

## Editorial



# Hypertension Control in Young Population: the Earlier, the Better

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### Conflict of Interest

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► See the article “Factors Associated with Awareness, Treatment, and Control Rate of Hypertension among Korean Young Adults Aged 30–49 Years” in volume 50 on page 1077.

Among the global burden of cardiovascular disease, 58% of cardiovascular mortality occurs in Asia and even it is increasing rapidly. Hypertension is the most common, powerful, and modifiable risk factor of the cardiovascular morbidity and mortality in the world. Much evidence supports that hypertension is the most effective risk factor for prevention of future cardiovascular events. Many healthcare policy makers and associated societies are trying to improve the hypertension control rate. But more than 50% of hypertensive patients do not get the target blood pressure (BP) and the control rates are static in recent 10 years. Lowering the diagnostic criteria of hypertension in American College of Cardiology/American Heart Association/American Society of Hypertension (ACC/AHA/ASH) and recommending initial fixed dose drug combination in European Society of Hypertension (ESH) are the mixture of pragmatic and scientific decision. The 2018 recommendation of Korean Society of Hypertension (KSH) is evidence-based but conservative guideline in improving control rate.<sup>1)</sup> The 2020 fact sheet of KSH revealed that the awareness, treatment and control rate of hypertension in young population deserve to pay attention and may be key to improve the control rate.

There are risk factors such as physical inactivity, family history, diabetes, obesity, alcohol, drugs, and psychosocial factors for increasing BP in young population. It is big challenge to keep checking the BP and adhering the management of hypertension in young population because the main goals to control hypertension are preventing future cardiovascular events which mainly occur later half of life. And many researchers and physicians also regard that cardiovascular risk of young hypertensive patients are negligible and hesitate to analyze the risk or start active management of hypertension. Is that true? There are many reports showing that cardiovascular continua are started earlier age and cause premature morbidity and mortality. Osei AD reported that coronary calcification, one of important subclinical target organ damage, increased in 20–30s with traditional cardiovascular risk factors including hypertension.<sup>2)</sup> Kang et al.<sup>3)</sup> reported the burden of coronary artery calcium in young adults with elevated BP. The coronary calcification increased as the BP increase in dose dependent relationship regardless of age and history of hypertension. These relationships between early onset of hypertension and subclinical organ damage extended to left ventricular hypertrophy and diastolic dysfunction by echocardiography and albuminuria.<sup>4)</sup> These findings connected by the cardiovascular events of 18–30 years old population in 25 years follow up study.<sup>5)</sup> At Coronary Artery Risk Development in Young Adults (CARDIA)

study, they reported the population with hypertension had more cardiovascular disease events and all-cause mortality even after adjustment of other risk factors. Recently CARDIA researchers reported that 15-year cumulative BP increased the incidence of heart failure, coronary artery disease and stroke.<sup>6)</sup> Similar findings were reported in Koreans.<sup>7)</sup> Son et al.<sup>7)</sup> analyzed the relationship of high BP with future cardiovascular risk in Korean nationwide cohort. After 10-year follow up observation of 20–39 years old population, there were higher cardiovascular and stroke events in both men and women even in group with BP  $\geq$ 130/80 mmHg. These findings may support the lower BP target in young population. Asians are very active to report the risk of high BP in young. In Evidence for Cardiovascular Prevention from Observation Cohorts in Japan (EPOCH-JAPAN) study,<sup>8)</sup> lifetime risk of stroke death is higher according to the BP and the risk tends to high when the hypertension onset earlier age. It means that early onset hypertension is dangerous for the stroke death than the elderly onset hypertension. The lifetime risk of coronary heart disease death is same as lifetime risk of stroke death. They strongly recommend managing the patients with elevated BP even in age of 35 year-old actively with lifestyle modifications or medications. There was another study to affirming the association of age of onset of hypertension with cardiovascular morbidity and deaths. In Chinese cohort registering 71,245 participants, they compared the future cardiovascular events in group with new onset hypertension and maintaining normal BP for 6.5 years.<sup>9)</sup> The cardiovascular disease and all-cause mortality increased when the onset of hypertension was younger than 45 years old especially stroke regardless of types such as hemorrhage or ischemic.

There are many recommendations for evaluation and management of hypertension from related academic societies. But few guidelines recognize the risk of hypertension in young population and emphasize the active and regular BP monitoring and management with lifestyle modifications and/or medications. It is clear that hypertension in young is overlooked and we need to find out the reasons for irrationally low awareness, treatments, and control rate in the group. Jeon and Kim<sup>10)</sup> have reported the factors associated with the awareness, treatment and control rate of hypertension in young population from the analysis of Korean National Health and Nutrition Examination Survey. The awareness of hypertension in men (33.4%) is much lower than women (43.5%). Men with older age, obesity, diabetes mellitus or cardiovascular disease revealed higher awareness of hypertension. And women who were older age, rural residents, unemployed, having diabetes or dyslipidemia showed higher awareness. There is 4% difference between awareness and treatment rate with bigger differences in men than women and younger than older patients. And there is bigger differences control rate among treatment population between men and women (68.7% in young men, 86.9% in young women). From this analysis, important factors should be considered to develop the strategies to improve the awareness, treatment, and control rate of hypertension especially in young population. The Korean Society of Hypertension has announced the 2020 motto focusing high BP in young population: ‘the earlier, the better’ at the beginning of the year. The jumping up of hypertension control rate in young population needs multi-disciplinary approaches such as 1) regular BP measurement to improve the awareness of hypertension, 2) provide social encouraging system for adherence of hypertension management such as lifestyle modification and medication, 3) multinational or nationwide study to guide the management of hypertension in young such as ‘when start the medications,’ ‘what is the target blood pressure,’ and ‘what is the best strategies to control the blood pressure.’

## REFERENCES

1. Shin J, Cho MC. Updated reasons and clinical implications of new Korean hypertension guidelines for cardiologists. *Korean Circ J* 2020;50:476-84.  
[PUBMED](#) | [CROSSREF](#)
2. Osei AD, Uddin SM, Dzaye O, et al. Predictors of coronary artery calcium among 20–30-year-olds: the Coronary Artery Calcium Consortium. *Atherosclerosis* 2020;301:65-8.  
[PUBMED](#) | [CROSSREF](#)
3. Kang J, Chang Y, Kim S, Sung KC, Shin H, Ryu S. Increased burden of coronary artery calcium from elevated blood pressure in low-risk young adults. *Atherosclerosis* 2019;282:188-95.  
[PUBMED](#) | [CROSSREF](#)
4. Suvila K, McCabe EL, Lehtonen A, et al. Early onset hypertension is associated with hypertensive end-organ damage already by midlife. *Hypertension* 2019;74:305-12.  
[PUBMED](#) | [CROSSREF](#)
5. Yano Y, Reis JP, Tedla YG, et al. Racial differences in associations of blood pressure components in young adulthood with incident cardiovascular disease by middle age: Coronary Artery Risk Development in Young Adults (CARDIA) study. *JAMA Cardiol* 2017;2:381-9.  
[PUBMED](#) | [CROSSREF](#)
6. Nwabuo CC, Appiah D, Moreira HT, et al. Long-term cumulative blood pressure in young adults and incident heart failure, coronary heart disease, stroke, and cardiovascular disease: the CARDIA study. *Eur J Prev Cardiol*. 2020 [Epub ahead of print].  
[PUBMED](#) | [CROSSREF](#)
7. Son JS, Choi S, Kim K, et al. Association of blood pressure classification in Korean young adults according to the 2017 American College of Cardiology/American Heart Association Guidelines with Subsequent Cardiovascular Disease Events. *JAMA* 2018;320:1783-92.  
[PUBMED](#) | [CROSSREF](#)
8. Satoh M, Ohkubo T, Asayama K, et al. Lifetime risk of stroke and coronary heart disease deaths according to blood pressure level: EPOCH-JAPAN (Evidence for Cardiovascular Prevention from Observational Cohorts in Japan). *Hypertension* 2019;73:52-9.  
[PUBMED](#) | [CROSSREF](#)
9. Wang C, Yuan Y, Zheng M, et al. Association of age of onset of hypertension with cardiovascular diseases and mortality. *J Am Coll Cardiol* 2020;75:2921-30.  
[PUBMED](#) | [CROSSREF](#)
10. Jeon YW, Kim HC. Factors associated with awareness, treatment, and control rate of hypertension among Korean young adults aged 30–49 years. *Korean Circ J* 2020;50:1077-91.  
[PUBMED](#) | [CROSSREF](#)