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Editorial

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Lifetime Risk as a Tool to Encourage Young Adults with High Cardiovascular Risk in Asia

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Lifetime risk is long-term absolute risk that indicates the absolute risk of a disease during the remainder of an individual's lifetime[1]. The 10-year risk is commonly used for cardiovascular risk estimation, but it highly depends on subjects' age. For instance, the 10-year risk of coronary heart disease (CHD) could be ≤ 1% even in hypertensive individuals aged 45 years[2]. Based on short-term absolute risks such as 10-year risk, we rarely encourage young individuals with high cardiovascular risk to initiate lifestyle changes or drug treatment. Although the relative risk values could also be available for informing young adults about cardiovascular risk, absolute risk can be more comprehensible information for patients than relative risk[3]. Long-term risk has an important role in public health, particularly in young adults. The U.S. Guideline on the Management of Blood Cholesterol recommends lifetime risk estimation for adolescents and young adults[1].

Lifetime risks of cardiovascular events have been reported in U.S. cohort studies. Lifetime risk of developing a disease in adults aged between 40 and 59 years can be calculated using the risk estimator available on the U.S. website[1]. However, this estimation is based on the U.S. population[1]. CHD is the major type of cardiovascular disease in the U.S. population, whereas stroke mainly accounts for cardiovascular disease in Asian populations. In stage 1 hypertensive men/women, the cumulative risks of developing CHD until the age of 95 years is reported to be 39.6%/28.8%, whereas those of stroke is 11.5%/16.7%[4]. Because absolute risk is generally affected by the regional characteristics of a study population, the lifetime risk estimated for the U.S. population cannot be adopted for Asian populations.

Sugiyama *et al.* reported the lifetime risk of CHD according to LDL and non-HDL cholesterol levels in the Japanese population[5]. The lifetime risks of CHD in 45-year-old men were 13.7% for LDL < 160 mg/dL and 47.2% for LDL ≥ 160 mg/dL in the Suita cohort study[5]. The difference in lifetime risk between low and high LDL groups reached approximately 30%. This information can be useful to persuade men with high cardiovascular risk to change their lifestyle or initiate anti-hypercholesterolemia therapy. Although Sugiyama *et al.* did not observe a clear association between cholesterol levels and lifetime risk of CHD in women, the 40-year risk at the age of 45 years and 30-year risk at the age of 55 years in the high LDL group were double the corresponding values in the low LDL group (8.9% and 9.2% vs. 4.7% and 4.3%, respectively)[5]. Meanwhile, the difference in the cumulative risk of CHD between the low and high LDL groups appeared to reduce when cumulative risks were calculated as lifetime risk (7.2% and 6.9% vs. 10.5% and 10.9%, respectively)[5]. Furthermore, the lifetime risk of CHD at the age of 75 years in both groups was similar. Death from CHD mainly accounted for most CHD events in women aged 75–100 years[5]. The Evidence for Cardiovascular Prevention from Observational Cohorts in Japan (EPOCH-JAPAN) study, a meta-analysis of individual participant data from Japanese multiple cohort studies, indicated that total cholesterol levels were not associated with CHD death in women aged 70–89 years[6]. The low cholesterol levels in old individuals observed in an epidemiological study possibly reflect various influencing factors such as malnutrition and poor general condition. These facts were possibly involved in the lifetime risk of CHD in women in this study[5]. A total cholesterol level of ≥ 260 mg/dL is

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associated with three times CHD risk compared with a total cholesterol level of <180 mg/dL in women[6, 7]. Therefore, high cholesterol levels in women should also not be ignored.

The high LDL group in the previous study[5] could have been associated with a high prevalence of hypertension, which is one of the strongest risk factors for CHD. Although the Suita cohort study provided new insights about CHD risk estimation in Asian populations, further stratification according to risk factors other than cholesterol could not be indicated mainly due to the limited number of events. The results reported in the EPOCH-JAPAN study showed the combined effect of blood pressure and total cholesterol levels on the relative risk of CHD death[8]. Because other risk factors are associated with CHD risk, results stratified based on various risk factors would be needed to establish the lifetime risk of CHD in Asian populations. So far, the Japanese guidelines for the prevention of atherosclerotic cardiovascular diseases[9] or management of hypertension[10] have not focused on lifetime risk. If evidences regarding lifetime risk are accumulated, they can be used to motivate young adults with high cardiovascular risk in Asian populations.

Disclosures

None.

References

1) Grundy SM, Stone NJ, Bailey AL, Beam C, Birtcher KK, Blumenthal RS, Braun LT, de Ferranti S, Faiella-Tommasino J, Forman DE, Goldberg R, Heidenreich PA, Hlatky MA, Jones DW, Lloyd-Jones D, Lopez-Pajares N, Ndumele CE, Orringer CE, Peralta CA, Saseen JJ, Smith SC, Jr., Sperling L, Virani SS, Yeboah J. 2018 AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA Guideline on the Management of Blood Cholesterol: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. J Am Coll Cardiol, 2019; 73: e285-e350
2) Turin TC, Okamura T, Raheen Afzal A, Rumana N, Watanabe M, Higashiyama A, Nakao YM, Nakai M, Takegami M, Nishimura K, Kokubo Y, Okayama A, Miyamoto Y. Impact of hypertension on the lifetime risk of coronary heart disease. Hypertens Res, 2016; 39: 548-551
3) Fortin JM, Hirota LK, Bond BE, O'Connor AM, Col NF. Identifying patient preferences for communicating risk estimates: a descriptive pilot study. BMC Med Inform Decis Mak, 2001; 1: 2
4) Allen N, Berry JD, Ning H, Van Horn L, Dyer A, Lloyd-Jones DM. Impact of blood pressure and blood pressure change during middle age on the remaining lifetime risk for cardiovascular disease: the cardiovascular lifetime risk pooling project. Circulation, 2012; 125: 37-44
5) Sugiyama D, Turin TC, Yeasmin F, Rumana N, Watanabe M, Higashiyama A, Takegami M, Kokubo Y, Okamura T, Miyamoto Y. Hypercholesterolemia and Lifetime Risk of Coronary Heart Disease in the General Japanese Population: Results from the Suita Cohort Study. J Atheroscler Thromb, 2020; 27: 60-70
6) Nagasawa SY, Okamura T, Iso H, Tamakoshi A, Yamada M, Watanabe M, Murakami Y, Miura K, Ueshima H, Evidence for Cardiovascular Prevention from Observational Cohorts in Japan Research Group. Relation between serum total cholesterol level and cardiovascular disease stratified by sex and age group: a pooled analysis of 65 594 individuals from 10 cohort studies in Japan. J Am Heart Assoc, 2012; 1: e001974
7) Sugiyama D, Okamura T, Watanabe M, Higashiyama A, Okuda N, Nakamura Y, Hozawa A, Kita Y, Kadota A, Murakami Y, Miyamatsu N, Ohkubo T, Hayakawa T, Miyamoto Y, Miura K, Okayama A, Ueshima H, Nippon Data Research Group. Risk of hypercholesterolemia for cardiovascular disease and the population attributable fraction in a 24-year Japanese cohort study. J Atheroscler Thromb, 2015; 22: 95-107
8) Satoh M, Ohkubo T, Asayama K, Murakami Y, Sakurai M, Nakagawa H, Iso H, Okayama A, Miura K, Imai Y, Ueshima H, Okamura T, Evidence for Cardiovascular Prevention From Observational Cohorts in Japan Research Group. Combined effect of blood pressure and total cholesterol levels on long-term risks of subtypes of cardiovascular death: evidence for cardiovascular prevention from observational cohorts in Japan. Hypertension, 2015; 65: 517-524
9) Kinoshita M, Yokote K, Arai H, Iida M, Ishigaki Y, Ishibashi S, Umemoto S, Egusa G, Ohmura H, Okamura T, Kihara S, Koba S, Saito I, Shoji T, Daida H, Tsukamoto K, Deguchi J, Dohi S, Dobashi K, Hamaguchi H, Hara M, Hiro T, Biro S, Fujioka Y, Maruyama C, Miyamoto Y, Murakami Y, Yokode M, Yoshida H, Rakugi H, Wakatsuki A, Yamashita S, Committee for E, Committee for Epidemiology Clinical Management of Atherosclerosis. Japan Atherosclerosis Society (JAS) Guidelines for Prevention of Atherosclerotic Cardiovascular Diseases 2017. J Atheroscler Thromb, 2018; 25: 846-984
10) Shimamoto K, Ando K, Fujita T, Hasebe N, Higaki J, Horiuchi M, Imai Y, Imaizumi T, Ishimitsu T, Ito M, Ito S, Itoh H, Iwao H, Kai H, Kario K, Kashihara N, Kawano Y, Kim-Mitsuyama S, Kimura G, Kohara K, Komuro I, Kumagai H, Matsuura H, Miura K, Morishita R, Naruse M, Node K, Ohya Y, Rakugi H, Saito I, Saitoh S, Shimada K, Shimosawa T, Suzuki H, Tamura K, Tanahashi N, Tsuchihashi T, Uchiyama M, Ueda S, Umemura S, Japanese Society of Hypertension Committee for Guidelines for the Management of Hypertension. The Japanese Society of Hypertension Guidelines for the Management of Hypertension (JSH 2014). Hypertens Res, 2014; 37: 253-390