Contents available at ScienceDirect

Diabetes Research and Clinical Practice

journal homepage: www.elsevier.com/locate/diabres

International Diabetes Federation

Prevalence, correlates and management of type 2 diabetes mellitus in Lebanon: Findings from a national population-based study

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ARTICLE INFO

Article history:
Received 4 November 2013
Received in revised form
5 May 2014
Accepted 15 June 2014
Available online 23 June 2014

Keywords:
Type 2 diabetes mellitus
Lebanon
Prevalence
Management
Complications

ABSTRACT

Aims: This study aims to examine the prevalence, associated risk factors and complications of diabetes, as well management and preventive care in Lebanon, a small, middle-income country of the Mediterranean region.

Methods: Using a comprehensive multi-dimensional questionnaire, a cross-sectional national survey of 2195 Lebanese adults aged ≥25 years was conducted based on the WHO STEPwise guidelines. The outcome variable, diabetes, was self-reported. Measures for diabetes management included frequency of blood glucose testing and regular eye and foot exams. Macrovascular and microvascular complications were also recorded.

Results: The prevalence of type 2 diabetes was 8.5% (95%CI = 7.3–9.7). Factors associated with an increased risk of having diabetes were: being divorced or widowed (OR = 2.56; 95%CI = 1.07–5.42) compared to single, being obese (OR = 1.50, 95%CI = 1.00–2.57), and having a family history of diabetes (OR = 3.40;95%CI = 2.48–5.19). Vigorous physical activity significantly decreased the odds of diabetes (OR = 0.42; 95%CI = 0.24–0.72). Diabetes management and self-care goals were as follows: 82% were not measuring their blood sugar via dextro on a daily basis, 64.2% did not have a foot exam within the past year, and 52.4% did not obtain the recommended yearly eye exam. The most common complications included heart disease (27.8%) and retinopathy (16.6%).

Conclusions: Prevalence of diabetes in Lebanon was comparable to that found in the West, yet remained lower than estimates in other resource-rich neighboring countries. Adherence to management and self-care measures was sub-optimal resulting in high complication rates. Contextual factors play a role in increasing diabetes risk. Population-based interventions to enhance and promote self-management behaviors are essential to improve complication rates.

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http://dx.doi.org/10.1016/j.diabres.2014.06.005
0168-8227/

1. Introduction

Type 2 diabetes mellitus is a worldwide public health problem with serious morbidity, mortality and economic burdens. Global estimates for 2013 suggest that the number of people with type 2 diabetes is 382 million, and this number is projected to increase to 592 million by 2035 [1,2] with over 80% of the rise in the number of adults with type 2 diabetes occurring in low and middle income countries [2]. This dramatic growth is related to lifestyle changes associated with globalization and urbanization.

Type 2 diabetes mellitus is also an important cause of morbidity and mortality in the Middle East and North Africa Region (MENA), which currently has the highest global comparative prevalence of diabetes, ranging from 8% to 24% [1,2]. By 2035, the number of adults with diabetes in this region will double to almost 67.9 million [1]. The MENA region as a whole has also seen an increase in cardiovascular risk factors, including physical inactivity and obesity rates, further contributing to the diabetes epidemic [3]. Lebanon, a small middle-income country of the MENA region, is experiencing rapid urbanization, economic transition, population growth and ageing. These factors, coupled with high rates of obesity [4], physical inactivity [5] and metabolic syndrome [6], have placed Lebanon at the forefront of the epidemiological transition, with non-communicable diseases, notably diabetes, emerging as the leading cause of morbidity and mortality [7].

Both the American Diabetes Association (ADA) and the International Diabetes Federation (IDF) consider self-management to be a core component of diabetes care [1,8]. Adequate diabetes management emphasizes behavior change, including adherence to medications, self-monitoring of blood glucose levels, regular screening for microvascular (neuropathy, nephropathy, retinopathy) and macrovascular (cardiovascular and peripheral vascular disease) complications, and proper education about nutrition [8,9]. Yet, a recent systematic review by Zabetian and colleagues conducted in the MENA region [10] found that, among people with diabetes, over half do not meet the recommended care targets, with diabetes complications being common outcomes. Furthermore, studies on management of type 2 diabetes across the region and Lebanon, remain small in size and scarce [10,11]. Similarly, studies that examine complications arising from diabetes are limited and, when present, are restricted to hospital settings [12]. Using data from a recent national population-based survey in Lebanon, this study aims to examine:

(1) The prevalence and associated factors of type 2 diabetes mellitus; (2) preventive care and management targets being performed by adults with diabetes; and, finally, (3) the extent of complications arising from diabetes.

2. Methods

2.1. Study design and participants

The data for this study were drawn from the national Nutrition and Non-Communicable Disease Risk Factor (NNCD-RF) survey conducted in Lebanon between 2008 and 2009 in a representative sample of Lebanese adults of both sexes. This was a population-based cross-sectional survey that followed the WHO STEPwise guidelines and approach to chronic disease risk factor surveillance for obtaining core and expanded data on established risk factors for NCDs [13]. The study sample was drawn based on random area probability multi-stage cluster sampling: the strata were the Lebanese Governorates, the clusters were selected at the level of districts, urban and rural, and the housing units constituted the primary sampling units in the different districts. Only one adult from each household was selected, excluding pregnant and lactating women and individuals with mental disabilities. The original study sample included 2836 adults aged 18 and above. However, for the purpose of this paper and comparability with other national [14] and regional studies [15,16], and to differentiate between those who have type 1 diabetes mellitus, with younger age of onset than those who have type 2 diabetes mellitus, we focus in our analysis on the 2195 adults aged 25 and above. The protocol of the original NNCD-RF study was approved by the Institutional Review Board of the American University of Beirut and all subjects gave informed consent for their participation. Further details on the design and conduct of this survey are published elsewhere [17].

2.2. Measures

2.2.1. Definition of diabetes, its management and complications

Diabetes status was ascertained if the participants responded positively to the following question: ''Have you ever been told by a health professional that you have diabetes?'' Those who reported as having diabetes were further queried about measures of diabetes management. The recommended management targets, according to the IDF [1] and the ADA [8,9], comprise of the following main guidelines: clinical monitoring of blood glucose control every 2–6 months depending on glycemic stability; self-monitoring of blood glucose via dextro once to twice daily depending on stability; and obtaining annual eye and foot exams after first test done at time of diagnosis. This is in addition to following a diet, performing physical activity and regular medication use. As such, persons with diabetes participants were further asked about frequency of blood glucose test during the past 12 months prior to the survey, frequency of testing blood sugar via dextro (coded as daily, weekly, monthly or less frequently), frequency of having a regular eye check (coded as within past month, year, or two or more years), and foot exam (coded as once or more or never within the past year). Self-reports of complications of hyperglycemia, classified into macrovascular complications (coronary artery disease, peripheral arterial disease, and stroke) and microvascular complications (nephropathy, neuropathy, and retinopathy), were also obtained.

2.2.2. Health-related indicators

Health indicators comprised of behavioral factors and co-morbidity. Behaviors included cigarette smoking, alcohol consumption and physical activity (PA). To assess physical