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Differences in the Clinical Characteristics of Ethnic Minority Groups With Heart Failure Managed in Specialized Heart Failure Clinics

Diana Choi, PhD,* Edson Nemi, MD,† Carlos Fernando, MD,† Milan Gupta, MD,†‡§ Gordon W. Moe, MD†§

ABSTRACT

OBJECTIVES The purpose of our study was to compare the clinical features of Chinese and South Asians, the 2 largest minority populations in Canada, with non-Chinese/non-South Asian (NCH/NSA) patients managed in common social macroenvironments and healthcare systems.

BACKGROUND Heart failure is an increasingly prevalent condition. Although ethnic minorities comprise a growing proportion of the population in Western countries, the clinical profiles of ethnic minorities with heart failure are largely unknown.

METHODS We analyzed records of patients with heart failure managed in 2 specialized clinics in Ontario, Canada. Of the 1,671 patients, 181 (11%) were identified as Chinese and 215 (13%) as South Asian.

RESULTS Our analyses showed that fewer Chinese patients were found to have a history of myocardial infarction (MI) (30% vs. 52%), 3 occluded/stenosed coronary vessels on angiogram (47% vs. 51%), grade 3 or worse left ventricular dysfunction (22% vs. 42%), and a prescription of angiotensin-converting enzyme inhibitors (42% vs. 63%) compared with their NCH/NSA counterparts. In contrast, South Asian patients more frequently had a past history of an MI (70% vs. 52%), 3 occluded/stenosed coronary vessels on angiogram (68% vs. 51%), and treatment with coronary revascularizations (55% vs. 40%) compared with NCH/NSA patients.

CONCLUSIONS Our study demonstrates important differences in comorbid conditions, clinical characteristics, and treatment patterns among Chinese and South Asian patients compared with NCH/NSA patients with heart failure. Awareness of these differences will help to develop differential strategies necessary to prevent and manage heart failure among ethnic minority groups. (J Am Coll Cardiol HF 2014;2:392–9) © 2014 by the American College of Cardiology Foundation.

Heart failure is a major global health concern as it leads to significant morbidity and mortality. Over 23 million people worldwide live with heart failure (1), and its prevalence continues to rise, in part due to the aging population and advances in treatment of cardiovascular diseases leading to better survival (2–4). Historically, investigations in the field of cardiovascular diseases have predominantly been focused on white populations. With the rapid rise in the numbers of ethnic minorities and enhanced diversity in western countries, including the United States, United Kingdom, and Canada, awareness of the differences in cardiovascular diseases and its risk factors between ethnic groups has become increasingly important.

From the *Faculty of Medicine, University of Toronto, Toronto, Ontario, Canada; †Division of Cardiology, Department of Medicine, St Michael's Hospital, University of Toronto, Toronto, Ontario, Canada; ‡Division of Cardiology, McMaster University, Hamilton, Ontario, Canada; and the §Keenan Research Center in the Li Ka Shing Knowledge Institute, St Michael's Hospital, Toronto, Ontario, Canada. This study was supported by the Mandarin Buffet through a designated grant program of the Heart and Stroke Foundation of Canada. All authors have reported that they have no relationships relevant to the contents of this paper to disclose.

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There is accumulating evidence to suggest that different ethnic groups may have differential risk factors and etiologies for their heart failure (5–10). Studies from the United States have shown that African-Americans have a higher incidence of heart failure than individuals of other ethnic groups, and the etiology of heart failure is less likely to be coronary artery disease (CAD) compared with their white counterparts (11,12). South Asians (SAs) were found to be at increased risk of developing heart failure due to premature CAD (13), whereas the leading cause of heart failure in the Chinese population was thought to be hypertension (14,15). Furthermore, studies in the United Kingdom showed that hospital admission rates for heart failure and presence of diabetes were higher in SA patients than white patients (16). Although prior studies have suggested different risk profiles among ethnic groups, little is known regarding the clinical profiles of ethnic minority groups with a confirmed diagnosis of heart failure. These published studies have attempted to identify differential risk profiles among ethnic groups; however, the results must be interpreted with caution due to the limitations of relying solely on administrative data. Despite these limitations, epidemiological studies on heart failure are a key to driving future prospective studies.

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A large proportion of the population in Canada is comprised of visible minorities, which has surpassed 5 million people, or 16% of the overall population (17). Although prior studies have suggested different coronary risk profiles among ethnic groups, little is known regarding the clinical profiles of ethnic minority groups with a confirmed diagnosis of heart failure. With SA and Chinese populations being the first and second largest visible minority groups in Canada, respectively (17), the objective of this present study was, therefore, to compare the clinical characteristics of these 2 ethnic groups with non-Chinese/non-South Asian (NCH/NSA) patients managed in 2 specialized heart failure clinics in Ontario, Canada.

METHODS

STUDY POPULATION. Detailed patient medical records from January 1, 2000, to January 31, 2011, were obtained and reviewed from 2 specialized heart failure clinics in Ontario, Canada (St. Michael's Hospital and William Osler Health System) for this cross-sectional study. Both clinics follow and manage large numbers of Chinese and SA patients with heart failure.

Our cohort of 1,671 patients was comprised of Ontario residents age 19 years or older that were treated at either of the 2 clinics with a confirmed diagnosis of heart failure. In the event of missing ethnicity data in the medical records, 2 previously-validated lists of SA (including individuals from India, Sri Lanka, Pakistan, and Bangladesh) and Chinese surnames were used to identify the ethnicity of the patients (18,19). Using surname lists, Shah et al. (19) demonstrated a positive predictive value of 89.3% and 91.9% for SA and Chinese surnames, respectively. All other individuals, the great majority of whom were white patients, were grouped as the comparison group comprised of NCH/NSA patients. The patients were categorized into 3 groups: Chinese, SA, and NCH/NSA.

DATA COLLECTION. Patient age and sex were obtained as demographic data. In the medical history of each patient, we identified the presence or absence of CAD, angina symptoms, myocardial infarction (MI), valvulopathy, valve surgery, and coronary artery bypass graft (CABG) surgery/percutaneous coronary intervention (PCI). Prevalence of risk factors and relevant comorbid conditions, including hypertension, diabetes mellitus, dyslipidemia, peripheral vascular disease, chronic obstructive pulmonary disease, cancer, stroke, kidney disease, and ethanol consumption, were also determined. Finally, use of medical devices, including implantable cardioverter-defibrillators (ICD) and pacemakers, were documented.

Using echocardiographic data, we analyzed left ventricular ejection fraction (LVEF) and right ventricular systolic pressure. Furthermore, we categorized the patients' left ventricular (LV) function into LVEF ≥45% and LVEF <45%, and for the purposes of this study, we only examined the differences in the incidence of Grade 3 LV dysfunction (30% to 39% LVEF) or worse severity in our patients. Electrocardiographic (ECG) data were collected to assess for the presence of atrial fibrillation and QRS durations. Angiographic data to examine the number of occluded/stenosed coronary arteries were documented, when available. We also examined laboratory data, including estimated glomerular filtration rate, urea, creatinine, high-density lipoprotein, total cholesterol, and N-terminal pro-B-type natriuretic peptide (NT-proBNP) levels (pg/ml), when available.

Finally, the medications that the patients were prescribed for treatment of their heart failure were recorded; these included diuretics, digitalis, angiotensin-converting enzyme (ACE) inhibitors,

ABBREVIATIONS AND ACRONYMS

ACE = angiotensin-converting enzyme

ARB = angiotensin II receptor blocker

CABG = coronary artery bypass graft

CAD = coronary artery disease

ECG = electrocardiographic

ICD = implantable cardioverter-defibrillator

LVEF = left ventricular ejection fraction

MI = myocardial infarction

NCH/NSA = non-Chinese/non-South Asian

NT-proBNP = N-terminal pro-B-type natriuretic peptide

PCI = percutaneous coronary intervention

SA = South Asian