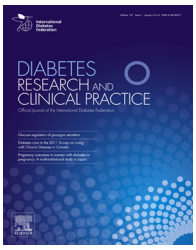
Contents available at ScienceDirect

Diabetes Research and Clinical Practice

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

International Diabetes Federation



Brief Report

The glycemic status of diabetes in an urban area of Cambodia

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ARTICLE INFO

Article history:
Received 11 February 2014
Received in revised form
11 February 2014
Accepted 11 February 2014
Available online 19 February 2014

Keywords:
Diabetes mellitus
Cambodia
Korea

ABSTRACT

Recently the Korea Diabetes Association participated in the 'Cambodia-Korea Twinning Project' to help Cambodia establish its own modernized diabetes center and to raise awareness of the seriousness of diabetes. Here we report the status of diabetes in an urban area of Cambodia as obtained through this project.

1. Introduction

The burden of chronic diseases is increasing worldwide, especially among poorer people in many countries, and patient needs have remained largely unmet [1]. In the case of diabetes, one of the most common chronic diseases, the International Diabetes Federation estimates that the total number of people with diabetes will climb from 382 million in 2013 to 592 million by 2035 [2]. Asia is emerging as the epicenter of this epidemic due to its large population and rapid economic growth [3].

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http://dx.doi.org/10.1016/j.diabres.2014.02.008

Cambodia, a tropical country in the Asia-Pacific region, is one of these countries affected by the epidemic and is has a huge social and economic burden due to diabetes and its complications [4]. However, reliable and up-to-date data on the status of diabetes care in Cambodia is lacking. Recently, the Korean Diabetes Association embarked on the 'Cambodia-Korea Twinning Project', which aimed to help Cambodia establish its own modernized diabetes center and to raise awareness of the seriousness of diabetes and its complications with the guidance and cooperation of International Diabetes Federation-Western Pacific Region (IDF-WPR). Here we report the status of diabetes in an urban area of Cambodia participating in this project.

2. Subjects and methods

We conducted this survey in Phnom Penh, the capital of Cambodia, while providing care for subjects with diabetes during the Cambodia-Korea Twinning Project. This report includes data on 1289 Cambodians with diabetes (444 men and 845 women, mean age 56.9 ± 9.8 years) whose capillary fasting blood glucose (FBG), random blood glucose (RBG), and/or hemoglobin A1c (HbA1c) levels were measured during December 14–16, 2012. All patients visited the established diabetes clinic at the national Kossamack Hospital. During this study, a diabetes specialist team of 15 physicians, 3 educators and 45 volunteers participated in the treatment of Cambodians with diabetes and in offering an education program for locally registered diabetes educators.

Blood concentrations of FBG, RBG and HbA1c were measured on site with point-of-care (POC) devices (Accu-Check Active, Roche Diagnostics, Mannheim, Germany, for FBG or RBG; NycoCard HbA1c test, Axis-shield, Oslo, Norway, for HbA1c). All devices have acceptable performance and were standardized to national references. The device for HbA1c measurement has National Glycohemoglobin Standardization Program (NGSP) certification for POC measurements. FBG or RBG concentrations were measured in all subjects visiting the diabetes clinic and HbA1c was measured only when FBG or RBG exceeded (11.1 mmol/l (200 mg/dl) because of limited resources. All subjects were interviewed by local physicians before being examined at the clinic. The local physicians provided information regarding the medications the patients were currently taking. Subjects currently taking diabetes medications were considered to have diabetes. Those reporting a previous diagnosis of diabetes but no history of diabetes medications underwent FBG, RBG, and HbA1c testing and patients with results outside the normal range were classified as having diabetes. Subjects who were taking insulin treatment were excluded from this survey since we could not provide insulin. They received treatment by a local physician during this project.

Height (m), weight (kg), and body mass index (BMI, weight in kilograms divided by the square of height in meters) were recorded.

3. Results

Table 1 shows the clinical and biochemical characteristics of the surveyed population. The mean age and BMI of the subjects were 56.9 ± 9.8 years and 24.3 ± 5.2 kg/m^2, respectively. The median duration of diabetes was 5.0 years. Regarding glycemic measurements, the mean FBG and RBG were 10.5 ± 5.3 mmol/l and 14.7 ± 6.7 mmol/l, respectively. The median HbA1c levels were 8.6%. Most subjects (91.0%) were taking oral hypoglycemic agents. There were no statistically significant differences in patient characteristics between males and females other than age.

Fig. 1 shows the proportion of subjects attaining the recommended HbA1c target (i.e., less than 7%) [5]. The vast majority of surveyed subjects (82.9%) failed to reach the HbA1c target (Fig. 1A). An analysis of the distribution of HbA1c found that about a quarter of all subjects (25.5%) had HbA1c levels greater than 10.0% (Fig. 1B). The results were similar even when the analysis was performed only on the subjects who were currently taking medications for diabetes (data not shown).

Table 1 – Clinical and biochemical characteristics of the surveyed subjects according to sex.

	Total (n = 1289)	Men (n = 444)	Women (n = 845)	P-value
Age (years)	56.9 ± 9.8	55.9 ± 10.5	57.4 ± 9.4	0.008[a]
BMI (kg/m^2)	24.3 ± 5.2	24.6 ± 7.0	24.1 ± 3.9	0.173[a]
Duration of diabetes (years)	5.0 (2.0–10.0)	5.0 (2.0–10.0)	5.0 (2.0–9.0)	0.143[b]
Currently treated for diabetes (%)	91.0	91.6	90.6	0.608[c]
FBG (mmol/l)	10.5 ± 5.3	10.8 ± 5.2	10.4 ± 5.4	0.609[a]
RBG (mmol/l)	14.7 ± 6.7	14.7 ± 6.6	14.8 ± 6.7	0.917[a]
HbA1c (%)	8.6 (7.4–10.0)	8.6 (7.3–10.0)	8.6 (7.5–10.0)	0.649[b]
HbA1c (mmol/mol)	70 (57–86)	70 (56–86)	70 (58–86)	0.649[b]

Data are expressed as the mean ± SD or median (and interquartile range) for continuous variables and as proportions (%) for categorical variables. Data for FBG, RBG, and HbA1c were available in 171, 1108, and 785 subjects, respectively. BMI; Body mass index, FBG; Fasting blood glucose, RBG; Random blood glucose, HbA1c; hemoglobin A1c. All statistical analyses were performed using SPSS version 18.0 for Windows (SPSS Inc., Chicago, IL, USA). A two-tailed P-value less than 0.05 was considered statistically significant.

[a] Student's t-test.

[b] Mann–Whitney U test.

[c] Chi-squared test were used.