

REVIEW ARTICLE

Social vulnerability and hypoglycemia among patients with diabetes



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Abstract Lower-income populations are hit harder by the diabetes epidemic as regards both prevalence and the risk of complications. Food Insecurity is one of the mechanisms through which poverty may predispose people with low socio-economic status to poorer control and higher complication rates. The United Nations Food and Agriculture Organization defined food security as “the right to have access to sufficient nutritional and culturally acceptable food choices.” Adults suffering from diabetes with limited income have a 40% greater chance of having food insecurity and an inadequate blood glucose control. Such patients have a two-fold greater risk of developing severe hypoglycemia. In addition, several studies have shown that social vulnerability resulting from food insecurity, low socioeconomic status, low educational levels, and poor health education is an independent risk factor for hypoglycemia, even after conventional predictors are controlled. This review analyzes the literature available on social vulnerability as a non-conventional risk factor for development of hypoglycemia in diabetic subjects.

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PALABRAS CLAVE

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Vulnerabilidad social e hipoglucemia en pacientes con diabetes

Resumen La epidemia de diabetes afecta de manera especial a las poblaciones de menores ingresos, aumentando no solo su prevalencia sino también el riesgo de complicaciones. Entre los mecanismos por los cuales la pobreza podría predisponer a las personas de bajo nivel socioeconómico a un mal control de su enfermedad, se encuentra la inseguridad alimentaria. La seguridad alimentaria es definida por la Organización de Naciones Unidas para la Alimentación y

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la Agricultura como “el derecho de todas las personas a tener una alimentación cultural y nutricional adecuada y suficiente”. Los adultos con diabetes que no cuentan con suficientes ingresos para llevar una dieta saludable tienen una probabilidad un 40% mayor de presentar un control glucémico inadecuado. Estos pacientes tienen además un riesgo al menos dos veces mayor de presentar hipoglucemias severas. Según los estudios publicados hasta la fecha, la vulnerabilidad social que representa la inseguridad alimentaria, el bajo nivel socioeconómico, el bajo nivel de instrucción y la pobre educación sanitaria, ha demostrado ser un factor de riesgo independiente para hipoglucemia, aun después de controlar los predictores convencionales. El objetivo de este artículo es analizar la literatura existente sobre vulnerabilidad social como factor de riesgo no convencional de hipoglucemia.

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Introduction

It is estimated that approximately 415 million people worldwide suffer from diabetes, 77% of them, live in low-medium income countries.¹ The prevalence of diabetes in Argentina is 9.8%, being greater in lower-income than in higher-income groups (10.3% vs 7.3%).² Lower-income populations are hit harder by the diabetes epidemic, not only in prevalence but also on the risk of complications.³⁻⁵ Food Insecurity is one of the mechanisms by which poverty may predispose people with low socio-economic status to worse control and higher rates of complications. In 1974 the United Nations Food and Agriculture Organization (FAO) defined food security as “the right to have access to sufficient nutritional and culturally acceptable food choices.”⁶ According to the latest data from the Social Debt Observatory of the Argentine Catholic University (Observatorio de la Deuda Social Argentina (ODSA), Universidad Católica Argentina, UCA), which analyzed over a period of five years (2010–2014) reported that more than 1 out of 10 households are at risk of suffering from nutritional problems due to economic reasons. In 2014 the prevalence of food insecurity among households located in the country’s main urban centers was 13.8%.⁷ Since the 2000s, the association between food insecurity and chronic diseases such as type 2 diabetes in households is well described, and is 50% higher compared to households with food security.⁸ Adults suffering from diabetes with limited income have 40% greater chance of having food insecurity and an inadequate glycemic control. In such patients, the risk of developing severe hypoglycemia is twice greater.⁹ In addition, several studies have shown that social vulnerability resulting from food insecurity, low socioeconomic status, low schooling and poor sanitary education is an independent risk factor for hypoglycemia, even after conventional predictors are controlled.¹⁰ In fact, low socioeconomic status confers a risk of hypoglycemia similar to that attributed to insulin use.¹¹

The global frequency of hypoglycemia varies considerably among studies, being greater in patients with type 1 diabetes (T1D) than in patients with type 2 diabetes (T2D).¹²⁻¹⁴ In the Diabetes Control and Complications Trial (DCCT), patients in the intensive arm had a 65% incidence of severe hypoglycemia, compared with 35% in the conventional group. In the UK Diabetes Prospective Study, the rates of major hypoglycemic episodes were 0.7% in the conventional group, 1.4% in the glibenclamide group, and 1.8% in

the group treated with insulin.¹² Conventional risk factors for hypoglycemia are related to absolute or relative insulin excess due to excessive doses of antidiabetic medication, skipping meals, physical exercise, alcohol intake, and kidney failure, among others.¹⁵ These factors, however, account for a minority of cases of severe hypoglycemia, of which, asymptomatic hypoglycemia is a result of defective counterregulation and strict glycemic control.¹⁵⁻¹⁷ Little is known about non-conventional risk factors such as the role of social vulnerability as a cause of hypoglycemia in patients with diabetes. Therefore, this review analyzes the existing literature on social vulnerability as a non-conventional risk factor for the development of hypoglycemia in diabetic individuals.

Material and methods

A systematic search was carried out from 1991 to 2015 on peer review manuscripts listed in PubMed, MedLine, Cochrane Library and LILACS using the following search terms: hypoglycemia risk factors, hypoglycemia and food insecurity, hypoglycemia, socioeconomic level, level of income, unemployment, work, hunger and food insecurity. The search was limited to articles published in English literature in human adults. The exclusion criteria included studies of patients under the age of 15 years and gestational diabetes, case reports, letters, and book chapters.

A total of 81 titles and abstracts from the electronic search were reviewed. After applying exclusion and inclusion criteria, 17 articles were selected (1 systematic review, 3 prospective, 4 retrospective, 5 cross-sectional, 1 cohort, 1 case-control, and 2 post hoc studies).

Hypoglycemia and social vulnerability

Social vulnerability is defined as the reduced ability or inability of a person or groups of people to respond to (in the sense of cope with, recover from, or adapt to) any external stresses or pressures placed on their livelihoods and well-being.¹⁸ The degree of vulnerability of individuals, groups of people or communities depends on a number of factors, ranging from individual demographic (age, gender, level of education) and household characteristics (household composition, lifecycle, socio-economic and occupational status, poverty situation) to macro-indicators (development level, economic and social contexts).¹⁸ The concurrence of

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