Risk Factor Clustering in Korean Hypertensive Patients

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Hypertension infrequently occurs in isolation from other cardiovascular (CV) risk factors; the Framingham heart study showed that hypertension occurs in isolation less than 10%.¹⁾ It tends to cluster with other atherogenic risk factors (including dyslipidemia, abdominal obesity and diabetes) that accelerate the clinical CV events. Clustering with two or more major risk factors with hypertension occurs more than 50% in the Framingham heart study.¹⁾ Hence, it is important to manage common comorbidities in order to effectively care for hypertension. Therefore, the most national treatment guidelines of hypertension, including Korean guidelines, recommends treating hypertensive patients based on considerations of their comorbid risk factors.²⁾³⁾

Given the high prevalence of comorbidities and their potential consequences in hypertensive patients, there is substantial interest in the actual prevalence and common comorbidities of Korean hypertensive patients. Noh et al.⁴⁾ reported on this issue regarding the prevalence of comorbidities among people with hypertension (n=58423) using data from the Korean National Health and Nutrition Examination Survey from 2007-2013. The authors clearly demonstrated that major chronic conditions (including obesity, diabetes mellitus, dyslipidemia, cardiovascular disease, and chronic

kidney disease) were more prevalent in adults with hypertension than in those without hypertension. Common comorbidities with hypertension were obesity (60.1%), dyslipidemia (57.6%), and impaired fasting glucose (45.1%). Hypertensive patients with two or more comorbid diseases were 42.2% compared to 17.7% in those of normal blood pressure. In a multivariable adjusted model, the odds ratios (95% confidence interval [CI]) of hypertensive subjects compared to those of normal blood pressure for chronic kidney disease, obesity, dyslipidemia, diabetes mellitus and CVD were 3.94 (1.71-9.07), 2.60 (2.43-2.78), 1.74 (1.62-1.88), 2.22 (95% CI 2.02-2.45), and 2.11 (95% CI 1.78-2.50), respectively.

The overall results of this study are in line with previous studies in that the comorbidity proportion of major CV risk factors tended to be highest among hypertensive patients, followed by individuals with prehypertension and normal blood pressure.¹⁾⁵⁾ In this study common clusters of high blood pressure are associated with metabolic risk factors including obesity, diabetes and dyslipidemia. These current epidemic features are suggestive of a pathophysiological link between obesity-related metabolic derangements and high blood pressure in Koreans.

The clustering of risk factors including central obesity, atherogenic dyslipidemia (with low high density lipoprotein-cholesterol, high triglycerides, and small dense low density lipoprotein-cholesterol particles), elevated fasting glucose, vascular inflammation, and elevated blood pressure have been termed as being a metabolic syndrome. Visceral adiposity and insulin resistance appear to play central roles in the risk factor clusters of metabolic syndrome. Subjects with metabolic syndrome also increase the risk of incident CV disease and type 2 diabetes mellitus.⁶⁾ The prevalence of metabolic syndrome is about one-third of the total Korean population.⁷⁾ Korea seems to have experienced a rapid increase in the prevalence of a metabolic syndrome during the 2000s, partly due to increasing adoption of Western lifestyle patterns.

Some limitations of the Noh et al's study should be considered.⁴⁾ First, it was cross-sectional, so cause-effect inferences are difficult to establish for the pathophysiologic mechanism between hypertension and its comorbidities. Second, the working definition

Received: August 9, 2016

Revision Received: September 12, 2016

Accepted: September 13, 2016

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• The author has no financial conflicts of interest.

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of major chronic diseases using this study could be different from the exact diagnostic criteria of each disease. It is possible that they could have been misclassified. Finally, laboratory tests were based on a single determination of serum sample, which is subject to random measurement error and may have underestimated the strength of the associations. Despite some limitations, this is the first report to document risk factor clustering in Korean hypertensive patients using data from the Korean National Health and Nutrition Examination Survey. The present study also implicated that optimal CV protection from hypertensive patients requires more than just simply lowering one's blood pressure. There is evidence that blood pressure control frequently requires the combination of antihypertensive drugs with other therapies, such as aggressive lipid-lowering treatments.

In conclusion, the elevated blood pressure itself confers increased risk for CV events in the absence of risk factors, but total CV risk is greater than the sum of its individual risk factors when concomitant elevated blood pressure and the other components of metabolic risk factors are present.⁸⁾ Therefore, antihypertensive therapy should be tailored to take into account the often associated dyslipidemia, glucose intolerance, obesity and any CV disease condition as well as the character and severity of the individual's high blood pressure.

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