia as a complication of diabetes treatment, its consequences, common hypoglycemic symptoms and some simple precautions to be taken to avoid its occurrence. Patients were also advised to adopt the practice of self-monitoring of blood glucose. Dose and timing of drug administration was not changed. The

patients were followed up after a month and again given the same KAP questionnaire to check for improvement in their KAP toward hypoglycemia. The incidence of hypoglycemic episodes in the last 1-week was again checked with the help of Stanford questionnaire. The mean scores for each parameter were calculated. The baseline scores and the follow-up scores were compared by paired *t*-test to assess the effect of diabetes care education on prevention of hypoglycemic episodes and improvements in KAP of diabetic patients toward hypoglycemia.

RESULTS

Out of 137 patients who were given questionnaire, only 109 patients were included for the final analysis. Rest of the patients were lost to follow-up. Out of these 109 patients, 63 (57.79%) were males and rest 46 (42.20%) were females. The mean age of the patients at the time of inclusion in the study is 53.8 ± 1.1 years. The demographic characteristics of the patients are included in Table 2.

The mean baseline scores and postdiabetic education scores for each parameter like KAP and hypoglycemic symptoms are summarized in Table 3. It is evident that there is a significant ($P < 0.001$) improvement in the KAP of diabetics after diabetic education. This translates into a significant reduction in the hypoglycemic symptoms occurring in these patients.

Table 1: Questions to assess knowledge of hypoglycemia

Serial number	Questions
K1	Can hypoglycemia occur in diabetics?
K2	Can hypoglycemic episodes prove to be dangerous?
K3	Can hypoglycemia be precipitated by skipping of meals or excessive exercises?
K4	Is morning headache one of the symptoms of hypoglycemia?
K5	Is shakiness or weakness one of the symptoms of hypoglycemia?
K6	Is intense hunger one of the symptoms of hypoglycemia?
K7	Is passing out one of the symptoms of hypoglycemia?

Table 2: Demographic characteristics of the patients

Characteristics	Number of patients	Percentage of patients
Gender		
Males	63	57.79
Females	46	42.20
Education level		
Illiterate	32	29.35
Primary	37	33.94
Secondary	28	25.68
Graduate and post graduate	12	11.00

The percentage of patients responding correctly to each individual question of each parameter is indicated in [Figures 1-3]. Figure 4 indicates the comparison of hypoglycemic.

DISCUSSION

There is a big lacuna in the existing knowledge and attitude regarding hypoglycemia in diabetics. The possibility of hypoglycemia and its common symptoms are known to

only a few. Although many patients give importance to timely intake of meals and medicines, but the attitude toward other parameters like self-monitoring of blood glucose, keeping toffees or candies for an emergency situation and avoiding excessive exercises is largely lacking. With regard to practices, the situation is even worse. Many patients who had good knowledge and beliefs about hypoglycemia did not still put it into practice. Apart from a lack of awareness, forgetfulness and busy job schedule of the patients were the most common reasons, which did not allow a large number of patients to be self-disciplined regarding timely intake of meals and medicines. Among the patients who knew about the importance of self-monitoring of blood glucose levels, many were not able to implement it due to lack of resources and education. Many patients suffered from hypoglycemic symptoms in the past 1-week, as judged by the Stanford questionnaire. Out of all the symptoms, weakness, shakiness, and intense hunger were most frequently complained of.

Table 3: Mean baseline scores and scores after diabetic education

	Maximum scores	Mean baseline score±SEM	Mean score after diabetic education±SEM	P
Knowledge	7	1.24±0.20	5.14±0.18	<0.001
Attitude	7	2.11±0.11	5.01±0.09	<0.001
Self-reported practices score	6	1.57±0.09	2.96±0.10	<0.001
Hypoglycemic symptoms score	7	1.11±0.09	1.01±0.08	0.004

SEM: Standard error of mean

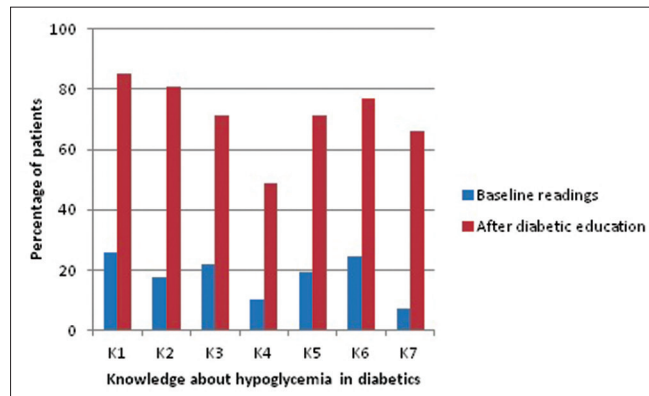


Figure 1: Frequency distribution of diabetics according to their knowledge of hypoglycemia

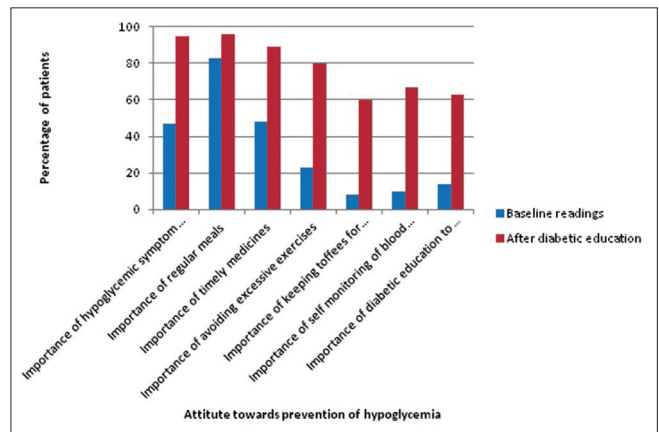


Figure 2: Frequency distribution of diabetics according to their attitude toward hypoglycemia prevention

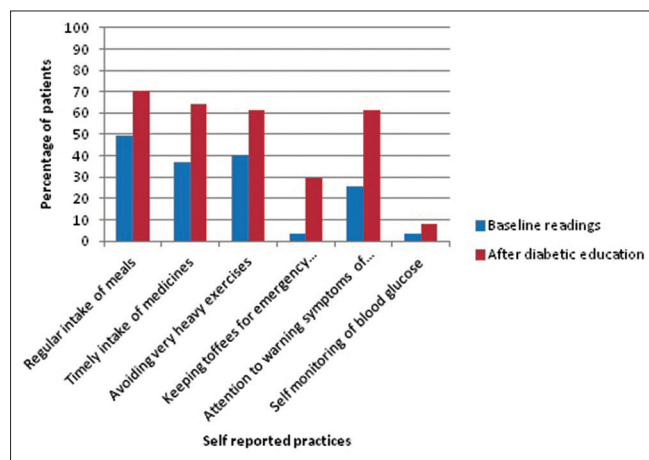


Figure 3: Frequency distribution of diabetics according to their self-reported practices

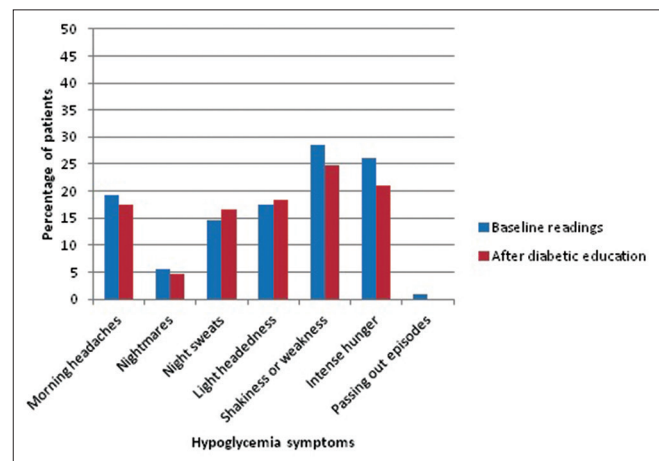


Figure 4: Frequency distribution of diabetics according to their hypoglycemic symptoms

With diabetic education, there is a significant improvement both in knowledge and attitude of the patients. A significant number of patients now know about the possibility of hypoglycemia in diabetics and the dangerous nature of hypoglycemic episodes. The knowledge about the symptoms of hypoglycemia has also increased. A lot of patients have started believing in the importance of knowing about the hypoglycemic symptoms so as to prevent them. Attitude toward timely intake of meals and medicines also showed good improvement. Although there is an improvement in the practices of the patient also but it was not equivalent to the improvement in knowledge and attitude of the patients. Best-followed practices were regular and timely intake of meals and medicines. A large number of patients also started paying attention to warning episodes of hypoglycemia. But, unfortunately, the practice of self-monitoring of blood glucose and keeping toffees and candies as an emergency measure was least commonly followed. Although there has been a significant decrease in the overall hypoglycemic symptom score (Stanford score) after diabetic education, but the complaint of night sweats and light headedness did not decrease even after diabetic education. The decrease in overall hypoglycemic symptom score is due to less hypoglycemic episodes seen in the patients and is indicative of the good influence of diabetic education on the patients.

Thus, proper diabetic education provides us with a ray of hope of improving the knowledge and attitude of the patients and decreasing the hypoglycemic episodes in diabetics. But one of the major challenges in the way of diabetic education is busy time schedule of the doctors that does not allow adequate time for their interaction with the patients. Low literacy level of the patients and their attendants leading onto incomplete interpretation of the instructions is another major problem. Many of the patients tend to forget the advices given by the health care providers, but this problem may largely be overcome by repeated health education and motivation.

LIMITATIONS OF THE STUDY

The hypoglycemic symptoms as judged by Stanford questionnaire were not backed up with biochemical confirmation. The questionnaire enquired about the hypoglycemic symptoms in the past 1-week only. "Recall bias" was another limitation of the study as the answers to the questionnaire were largely subjected to patient's memory. Only one session of diabetic education was given to the patients before their next evaluation.

CONCLUSIONS

Proper diabetic education of diabetic patients can prove to be very valuable tool for prevention of hypoglycemia. But the important hurdles in its way are busy and hectic schedule of health care providers, low literacy level and forgetfulness of the patients and their attendants, busy jobs of some of the patients and their low socio-economic levels. In spite of these obstacles, repeated and regular education, motivation and encouragement of the patients can not only improve the knowledge of the patients but also reduce the gap between knowledge and practices.

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Cite this article as: Bhutani G, Kalra S, Lamba S, Verma PK, Saini R, Grewal M. Effect of diabetic education on the knowledge, attitude and practices of diabetic patients towards prevention of hypoglycemia. *Indian J Endocr Metab* 2015;19:383-6.

Source of Support: Nil, **Conflict of Interest:** None declared.