Journal of the American Society of Hypertension 8(4) (2014) 246–253

Research Article

Characteristics of hypertension subtypes and treatment outcome among elderly Korean hypertensives

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Manuscript received November 5, 2013 and accepted January 6, 2014

Abstract

There are limited data about characteristics of hypertension subtypes in Asian hypertensive patients and their impacts on treatment of hypertension. This prospective, multi-center, observational study evaluated 2439 hypertensive patients. (≥60 years) Inadequately controlled and drug-naïve patients were categorized into three hypertension subtypes (isolated systolic hypertension [ISH], combined systolic/diastolic hypertension [SDH], and isolated diastolic hypertension [IDH]), and proportions of each hypertension subtype were evaluated. After 6-month strict treatments, we compared the characteristics of patients who did not achieve target BP with those who did. In overall population, ISH was the most common subtype (53.2%; 1297/2439). However, in drug-naïve patients, SDH was the predominant hypertension subtype (59.6%; 260/436). Notably, the proportion of ISH was substantially lower than previously known data. Predictors associated with failure of reaching target BP were old age (>70 years), hypertension awareness, and baseline systolic blood pressure (≥160 mm Hg) for total patients. In drug naïve patients, hypertension awareness, ISH, and microalbuminuria were associated with

Funding sources: The HIT registry is sponsored by Sanofi, Korea.

Conflict of Interest: The authors have no financial or institutional conflicts of interest.

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http://dx.doi.org/10.1016/j.jash.2014.01.004

treatment failure. These findings might have an impact on the evaluations and antihypertensive treatments of elderly Korean patients. J Am Soc Hypertens 2014;8(4):246–253.

Keywords: Elderly; isolated systolic hypertension; hypertension awareness.

Introduction

Aging is one of the major risk factors for vascular diseases. Earlier studies have demonstrated steep increases of hypertension, atherothrombotic stroke, and coronary heart disease with advancement in age.[1–3] Among these changes of vascular diseases, characteristics of hypertension in the elderly are known to be different from those of young adults. According to epidemiological studies of hypertension, the pattern of blood pressure (BP) changes with age. Hypertension subtypes in young adults aged below 50 years are known to be predominantly combined systolic and diastolic hypertension (SDH) or isolated diastolic hypertension (IDH); whereas, in elderly people aged 60 years or above, isolated systolic hypertension (ISH) is regarded as overwhelmingly predominant hypertension subtype.[3–5] The change of hypertension subtypes is thought to be due to vascular aging or vascular stiffness. The changes of arterial walls due to aging are well reported, and comprise luminal enlargement with wall thickening and reduction of elastic properties of large arteries.[6] As a result of vascular remodeling, ISH is characterized by increased vascular stiffness and endothelial dysfunction.[7]

When compared with earlier epidemiologic studies in the US such as the Third National Health and Nutrition Examination Survey (NHANES III)[3] and the Framingham study,[4] there is limited data available on hypertension subtypes in Asian countries. Since some earlier epidemiological studies on the prevalence of hypertension in Asian countries[8,9] have intrinsic limitations due to the cross-sectional nature of the studies, little is known about BP control rates according to hypertension subtypes after antihypertensive treatments.

Therefore, we aimed to find the characteristics of hypertension subtypes in elderly Korean hypertensives who visited hypertension clinics for high BP. We investigated the proportion of hypertension subtypes according to age and medical history of taking antihypertensive medications and also evaluated predictive factors related to failure of reaching target BP after antihypertensive drug treatments.

Methods

Study Design

This is a prospective, multi-center, observational registry in which 43 hospitals in Korea participated, encompassing urban and rural areas. Patients were eligible for inclusion if they were ≥60 years of age, had essential hypertension, regardless of past medical history of hypertension, and visited hypertension clinics for high BP. The study excluded patients who were participating in other clinical trials.

At baseline visit, all eligible patients' data on demographic and anthropometric characteristics, hypertension awareness, past antihypertensive treatment, medical history (hyperlipidemia, diabetes mellitus, family history of cardiovascular disease, physical inactivity, and smoking), and target organ damage (microalbuminuria, heart disease, cerebrovascular accident, chronic kidney disease, peripheral artery disease, and retinopathy) were recorded under the guidance of the attending physicians using a previously prepared data collection form. Systolic blood pressure (SBP) and diastolic blood pressure (DBP) were measured in both arms two or three times at intervals of 3 minutes, using automated oscillometric BP devices (HEM 737; Omron Healthcare, Kyoto, Japan)[10] in accordance with official recommendations for BP measurement.[11]

Patients were categorized into the three hypertension subtypes (ISH, SDH, and IDH) at baseline visit, and distribution of each hypertension subtype was compared as per age groups. The extent of BP reduction needed to reach target BP was determined for each hypertensive subtype in both drug-naïve and inadequately controlled groups. Medications of antihypertensive treatment were prescribed at the physicians' discretion. Adherence to medications was ascertained by physicians at each visit. Dose titrations or adjustments of antihypertensive medications were performed strictly at intervals of approximately 1 month.

The patients were followed up to 6 months. Achievement of target BP was evaluated at about 6-month (±8 weeks) visit, and predictive factors associated with treatment failure were analyzed.

The local ethics committee at each hospital approved the use of clinical data for the study, and all patients provided written informed consent.

Definitions of Variables

High BP was defined as SBP ≥140 mm Hg and/or DBP ≥90 mm Hg. The achievement of target BP was defined as SBP <140 mm Hg and DBP <90 mm Hg as a result of pharmacological treatment, in accordance with the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure[12]. Hypertension subtypes were defined as follows: (1) ISH: SBP ≥140 mm Hg and DBP <90 mm Hg; (2) SDH: SBP ≥140 mm Hg and DBP ≥90 mm Hg; and (3) IDH: SBP <140 mm Hg and DBP ≥90 mm Hg.

Hypertension awareness was determined by hypertensive patients responding to the question "Have you ever been