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Research Article

Hypoglycemia Fear and Self-efficacy of Turkish Patients Receiving Insulin Therapy

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SUMMARY

Purpose: The purpose of this study was to determine hypoglycemia fear and self-efficacy levels of patients receiving insulin and the factors affecting these levels.
Method: In total, 345 diabetic patients who met the inclusion criteria participated in this descriptive, correlational study. Patients were invited to participate in the study during their regular visits to the diabetes outpatient clinic of Istanbul University, Istanbul Medicine Faculty. Data were collected using a patient-information form as well as the Hypoglycemia Fear Survey and Confidence in Diabetes Self-care Scale.
Results: It was found that patients who had type 1 diabetes, received intensive insulin therapy and experienced more frequent and severe hypoglycemia had more hypoglycemia worry and fear. It was also determined that patients who had type 1 diabetes and received intensive insulin therapy had higher self-efficacy levels than patients who had type 2 diabetes and received conventional therapy.
Conclusion: The effects of experiences of frequent and severe hypoglycemia in patients with diabetes emphasize the need for programs that support diabetes-specific self-efficacy and also guide and teach hypoglycemia prevention.

Introduction

Insulin is indispensable for patients with type 1 diabetes, and it becomes indispensable in time for patients with type 2 diabetes due to the progressive nature of pancreatic beta cell failure. However, paradoxically, although insulin treatment brings many benefits, it causes hypoglycemia, which is the most common and feared complication of diabetes (Akram, Bjergaard, Carstenen, Borch-Johnsen, & Thorsteinsson, 2006; Davis & Alonso, 2004; Donnely et al., 2005; Stotland, 2006). The effectiveness of insulin therapy in delaying the onset and reducing the progress of diabetes complications in patients with type 1 and type 2 diabetes was proven by the Diabetes Complications and Control Trial (DCCT Research Group, 1993) and the United Kingdom Prospective Diabetes Study (UKPDS, 1998), respectively. However, the DCCT demonstrated that strict glycemic control caused a three-fold increase in the number of hypoglycemic events in patients with type 1 diabetes, and the UKPDS established that the incidence of hypoglycemia increased significantly in patients with type 2 diabetes receiving insulin therapy.

Hypoglycemia is practically a part of life for individuals with type 1 diabetes and individuals with long-term type 2 diabetes (Brisco & Davis, 2006). It is also known as a main barrier to achieving glycemic goals (Brisco & Davis; Cox, Irvine, Gonder-Frederick, Nowacek, & Butterfield, 1987; Cryer, 2002; Cryer, Davis, & Shamoon, 2003; Gabriely & Shamoon, 2004; Murata, Duckworth, Shah, Wendel, & Hoffman, 2004; Wild et al., 2007; Yale et al., 2001). In particular, severe and recurrent hypoglycemia leads to fear of hypoglycemia, which negatively affects diabetes adherence and metabolic control. Patients with high hypoglycemia fear may engage in behaviors such as overeating, taking less insulin than required or limiting daily-life activities (e.g., exercising, driving, shopping, visiting friends) in order to avoid hypoglycemia. However, these types of coping strategies lead to poor metabolic control and increase the risk of health problems related to diabetes and psychosocial difficulties (Cox et al., 1987). The signs and symptoms of hypoglycemia differ from one individual to another (Davis & Alonso, 2004). Factors such as old age, long diagnosis period and the existence of complications impair hypoglycemia awareness. Studies have determined that 33% of individuals with diagnosis periods longer than 15 years have hypoglycemia unawareness (i.e., they are unaware of the signs and symptoms of hypoglycemia). This has been found to increase the risk of serious hypoglycemia, which increases hypoglycemia fear (Cox et al.; Davis & Alonso; Frier, 2008; Geddes, Wright, Zammit, Deary, & Frier, 2007). Kubiak, Hermanns, Schreckling, Kulzer and

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Haak (2006) found that 20–30% of individuals with type 1 diabetes had impaired hypoglycemia awareness. In particular, patients who experience sudden hypoglycemic attacks worry about losing control, experiencing hypoglycemia while alone or sleeping or making a mistake or having an accident during an attack (Cox & Gonder-Frederick, 1992; Frier, 2008). Because they might not have time to treat their hypoglycemia and might lose consciousness suddenly, hypoglycemia has the potential to be life threatening.

Self-efficacy reflects individuals' ability to make behavioral changes in order to adapt to chronic conditions and improve self-care abilities (Van der Ven, Weinger, Pouwer, Ader, & Van der Ploeg, 2003). Sigurdardottir (2005) states that self-efficacy is a powerful predictor of a person's perceived self-care. Studies of patients with type 2 diabetes demonstrated that greater self-efficacy predicted better nutrition and medication management, more frequent self-monitoring of blood glucose and enhanced physical activity (Dutton et al., 2009; King et al., 2010). While higher levels of self-efficacy have been seen as an indicator of better diabetes control, lower levels have been seen as an indicator of worse diabetes control (Glasgow, Tooberth, & Gilette, 2001). Wu, Lee, Liang, Wang and Tung (2011) determined that a program aimed at improving the self-efficacy of patients with type 2 diabetes was effective in terms of short-term self-management. A research suggested that patients who reported hypoglycemia fear might actively attempt to avoid hypoglycemia by maintaining higher than optimal glucose levels (Irvine, Cox, & Gonder-Frederick, 1992). Experiencing frequent or severe hypoglycemic attacks that lead to unconsciousness might be related to lower self-efficacy levels regarding self-care behaviors. Thus, this study aimed to determine hypoglycemia fear and self-efficacy levels of patients receiving insulin, and the factors affecting these levels.

Method

Setting and sample

The study sample consisted of 345 patients who were using insulin and admitted to the Diabetes Outpatient Clinic of the Department of Endocrinology and Metabolism Disease at Istanbul Medical Faculty, Istanbul University. Each day, approximately 80 patients attend this outpatient clinic, which is open 3 days a week. However, due to various reasons (e.g., meetings, congress, holidays), the outpatient clinic is closed for 4 weeks of the year. Thus, approximately 10,560 patients with diabetes attend this outpatient clinic in a year. As the general control period of the group was three months, 2,500-3,000 patients with diabetes were being cared for and controlled in a year. With a power analysis using a 95% confidence interval (CI), 50% hypoglycemia fear and self-efficacy level sample size was determined to be 333.

Data were collected between October 2007 and May 2008. During this period, the researchers reached 378 patients that met the inclusion criteria. However, because of incomplete data, 33 of the forms were not included in the study, thus bringing the total number to 345. Face-to-face interviews were conducted with the patients who were waiting for their appointments with the physician, diabetes nurse or dietitian. Suitable patients were invited to a private room before or after their appointment. Patients who were able to fill out the forms filled the forms themselves and asked questions when they needed; for those who wished to participate the study but had vision problems or were too weak to read and write, a researcher verbally presented the questions and completed the forms according to the patient's responses. Each interview lasted for 20 minutes.

Inclusion criteria were as follows: being 18 years or older, having a diagnosis period of at least 1 year, having type 1 or type 2 diabetes, using insulin, literate, able to fill out the forms and willingness to participate in the study. Patients who had psychiatric disorders defined in the *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (American Psychiatric Association, 1994) criteria were not included.

Instruments

The patient information form developed by the researchers included both sociodemographic (e.g., age, income level, education, employment status) and diabetes-related (e.g., diabetes type, diagnosis year, medication, complications) questions.

For the Hypoglycemia Fear Survey (HFS; Cox et al., 1987) and the Confidence in Diabetes Self-care Scale (CIDS; Van der Ven et al., 2003), the original developers of the instruments were contacted and asked for permission to translate these scales into Turkish. The above instruments were translated into Turkish and back-translated into English. The original and back-translated English versions of the instruments were assessed by the researchers and a team composed of professionals working closely with patients with diabetes, including clinical and academic nurses, physicians and psychologists. When semantic differences between the two instruments were found, the Turkish versions of the instruments were revised and retranslated. After repeating the process until the instruments were deemed acceptable, readability was tested with five patients with diabetes mellitus before the final versions of the instruments were considered ready to use.

HFS, developed by Cox et al. (1987), is a 33-item questionnaire with two subscales that measure (a) behaviors aimed at avoiding hypoglycemia and its negative consequences and (b) worries about hypoglycemia and its negative consequences. Responses are made on a 5-point Likert scale where 0 means *never* and 4 means *always*. Both subscales were used in this study, and higher scores indicated increased fear of hypoglycemia. Internal consistency reliability (Cronbach's alpha) for the behavior subscale, worry subscale and total HFS was found to be .77, .91 and .90, respectively.

CIDS, developed by Van der Ven et al. (2003), is a 20-item scale that assesses diabetes-specific self-efficacy and the perceived ability to perform diabetes self-care tasks. Each item is rated on a 5-point Likert scale ranging from 1 (*No, I am sure I cannot*) to 5 (*Yes, I am sure I can*). A total CIDS score is calculated by summing all item scores, with higher scores indicating higher self-efficacy. Internal consistency reliability for this scale was found to be .82.

The metabolic control of the patients was determined by looking at the most recent records of the parameters (e.g., fasting/postprandial glucose, glycosylated hemoglobin, chronic complications and lipid levels). Insulin regimens were reported as conventional therapy for patients who received insulin one or two times a day, intensive therapy for patients who received insulin three or more times a day.

Ethical considerations

In order to conduct this research, permission had to be obtained from the Department of Endocrinology and Metabolism Disease of Istanbul University, Istanbul Medical Faculty. Ethical approval was granted by the Ethics Committee of Istanbul University, Istanbul Medical Faculty. Patients who met the inclusion criteria were invited to participate in the study. Following this, the aim of the study was explained, and verbal consent was obtained.

Data analysis

Data analysis was performed using SPSS (version 11.5; SPSS Inc., Chicago, IL, USA). Descriptive statistics, means, medians, frequencies