FI SEVIER

Contents lists available at ScienceDirect

Journal of Diabetes and Its Complications

journal homepage: WWW.JDCJOURNAL.COM



Risk factor differences between type 2 diabetes patients with ischemic cerebrovascular versus coronary heart diseases at admission



Ying Yang ^{a,1}, Biao Huang ^{b,1}, Shuangquan Tan ^b, Hongbing Chen ^b, Yicong Chen ^b, Chao Dang ^b, Gang Liu ^b, Yuhua Fan ^b, Jian Yu ^b, Jinsheng Zeng ^{b,*}

- ^a Department of Neurology, The First People's Hospital of Yunnan Province, Kunming 510032, China
- ^b Department of Neurology and Stroke Center, The First Affiliated Hospital, Sun Yat-Sen University, Guangzhou 510080, China

ARTICLE INFO

Article history:
Received 16 January 2015
Received in revised form 3 April 2015
Accepted 22 April 2015
Available online 28 April 2015

Keywords:
Type 2 diabetes mellitus
Ischemic cerebrovascular diseases
Coronary heart diseases
Risk factors
At admission

ABSTRACT

Aims: Type 2 diabetes mellitus (T2DM) is a major risk factor, and shares many common risk factors with ischemic cerebrovascular diseases (ICVD) and coronary heart diseases (CHD). Few studies have directly compared the differences in common risk factors between T2DM patients with ICVD and CHD at admission. *Methods*: In this cross-sectional study, T2DM patients with or without first-ever ICVD or CHD admitted to our hospital over 3 years were enrolled. Patients' data were retrospectively collected and compared using multivariate logistic regression analyses.

Results: In total, 1208 T2DM patients were enrolled (57.5% men). The median age was 59 years (interquartile range [IQR] 51–69), and duration of diabetes was 7 years (IQR 3–10). Two hundred and two patients (16.7%) were diagnosed with ICVD, 345 (28.6%) with CHD, and 661 (54.7%) had neither ICVD nor CHD. Compared with T2DM patients without ICVD or CHD, ICVD and CHD patients had higher systolic blood pressure (SBP) and older age but lower high-density lipoprotein cholesterol levels (all p < 0.01), whereas reduced estimated glomerular filtration rate was only associated with CHD (p < 0.05). Furthermore, ICVD patients had higher SBP (every 10-mmHg increase, OR = 1.38, 95% CI: 1.26–1.51) and HbA1c levels (OR = 1.18, 95% CI: 1.06–1.31) than CHD patients.

Conclusions: T2DM patients with ICVD and CHD have differences in common risk factors at admission. Higher systolic blood pressure and HbA1c levels may indicate ICVD.

© 2015 Elsevier Inc. All rights reserved.

1. Introduction

Diabetes is a major risk factor for ischemic cerebrovascular diseases (ICVD) and coronary heart diseases (CHD). In a meta-analysis including 698,782 participants, the adjusted hazard ratio among participants with diabetes was 2.27 for ischemic stroke and 2.00 for CHD compared with the group without diabetes (Sarwar et al., 2010). Cardiovascular and cerebrovascular diseases are the leading causes of death and disability among type 2 diabetes mellitus (T2DM) patients, accounting for more than half of mortality (Fox et al., 2007). In China, the leading cause of death during 1990–2010 was stroke (1.7 million deaths), followed by ischemic heart diseases (948,700 deaths) (Yang et al., 2013). Calculating the risks of cerebrovascular and cardiovascular diseases has become increasingly important for the appropriate

management of T2DM (American Diabetes Association, 2012; Rydén et al., 2013). A 2012 systematic review identified 12 risk prediction models from prospective studies specifically conducted for T2DM patients (Van Dieren et al., 2012). The majority of these risk factors are derived from Caucasian populations. Stroke and CHD have each only been evaluated in a single study in Chinese T2DM patients from the Hong Kong Diabetes Registry (Yang et al., 2007; Yang et al., 2008). Furthermore, many investigators have evaluated total cardiovascular events as a heterogeneous group, without separation into subgroups according to disease type. A retrospective study from Italy investigated the risk factors for different types of macrovascular complications in 1199 T2DM patients and concluded that age and waist circumference were associated with cerebrovascular diseases, whereas higher diastolic blood pressure (BP) and lower high-density lipoprotein cholesterol (HDL-c) levels were associated with coronary artery diseases (Papa et al., 2013). However, to the best of our knowledge, no study has directly compared the differences in risk factors between T2DM patients with ICVD and CHD at admission. Besides hyperglycemia, T2DM patients usually have hypertension and dyslipidemia, which are common risk factors for ICVD and CHD (Chen, McAlister, Walker, Hemmelgarn, & Campbell, 2011; Ji et al., 2013). The

Conflict of interest: None.

^{*} Corresponding author at: Department of Neurology and Stroke Center, The First Affiliated Hospital, Sun Yat-Sen University, No.58 Zhongshan Road 2, Guangzhou 510080, China. Tel.: $+86\ 20\ 87755766\ 8253$; fax: $+86\ 20\ 87335935$.

E-mail address: zengjs@pub.guangzhou.gd.cn (J. Zeng).

¹ These authors contributed equally to this work.

aim of the present study was to investigate the differences in these common risk factors at admission between T2DM patients with ICVD and CHD, providing more information for appropriate and individualized management of T2DM patients.

2. Materials and methods

2.1. Study population

In this cross-sectional study, T2DM patients admitted to The First Affiliated Hospital of Sun Yet-sen University between January 1, 2011 and December 31, 2013 were enrolled. The diagnosis of T2DM was based on 1999 World Health Organization criteria (WHO) (Alberti & Zimmet, 1998). The patients' discharge diagnosis was a very important reference for patients enrolling. The following inclusion criteria were used: age >18 years; duration of diagnosed T2DM >1 year; first-ever occurrence of ICVD or CHD; and onset time of ICVD or CHD ≤2 weeks. The patients with cerebrovascular diseases and CHD simultaneously were excluded. T2DM patients without ICVD/ CHD, who served as comparison group, were enrolled from those admitted to the Department of Endocrinology for complete medical evaluation of diabetes, including potential complications. The exclusion criteria also included the following: secondary diabetes; prior history of defined cerebrovascular diseases and CHD; comorbid acute complication of diabetes; current glucocorticoid therapy; and history of cancer, liver cirrhosis, and end-stage renal diseases. The data were retrospectively collected from medical records. This study was approved by the Ethics Committee of the First Affiliated Hospital of Sun Yet-sen University. The requirement of informed consent was waived by the committee because the study consisted of a retrospective review of medical records.

2.2. Evaluation of ischemic cerebrovascular diseases and coronary heart diseases

ICVD included first-ever transient ischemic attack (Easton et al., 2009) and non-fatal ischemic stroke. Ischemic stroke was defined as a sudden onset of focal or global neurological deficits of presumed vascular origin persisting ≥24 h, consistent with WHO criteria (Thorvaldsen, Asplund, Kuulasmaa, Rajakangas, & Schroll, 1995). The diagnosis of ICVD was based on clinical findings as well as brain computed tomography (CT) and/or magnetic resonance imaging results. Brain CT was performed for all patients with cerebrovascular diseases to exclude hemorrhagic stroke. Cases involving cerebral tumor or metastasis or secondary to trauma were not considered.

CHD included first-ever angina and non-fatal myocardial infarction. The diagnosis was determined on clinical symptoms and signs, diagnostic electrocardiographic changes, and cardiac biomarker levels (including cardiac troponin I, troponin T, and creatine kinase-MB) according to American Heart Association guidelines (Luepker et al., 2003). Ninety-five percent of CHD patients underwent coronary angiography, and endoluminal treatment was performed when necessary.

2.3. Clinical and laboratory data collection

Clinical and laboratory data on admission were retrospectively collected. Body mass index (BMI) was calculated as weight divided by height squared (kg/m²). BP was measured twice at admission using a standard mercury BP over a 1-min interval. The mean value of the 2 measurements was used for analysis. Hypertension was defined as BP ≥140/90 mmHg or current antihypertensive treatment (Chobanian et al., 2003). Fasting blood samples were taken for measurement of serum creatinine (SCr); glycosylated hemoglobin A1c (HbA1c); and lipid levels including total cholesterol (TC), triglycerides (TG), HDL-c, and low-density lipoprotein cholesterol (LDL-c). All biochemical parameters were evaluated with standard laboratory procedures. The estimated glomerular

filtration rate (eGFR) was calculated using the chronic kidney diseases epidemiology collaboration (CKD-EPI) formula: eGFR $=141\times$ min (SCr/ $\kappa,1)^{\alpha}\times$ max (SCr/ $\kappa,1)^{-1.209}\times0.993^{\rm age}\times1.018$ (if female), where κ was 0.7 for females and 0.9 for males, α was -0.329 for females and -0.411 for males, min was the minimum of SCr/ κ or 1, and max was the maximum of SCr/ κ or 1 (Levey et al., 2009). Reduced eGFR was defined as eGFR < 60 mL/min/1.73 m². An electrocardiogram was routinely recorded. The medical history, current smoking and drinking status, hypoglycemic agents, antihypertensive therapy, and statin therapy were obtained from medical records.

2.4. Statistical analysis

The data were tested for normality using the Kolmogorov-Smirnov test, which indicated non-normal distribution for all continuous variables. Data are presented as medians with interquartile ranges (IQR, 25th-75th percentile) for continuous variables and proportions for categorical variables. In univariate analyses, a 2-sided nonparametric Mann-Whitney U test was used for continuous variables and chi-square test for categorical variables where appropriate. Multivariate binary logistic regression analysis was used to assess: (1) the related factors of T2DM patients with ICVD in reference to patients without ICVD or CHD; (2) the related factors of T2DM patients with CHD in reference to patients without ICVD or CHD; and (3) the differences in common risk factors between T2DM patients with ICVD and CHD. Adjusted odds ratio (OR) and 95% confidence interval (CI) were obtained after adjustment for the factors meeting a threshold probability value of 0.05 in the univariate analyses. The threshold for statistical significance was p < 0.05. Data analyses were performed using SPSS version 19 for Windows (Chicago, IL, USA).

3. Results

In total, 1208 T2DM patients were enrolled, and 57.5% were men. Patients' median age was 59 years (IQR 51–69), and median duration of diabetes was 7 years (IQR 3–10). The proportion of patients >60 years of age was 49.8%. Two hundred and two patients (16.7%) were diagnosed with ICVD, 345 (28.6%) with CHD, and 661 (54.7%) had neither ICVD nor CHD. The clinical characteristics of the enrolled patients and the results of univariate analyses are shown in Table 1.

3.1. Factors related to ischemic cerebrovascular diseases and coronary heart diseases at admission of T2DM patients

In multivariate logistic regression analyses, compared with patients without ICVD or CHD, higher systolic BP (SBP; every 10-mmHg increase, OR = 1.78, 95% CI: 1.59–1.98), older age (every 5-year increase, OR = 1.25, 95% CI: 1.14–1.36), and lower HDL-c levels (OR = 0.33, 95% CI: 0.15–0.71) were associated with ICVD in T2DM patients. Reduced eGFR (<60 mL/min/1.73 m², OR = 1.78, 95% CI: 1.10–2.88), older age (every 5-year increase, OR = 1.36, 95% CI: 1.26–1.46), higher SBP (every 10-mmHg increase, OR = 1.13, 95% CI: 1.04–1.23), and lower HDL-c levels (OR = 0.20, 95% CI: 0.11–0.38) were associated with CHD (Table 2).

3.2. Differences in related factors at admission between T2DM patients with ischemic cerebrovascular diseases and coronary heart diseases

The median onset times of ICVD and CHD were 5 days (3-9) and 5 days (2-9) (p>0.05), Mann–Whitney U test), respectively. The detailed characteristics of patients with ICVD and CHD are shown in Table 1. In univariate analyses, the T2DM patients with ICVD had higher systolic and diastolic BP and higher levels of HbA1c, eGFR, and HDL-c at admission than CHD patients. No significant differences in age, sex, BMI, T2DM duration, medical history, and TC, TG, or LDL-c levels were observed between the 2 groups.

Download English Version:

https://daneshyari.com/en/article/5902255

Download Persian Version:

https://daneshyari.com/article/5902255

<u>Daneshyari.com</u>