Knowledge of hypoglycemia by primary health care centers registered diabetic patients

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ABSTRACT

Objective: to assess the knowledge of diabetic patients about symptoms of Hypoglycemia, and the variables that may be associated with that knowledge.

Methods: A cross-sectional study of 1039 diabetic subjects, registered in the urban and rural primary health care centers of Makkah. The tool of data collection was a structured questionnaire. The parameters of the study were lack of knowledge about hypoglycemia measured as knowledge of individual symptoms; and the proportions of patients with poor knowledge score.

Results: The frequency of lack of knowledge of symptoms of hypoglycemia was around 50% of subjects.

Two-third of subjects had a poor knowledge score. Main variables significantly associated with poor knowledge score were male gender (P< 0.001), low education (P < 0.0001), non-compliance with treatment (P < 0.02), and lack of knowledge about hypoglycemia (P < 0.00001).

Conclusions: There is a need for health education of diabetic subjects about symptoms of hypoglycaemia, in order to deal with it in an effective way.

Keywords: Knowledge, hypoglycemia.

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Hypoglycemia is an acute syndrome that occurs when the blood glucose level falls to bellow 0.55 g/l (3.0 mmol/l), and which may endanger patients' lives as well as other person's lives. It is a common emergency in hospital practice.^{1,2} The introduction of new drugs and intensified methods of diabetes mellitus treatment have considerably contributed to the occurrence of this problem.^{3,4} Some patients with long standing diabetes mellitus may lose the awareness of Hypoglycemia,⁵ but there is still a considerable proportion of patients who, by lack of health education, may not recognize its symptoms^{6,7} and hence their proper management may be delayed. For this reason patients' knowledge and perception of hypoglycemic symptoms needs to be assessed.⁸ The aim of this study is to assess the knowledge of

diabetic patients about symptoms of hypoglycemia, and the variables that may be associated with that knowledge.

Methods. This study was conducted at the primary health care (PHC) centers in the urban and rural region of Makkah, which comprises a total 67 centers (25 urban and 42 rural). The study population were adult diabetic subjects (15 years of age or more) who had a confirmed diagnosis of diabetes mellitus for the last one year, and who were registered in the diabetic registries of the PHC centers, in urban and rural Makkah areas, during the year 1420H. (1999G.). There was a total of 11,614 diabetic subjects of whom 8,110 (70%), and 3504

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(30%) were registered in the urban and rural PHC centers. A two-stage stratified random sampling technique, with proportional allocation to choose about (10%) of diabetic subjects, from 9 urban (including 870 diabetic subjects), and 12 rural PHC (including 290 diabetic subjects), was adopted. In the first stage, a simple random sampling technique was used to choose 9 urban and 12 rural PHC. In the second stage the sample of diabetic subjects from each chosen PHCC was chosen also, using simple random sample. A sample of 1160 subjects was aimed at (870 and 290 diabetic subjects from urban and rural centers, respectively). Data was collected by pre-trained PHC centers' physicians, using a structured questionnaire form. The questionnaire included socio-demographic data, in the form of age, sex, nationality, and educational level. Education level was categorized as low (primary and intermediate schooling), average (secondary schooling), and high (university and postgraduate). questionnaire also included information The regarding duration of diabetes mellitus, type of treatment taken (i.e. diet, oral hypoglycemic drugs, combinations), insulin or and self-reported compliance with treatment. Diabetes mellitus was classified into type 1 and 2 according to the patients' age, being less than 35 years or more than that; and whether he/she was being treated with insulin or oral hypoglycemic drugs. The latest fasting blood glucose result was recorded for each subject. Subjects were asked whether they knew what was meant by hypoglycemia. They were also asked about the symptoms of hypoglycemia, which they knew Correct and incorrect knowledge of each about. symptom was assigned "1" or "0". A scoring system was used whereby correct knowledge of less than three symptoms, and that of more than 3 symptoms, was considered as "poor" or "good". The main parameters of the study were firstly: lack of knowledge about hypoglycemia and its symptoms, measured as knowledge of individual symptoms; and secondly: as the proportions of patients with poor knowledge score. Data was analyzed using the Statistical Package for Social Science (SPSS PC) version 7.0. Chi-squared test was used to assess significance of differences between categories. A pvalue of 0.05 or less was considered to be indicative of statistical significance.

Results. The total number of patients who participated in the study was 1039 subjects, with a response rate of 90% (87.5% for urban, and 96% for rural areas). Males constituted 67% and females 33%. The overall mean age was 54.6 ± 12.6 years (55.6 ± 12.9 years for males and 52.7 ± 11.8 years for females). The majority of the sample (94%) were Saudi nationals. Regarding education level 75% of the sample were of low education, while those with

Symptom	Number with correct knowledge (%)
Dizziness Palpitations Sweating Nausea and vomiting Visual impairment Lack of concentration Loss of consciousness Abdominal discomfort	$532 (5) \\353 (34) \\503 (48) \\167 (11) \\480 (42) \\421 (40.5) \\336 (32) \\182 (17.5)$

 Table 2 - Knowledge score for hypoglycemia.

Score Value	Number (%)
Poor (0-3)	678 (65)
Good (4-6)	361 (35)
Total	1039 (100)

Table 3
 - Demographic variables associated with knowledge of hypoglycemia.

Variable	Total	Number with poor score (%)	P – value
Age (years)			
15 – 34 35 – 54 55+	51 449 539	29 (57) 280 (62) 369 (68.5)	
Gender			
Males Females	693 346	476 (69) 202 (58)	0.001
Nationality			
Saudis Non-Saudis	973 66	635 (65) 43 (65)	
Education Level			
Low Average High	780 197 62	52 (68) 125 (63.5) 26 (42)	0.0001

high education represented 6% only. Patients with type 2 diabetes mellitus constituted 95% of the sample and 62% of patients had diabetes for less than 10 years. On the other hand, 85% of patients were treated with oral hypoglycemic drugs and diet. When asked about compliance with treatment 85% of patients claimed that they were compliant. knowledge Regarding of the meaning of hypoglycemia, 58% of patients could correctly respond to that question. When asked about individual symptoms of hypoglycemia about half of patients could correctly mention dizziness, sweating and visual impairment. Fewer patients could mention other symptoms such as palpitations, lack of concentration, loss of consciousness, abdominal discomfort and nausea or vomiting (Table 1). In general, 65% of patients had a poor hypoglycemia knowledge score. (Table 2). As regards gender there were significantly more males with a poor hypoglycemia knowledge score than females (P< 0.001). On the other hand a poor score was shown by significantly more patients with low education level (P < 0.0001). Neither age, nor nationality had shown any significant variation with the score. (Table 3). As regards disease-related variables significantly more patients with non-compliance with treatment had poor hypoglycemic score compared to those who claimed that they were compliant (P< 0.02). On the other hand all patients who did not know the meaning of hypoglycemia had a poor hypoglycemia knowledge score (P<0.0001). Type and duration of diabetes, as well as type of treatment taken did not show any significant variation with hypoglycemia knowledge score. (Table 4).

Discussion. The majority of subjects in the sample involved in this study are beyond middle age, of low education level, and mostly suffering from type 2 diabetes mellitus. The sample included a majority of male gender, which could possibly be due to sampling error, or inadequacy of registration. The problem of lack of knowledge about hypoglycemia is a common one even among medical staff,⁹ and it reflects on the quality of care offered to diabetic patients. The study has revealed that only about half of subjects would recognize a few symptoms of hypoglycemia. Moreover, almost two-thirds of patients had a poor hypoglycemia knowledge score. These findings can be partially explained by the fact that the major proportion of the sample is composed by subjects with low education level. But equally important would be the problem of lack of health doctor-patient education and communication difficulties.¹⁰ The study has clearly shown that their knowledge regarding symptoms of hypoglycemia is

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Variables	Total	Number with poor score (%)	P-value
Type of Diabetes			
Type 1 Type 2	51 988	29 (57) 649 (66)	
Duration of Diabetes (years)			
1 - 4 5 - 9 10+	286 358 395	177 (62) 241 (67) 260 (66)	
Type of treatment			
Diet alone Oral Hypoglycaemic Drugs Insulin Insulin plus OHDs	17 867 121 34	11 (65) 579 (67) 71 (59) 17 (50)	
Reported drugs compliance			
Compliant Non-compliant	825 214	523 (63) 155 (72)	0.02
Knowledge of Hypoglycaemia			
Yes No	606 433	245 (40) 433 (100)	0.0000

inadequate. It seems that the problem of inadequate knowledge of symptoms of hypoglycemia is not uncommon in Saudi Arabia,¹¹ as well as elsewhere.^{4,7} The problem of lack of knowledge about hypoglycemia is often associated with deficient patients' knowledge about all aspects of diabetes mellitus.¹² Apart from directly leading to death, one of the indirect hazards of hypoglycemia is that it may endanger the life of a diabetic and other people, during motorcar driving,¹³ an activity that is practiced by the majority of the male population of Saudi Arabia. In these regards, the study finding that there were significantly more males, than females, with poor knowledge of hypoglycemic symptoms, is an important one. The findings of this study highlights the importance of health education of diabetic subjects in order to be able to recognize the symptoms of hypoglycemia and deal with it in an effective way. There is indeed considerable success in teaching diabetic to use body cues and circumstances to increase the awareness about hypoglycemia,¹⁴ but that comes, of course, after knowing what those symptoms are.

The limitations of this study is that some variables, such as the measure of compliance with treatment used, might be of low assessing value, but that is also not within the objective scope of the study.

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