



Research Paper

Patients with type 1 diabetes in Sweden experience more fatigue than the general population



Johan Segerstedt, Robert Lundqvist, Mats Eliasson*

Department of Public Health and Clinical Medicine, Sunderby Research Unit, Umeå University, Umeå, Sweden

ARTICLE INFO

Article history:
Received 8 April 2015
Received in revised form
15 June 2015
Accepted 17 June 2015

Keywords:
Type 1 diabetes
Complications
Fatigue
Epidemiology

ABSTRACT

Aims: Type 2 diabetes has been linked to fatigue, but results on type 1 diabetes are ambiguous. Our aim was to determine if type 1 diabetes is associated with fatigue and whether the fatigue is due to complications or to the disease itself.

Methods: The Multidimensional Fatigue Inventory (MFI-20), was submitted to all 435 adult patients with type 1 diabetes in the National Diabetes Register at the Sunderby Hospital clinic and to a control group of 2500 persons. The participation rate was 62% in both groups.

Results: Type 1 diabetes was associated with greater fatigue, with a 1.4-point difference (0.9–1.9, 95% CI) in *general fatigue* on a scale of 4–20. Type 1 diabetes was an independent predictor of fatigue, as were cardiovascular and cerebrovascular disease. Women with long diabetes duration but without complications experienced more fatigue than women in the general population (difference in *general fatigue* = 2.5, $p = 0.021$), whereas men showed no significant difference.

Conclusions: Type 1 diabetes is associated with greater fatigue, partly ascribed to vascular disease. Type 1 diabetes of long duration might be associated with fatigue regardless of classical complications, but further research is needed to confirm results.

© 2015 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Introduction

Type 1 diabetes is a chronic condition prevalent in about 30 000 people in Sweden [1]. The consequences of the condition vary among patients – common complications include nephropathy, diabetic foot disease, retinopathy, ischemic heart disease (IHD), and stroke. Possible effects upon quality of life, cognition and vitality are little studied.

Fatigue is defined by Medical Subject Headings (MeSH) as “[t]he state of weariness following a period of exertion, mental or physical, characterized by a decreased capacity for work and reduced efficiency to respond to stimuli.” However, fatigue can be defined in many ways [2], and the definition above seems applicable primarily to healthy individuals. Amongst individuals with a disease, fatigue might be experienced as tiredness at rest, lack of endurance or loss of vigor [3]. Associations have been found between fatigue and several chronic conditions, including multiple sclerosis (MS) [4], chronic obstructive pulmonary disease (COPD) [5], systemic lupus

erythematosus (SLE) [6], rheumatoid arthritis (RA) [7], and cancer [8]. Type 2 diabetes and the metabolic syndrome are also associated with fatigue [9]. Fatigue could be the consequence of disturbances in cognition.

Both type 1 and type 2 diabetes have been linked to cognitive decrements [10]. Studies on fatigue amongst type 1 diabetic patients are scarce and ambiguous: Pediatric type 1 diabetic patients showed more fatigue than their healthy peers in a 2009 study [11]. Amongst adults, one small study indicated that type 1 diabetes is not associated with increased fatigue [12]. However, a larger study from 2013 found a significant association between type 1 diabetes and fatigue [13]. Patients even reported fatigue as the most troublesome diabetes-related symptom. The prevalence of fatigue amongst patients with type 1 diabetes is most likely influenced by both lifestyle and the psychological stress related to the burden of living with a chronic condition [14]. Stroke and IHD, two possible complications of type 1 diabetes, have been linked to fatigue [15–17].

Our main aim was to determine if fatigue is more common amongst patients with type 1 diabetes than in the general population. A secondary aim was to determine whether a possible difference in fatigue might be related to complications or type 1 diabetes itself.

* Corresponding author. Department of Medicine, Sunderby Hospital, 971 80 Luleå, Sweden. Tel.: +46 920 28 20 00; fax: +46 920 2834 02.
E-mail address: mats.eliasson@nll.se (M. Eliasson).

Material and methods

Design

In a cross-sectional study, a questionnaire was distributed to all patients over 18 years of age with type 1 diabetes registered in the Swedish National Diabetes Register (NDR) at the Section of Endocrinology, Department of Medicine, Sunderby Hospital – a sample of convenience consisting of 435 persons. That clinic follows all patients with type 1 diabetes, classification was determined by the treating clinician, in the cities of Luleå and Boden, with an approximate catchment area of 100 000. The patients receiving the questionnaire comprised an estimated 90% of all patients with type 1 diabetes in the area.

Data were collected from August 2012 to August 2014. The questionnaire was sent out by mail, and by the end of the specified time frame, non-responders still living in the county were contacted by telephone and asked about their intention to participate in the study. Between May and August 2014, the questionnaire was also available at doctors' and nurses' appointments. Information about diabetes duration and complications was retrieved from patients' medical records. The registered complications included nephropathy (microalbuminuria, macroalbuminuria, end-stage renal disease – ESRD), IHD, stroke (amongst the patients also including transient ischemic attack – TIA), retinopathy (defined as laser treated retinopathy), diabetic foot disease (including neuropathy with or without pain) and amputation.

The reference group consisted of participants in the 2014 Northern Sweden MONICA population survey, which primarily investigated cardiovascular disease in relation to public health and socioeconomic factors. The study was carried out in a manner similar to the previous six surveys, which started in 1986 [18]. Each survey included 2500 people between 25 and 74 years of age in the counties of Norrbotten and Västerbotten, and that included the cities of Luleå and Boden. Since MONICA is a population survey, some people with diabetes were included in the reference group. We did not exclude these.

In addition to comparing the groups above, patients with none of the aforementioned complications but with 30 years or more of diabetes duration were also analyzed separately from other diabetes patients. The cut-off age was chosen according to ongoing the PROLONG study at Lund University, investigating mechanisms protecting against diabetes complications.

Instruments

The questionnaires contained the Multidimensional Fatigue Inventory (MFI-20) and background questions concerning sex, age and smoking habits. The reference group was also asked about previous or current cardio- and cerebrovascular disease. The MFI-20 consists of 20 questions and measures fatigue on five subscales: general fatigue, physical fatigue, reduced activity, reduced motivation and mental fatigue [19]. Each subscale ranges from 4 to 20, with higher scores indicating more fatigue. The Swedish translation of MFI-20 has been previously accepted for scientific purposes [20].

Statistical analyses

To investigate any difference in fatigue between the patients and the control group, MFI-20 scores were compared using independent samples *t*-test. Differences between groups are denoted by Δ . When comparing small groups, the Mann–Whitney *U* test was used (stated in the results).

Table 1

Number of participants and participation percentage in the patients and control group according to age

Age	MONICA	Patients	MONICA	Patients
	<i>n</i>		Participation rate	
18–34	239	60	48%	41%
35–44	290	52	58%	66%
45–54	340	59	68%	74%
55–64	362	44	72%	70%
65–81	326	51	65%	80%

Using data from all patients and controls, linear regression was performed with *general fatigue* as dependent variable and type 1 diabetes, IHD, stroke, age, sex and daily smoking as independent variables. Factors previously linked to fatigue or with large differences between the groups were included in a linear regression model including the control group and patients with 30 years or more of diabetes duration but without major complications. Investigated independent factors were sex, age, smoking, IHD, stroke and type 1 diabetes.

Statistical analyses were performed with IBM SPSS Statistics (version 22). All confidence intervals (CI) are 95%. Given regression model coefficients are unstandardized. If any participant failed to answer a question, which resulted in a missing value, the participant was excluded from that particular analysis, but included in other analyses that did not require the variable in question. For none of the fatigue dimensions was the rate of missing values higher than 2.4 percent.

This study was approved by the Regional Ethics Review Board at Umeå University, Sweden. All participants were provided with information in writing and consented to taking part in the study.

Results

A total of 268 patients with type 1 diabetes and 1557 subjects from the control group (MONICA) participated in the study, resulting in a participation rate of 62% in each group (Table 1). Participation frequencies varied with age: the lowest rate was found amongst the youngest patients, whereas the oldest patients were more prone to participate. The participation rate did not differ between patients and controls according to gender (60% among men and 63.5% among women). The mean age was about the same in both groups, while the percentage of women was lower amongst the patients. The frequencies of IHD and stroke were also higher amongst the patients (Table 2).

Fatigue scores in all dimensions were significantly higher amongst the patients than in the control group (Table 3). When

Table 2

Characteristics of participants, means (SD) or percentages. Patients with type 1 diabetes and the control group from the MONICA study

Characteristics	MONICA <i>n</i> = 1557	Patients <i>n</i> = 268
Age (years)	50.8 (13.8)	48.0 (16.1)
Women	51.6%	46.6%
Daily smokers	7.8%	6.0%
IHD	4.6%	9.0%
Stroke	2.4%	3.7%
Foot disease	N/A	18.9%
Amputation	N/A	1.1%
Nephropathy	N/A	16.1%
Laser treated retinopathy	N/A	25.2%
Diabetes duration (years)	N/A	26.4 (15.0)
Age of onset (years)	N/A	21.6 (14.3)

Download English Version:

<https://daneshyari.com/en/article/2804038>

Download Persian Version:

<https://daneshyari.com/article/2804038>

[Daneshyari.com](https://daneshyari.com)