Journal of Cardiology (2011) **58**, 116—123

available at www.sciencedirect.com

ScienceDirect

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

Original article

Recent mortality of Japanese patients with atrial fibrillation in an urban city of Tokyo

Shinya Suzuki (MD, PhD)*, Takeshi Yamashita (MD, PhD, FJCC), Takayuki Otsuka (MD), Koichi Sagara (MD), Tokuhisa Uejima (MD), Yuji Oikawa (MD), Junji Yajima (MD), Akira Koike (MD, FJCC), Kazuyuki Nagashima (MD), Hajime Kirigaya (MD), Ken Ogasawara (MD), Hitoshi Sawada (MD, PhD, FJCC), Tadanori Aizawa (MD, PhD, FJCC)

The Cardiovascular Institute, Tokyo, Japan

Received 27 April 2011; received in revised form 3 June 2011; accepted 15 June 2011
Available online 4 August 2011

KEYWORDS
Atrial fibrillation;
Prognosis;
Epidemiologic methods

Summary
Background: In Japan, the recent status of the mortality of atrial fibrillation (AF) patients is still unclear.
Methods and results: We used a single-hospital based cohort database in an urban city (Tokyo) in Japan, including all the new visitors from 2004 to 2009 ($n = 13{,}228$). The non-adjusted death rates of AF patients for all-cause, stroke, and cardiovascular death were 1091, 97, and 727 per 100,000 patient-years, and the age-adjusted ones were 317 (95% CI, 316—318), 16 (95% CI, 16—16), and 238 (95% CI, 237—239), respectively. The age-adjusted relative risk of AF on all-cause mortality was 1.7 in the particular population.
Conclusions: The present study provides the most recent data about the characteristics and the mortality of AF patients in Tokyo, thus serving as the basic information for finding problems to solve regarding Japanese AF patients.

Introduction

Atrial fibrillation (AF) is the most common arrhythmia among the developed countries, and its prevalence almost doubles with each decade of life [1—3] leading up to 25% on a lifetime basis [4]. Several reports have noted that the AF population will greatly increase in the future according to the rise in age of society [3,5,6]. Thus, AF is becoming an epidemiologically important arrhythmia both in Western countries [3] and in Japan [5,6].

Moreover, AF has been known to be an important risk factor for increasing mortality [7,8], and the mortality risk for AF has been identified as approximately 1.5—2 times both in Western countries [7,9] and Japan [10]. Besides, in the

* Corresponding author at: Department of Cardiology, The Cardiovascular Institute, 3-2-19 Nishiazabu, Minato-Ku, Tokyo, ZIP: 106-0031, Japan. Tel.: +81 3 3408 2151; fax: +81 3 3408 2159.
E-mail address: sinsuz-tky@umin.ac.jp (S. Suzuki).

0914-5087/$ — see front matter © 2011 Japanese College of Cardiology. Published by Elsevier Ltd. All rights reserved.
doi:10.1016/j.jjcc.2011.06.006

reports of Western countries, the mortality of AF patients at 1 year after the first diagnosis has been identified as over 10% [7,9].

To improve the mortality of AF, many efforts have been made, including sinus restoration [11], the controlling of heart rate, and the management of accompanying cardiovascular diseases [12,13], including the prevention of stroke [14]. Consequently, several reports clarified that the mortality of AF has improved in the recent two or three decades at least in particular settings [15—19]. This updated information regarding the real-world status of AF patients could provide an aid for finding the next well-directed tasks to solve.

However, in Japan, the recent status of the mortality of AF patients is still unclear because only scarce reports [10,20] have identified the mortality. Besides, it has already been several decades since the previous data have been started [10]. In this situation, we aimed to identify the recent mortality of AF patients in a single hospital-based cohort in an urban city of Japan. Although the population is restricted to a particular setting, the data provide the most recent status regarding the mortality of AF patients in Japan.

Methods

Study patients

The Shinken Database was established comprising all the new patients visiting the Cardiovascular Institute Hospital in Tokyo, Japan (''Shinken'' is an abbreviated name in Japanese for the name of the hospital), and excluded patients with active cancer and any foreign travellers. The principle aim of this hospital-based database is a surveillance of the prevalence and prognosis of cardiovascular diseases in the urban areas of Japan [20]. The registry started in June 2004, and thereafter patients have been continually registered to the database annually.

The data in the present study was derived from this database between June 2004 and March 2010 (Shinken Database 2004—2009) including 13,228 new visiting patients (AF was diagnosed in 1942 patients).

Data collection at initial visit

In each patient, after obtaining an electrocardiogram and chest X-ray, the cardiovascular status was evaluated using echocardiography, an exercise test, 24-h Holter recordings, and blood laboratory data within 3 months after the initial visit, according to the decision by the attending physicians. The information regarding medications was obtained from the hospital database within 3 months after the initial visit. Details have been published elsewhere [20,21].

Patient follow-up

The health status and the incidence of cardiovascular events and mortality are maintained in the database by being linked to the medical records of the hospital, and by study documents of prognosis sent once per year to those who stopped hospital visits or who were referred to other hospitals.

In the present data analysis, the follow-up data after April 1st, 2010 were excluded. Therefore, the end of the follow-up period was defined as one of the following three: (1) the date of death, if the date was prior to March 31st, 2010; (2) the final hospital visit or the final response to our study documents of prognosis with the confirmation of being alive prior to March 31st, 2010; and (3) March 31st, 2010, when the date of death, the final hospital visit, or the final response to our study documents of prognosis were later than April 1st, 2010.

Ethics

The ethical committee at the Cardiovascular Institute granted ethical permission for this study and all the patients gave written informed consent.

Definition of AF

In the present study, AF was diagnosed by electrocardiographic recordings, including 12-lead surface electrocardiograms and 24-h Holter recordings within the 3 months after the initial visit, and by the medical history of AF from the referring physicians. New-onset AF later than 3 months after the initial visit was not included in the diagnosis of AF in the present study.

Diagnosis of death

We confirmed deaths of study patients by the medical records of our hospital or by the information obtained from follow-up. Deaths from stroke (both of ischemic and haemorrhagic) and cardiovascular diseases were defined when the causes of death were classified into ICD 10 code numbers of I60-I69 and I00-I99, respectively [10].

Statistical analysis

In the patients' background, the categorical and consecutive data are presented as number (%) and mean $\pm$ standard deviation, respectively. The chi-square test was used for the group comparison, and the unpaired *t*-test and the one-way analysis of variance were used for the comparison of the consecutive variables between 2 groups and more than 2 groups, respectively. The crude death rates of AF patients were compared with those of non-AF patients, calculating the relative risk and the 95% confidence intervals both in the total population and in the separated age-stratifications.

Thereafter, the age-adjusted death rates of AF patients were calculated using the Japanese standard population model of 1985. Then, age-adjusted relative risks were calculated using the Mantel-Haenszel method adjusted by age categories.

These analyses were performed using SPSS (SPSS Inc., Chicago, IL, USA) for Windows (Microsoft Corp., Redmond, WA, USA), version 14.0 software. Statistical significance was set at two-sided *p*-value of <0.05.