



ORIGINAL ARTICLE

Impaired awareness of hypoglycaemia in subjects with type 1 diabetes. Results of an online survey in a diabetes web site



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KEYWORDS

Hypoglycaemia;
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Abstract

Objective: To assess the frequency of impaired awareness of hypoglycaemia (IAH) using a specific questionnaire (Spanish version) in a free access diabetes-related web site.

Methods: Data from a free access Spanish version of the Clarke test previously uploaded to the website of the *Fundación para la Diabetes* (March 2014–January 2015) were assessed. In addition to the eight questions in Clarke's questionnaire, information on type of diabetes, age, and disease duration was obtained. The Clarke test divided participants into three categories: normal awareness, uncertain and IAH.

Results: Of the 418 participants with type 1 diabetes, 51.2% were aged 36–55 years. In 34.7%, diabetes had been diagnosed >15 years before, while disease duration was <2 years in 11%. According to Clarke categories, 23.4% had IAH, 15.3% uncertain awareness, and 61.3% normal awareness. The longer the duration of diabetes, the higher the Clarke test score. According to the Clarke test, 14.1% of participants had experienced at least one episode of severe hypoglycaemia in the previous year, and half of these (7.4%) had suffered severe hypoglycaemia two or more times. All but one of the participants with two or more episodes of severe hypoglycaemia had IAH.

Conclusions: Our study shows that the rate of IAH using an online survey is similar (25%) to that previously reported in other geographical areas, increases with diabetes duration, and identifies subjects prone to severe hypoglycaemia.

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PALABRAS CLAVE

Hipoglucemia;
Hipoglucemia
desapercibida;
Diabetes mellitus tipo
1

Hipoglucemia desapercibida en personas con diabetes tipo 1. Resultados de una encuesta "on line" en una Web de diabetes

Resumen

Objetivo: Determinar la frecuencia de hipoglucemia desapercibida (HD) en una amplia cohorte de pacientes adultos con diabetes tipo 1 (DT1) a través de un cuestionario específico disponible para ser rellenado en la Web de manera voluntaria.

Metodología: Desde marzo de 2014 a enero de 2015 se recogieron los resultados del cuestionario en lengua española de percepción de la hipoglucemia para adultos con DT1 (Test de Clarke versión en castellano) disponible *on-line* en la página Web de la Fundación para la Diabetes. Además, la encuesta *on-line* incluía datos sobre el tipo de diabetes, la edad y el tiempo de evolución de la enfermedad. La puntuación final del cuestionario cataloga a los pacientes en 3 categorías: percepción normal, indeterminada y anormal-HD ante una situación de hipoglucemia.

Resultados: De los 418 participantes con DT1 el 51,2% tenía una edad entre 36-55 años. En el 34,7% la DT1 la diabetes tenía una duración > 15 años y en el 11% menos de 2 años. De acuerdo con el resultado del cuestionario de Clarke, un 23,4% de los pacientes presentaba una HD, un 15,3% una percepción indeterminada y en el 61,3% el resultado fue normal. A mayor duración de la DT1, mayor puntuación del cuestionario. El 14,1% de los participantes había tenido una hipoglucemia grave durante el año anterior y la mitad de ellos (7,4%) había presentado ≥ 2 episodios. De estos últimos todos, excepto uno, presentaban HD.

Conclusión: Como en estudios precedentes realizados en otras áreas geográficas, nuestro estudio demuestra que casi una cuarta parte de los pacientes con DT1 tiene alterada la capacidad para percibir los síntomas de hipoglucemia. Esta anomalía es más frecuente conforme aumenta la duración de la enfermedad, e identifica las personas en riesgo de presentar hipoglucemia grave.

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Introduction

Hypoglycaemia is the most relevant adverse event related to insulin treatment.^{1,2} Repeated episodes of hypoglycaemia in subjects with type 1 diabetes (T1D) may result in failure to recognize hypoglycaemia symptoms and signs at a physiologically normal threshold.³ Impaired awareness of hypoglycaemia (IAH) may occur in up to 20–25% of individuals with T1D and the lack of warning symptoms places them at high risk for severe hypoglycaemia (SH).^{4,5} In addition, both IAH and SH represent the main limiting factor to achieve optimal beneficial glycaemic control precluding its beneficial effects.⁶

In order to identify IAH, different questionnaires and self-report measures are being used in clinical practice.^{7,8} Among these, despite some limitations, the Clarke test is one of the most frequently used, providing detailed assessment of IAH.⁷ This test encompasses eight questions regarding exposure to hypoglycaemia and a subjective estimation of the glycaemic threshold for the generation of symptoms and signs. The use of the Clarke questionnaire which was conceived in English requires its validation in a different language before its use in clinical practice and research purposes in non-English speaking populations.

We recently conducted and published the psychometric validation of the Clarke questionnaire in two different languages, Spanish and Catalan.⁹ In our study, we sought to evaluate the frequency of IAH using the Spanish version

of the Clarke test in a free access diabetes-related web portal.

Patients and methods

We collected (March 2014–January 2015 inclusive) anonymous data from a free access Spanish version of the Clarke test previously uploaded in the website of the *Fundación para la Diabetes* (http://www.fundaciondiabetes.org/encuestas/box_encuesta_clarke.htm). This is a free access web portal for patients and health care professionals. In addition to the eight questions included in the questionnaire, on a previous page we asked for information regarding the type of diabetes (T1D, T2D, other types of diabetes, I do not know), age (four categories: 18–35; 36–55; 56–65 and >65 years old), and duration of the disease (five categories: <2; 2–5; 5–10; 10–15 and >15 years). In the Clarke Test a score <3 designates normal awareness; 3 indicates uncertain awareness and >4 designates IAH (Table 1). According to the Clarke test, severe hypoglycaemia is defined as episodes where the patient is unconscious or had a seizure and needed glucagon or intravenous glucose.

Results are presented as mean \pm SD or %. Comparisons were performed using the Student's *t*-test or an ANOVA for repeated measurements. Comparisons between proportions were made with a Chi-square test. A *p* value <0.05 was considered statistically significant. All statistical calculations

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