



The importance of observing breakfast intake for prevention of atherosclerosis diseases at its earliest stages

Yasuhiko Kubota¹, Hiroyasu Iso²

¹Osaka Center for Cancer and Cardiovascular Disease Prevention, Osaka, Japan; ²Public Health, Department of Social Medicine, Osaka University Graduate School of Medicine, Osaka, Japan

Correspondence to: Hiroyasu Iso, MD, PhD, MPH. Public Health, Department of Social Medicine, Osaka University Graduate School of Medicine, 565-0871, 2-2, Yamadaoka, Suita, Osaka, Japan. Email: iso@pbhel.med.osaka-u.ac.jp.

Provenance: This is a Guest Editorial commissioned by Editor-in-Chief Xi-Hua Liu, MD (Chinese Research Hospital Association, Beijing, China).

Comment on: Uzhova I, Fuster V, Fernández-Ortiz A, *et al.* The Importance of Breakfast in Atherosclerosis Disease: Insights From the PESA Study. *J Am Coll Cardiol* 2017;70:1833-42.

Received: 27 January 2018; Accepted: 07 February 2018; Published: 20 March 2018.

doi: 10.21037/arh.2018.02.01

View this article at: <http://dx.doi.org/10.21037/arh.2018.02.01>

There is growing evidence to support the saying, “*Breakfast is the most important meal of the day*” (1). Previous studies have reported the associations of skipping breakfast with a low nutritional adequacy of diets (2,3) and cardiovascular disease (CVD) risk factors such as obesity (4), high blood pressure (5), poor lipid profiles (6) and glucose intolerance (7). So far, two prospective cohort studies showed the association between skipping breakfast and increased risk of CVD (8,9). Results from a cohort of male US health professionals showed that participants regularly skipping breakfast had about 30% increased risk of coronary heart disease (8). The second study, conducted in Japan, reported that individuals skipping breakfast had a 14%, 18% and 36% increased risks of total CVD, total stroke and hemorrhagic stroke, respectively (9). In spite of such existing evidence, the prevalence of breakfast intake has been declining over the past 40 years (10), and thus, in order to recommend that people worldwide eat breakfast, it is necessary to continue to accumulate the evidence on the importance of breakfast.

In an article entitled “*The Importance of Breakfast in Atherosclerosis Disease: Insights From the PESA Study*”, published in *the Journal of the American College of Cardiology*, Uzhova *et al.* provided further evidence on the importance of breakfast to health (11). Authors sought to test the hypothesis that skipping breakfast is positively associated with subclinical atherosclerosis, independent of conventional CVD risk factors, using a cross-sectional

study. This cross-sectional study was conducted as a part of the PESA (Progression of Early Subclinical Atherosclerosis) study, an ongoing observational prospective cohort of employees of the Bank Santander Headquarters in Madrid, Spain. The study sample consisted of 4,052 male and female participants, aged 40 to 54 years, without any history of CVD or chronic kidney disease. Participants were asked to choose foods consumed in the past 15 days from the list of 861 food items, taking into consideration eating occasions (breakfast, lunch, dinner, etc.), and total energy intake and energy consumed during breakfast were computed. Based on the percentage of the daily total energy intake consumed at breakfast, participants were classified into 3 groups, high-energy breakfast consumers (>20% of total energy intake in the morning), low-energy breakfast consumers (5–20% of total energy intake), and skipping breakfast consumers (<5% of total energy intake). Authors assessed subclinical atherosclerosis using 2-dimensional ultrasound and non-contrast electrocardiography-gated prospective acquisition with a 16-slice computed tomography scanner, and defined it as the presence of plaque in the right carotid, left carotid, aorta, right iliofemoral, left iliofemoral, or coronary artery calcium. When plaques were found at ≥ 4 sites of total 6 sites, it was defined as generalized atherosclerosis.

Uzhova *et al.*, for the first time, reported that a lower percentage of total energy intake consumed at breakfast was associated with a higher risk of subclinical atherosclerosis,

more specifically, compared with high-energy breakfast, regular skipping breakfast was independently associated with a 1.55- and 2.57-fold higher odds of noncoronary and generalized atherosclerosis, respectively, even after adjusting for conventional CVD risk factors and diet quality. They also showed significant associations of skipping breakfast with obesity, abdominal obesity, metabolic syndrome, low high-density lipoprotein cholesterol, and hypertension. These results are interesting because they suggest that skipping breakfast could be one of the CVD risk factors clustering around the early onset of atherosclerosis diseases. They highlighted the importance of observing an energetic breakfast is a simple but important message to be used by health professionals to prevent atherosclerosis diseases at its earliest stages.

An issue of explaining the association between breakfast intake and CVD is causality. Skipping breakfast may increase CVD risk through CVD risk factors associated with skipping breakfast such as obesity and glucose intolerance. Although Uzhova *et al.* and other investigators have reported the positive association of skipping breakfast with CVD risk factors, subclinical atherosclerosis and CVD (5,8,9), those reports were all from observational studies, and thus, they could not confirm causality. Several randomized, controlled trials so far have investigated the impact of breakfast intake on body weight, glucose metabolism and lipid profiles for causal inference (12-16). Effects of breakfast intake shown by those trials were partially favorable, but still controversial. There is still limited evidence on the impact of breakfast intake on cardiometabolic risk profile because those existing clinical trials employed very short study duration (single-day to 16 weeks), and thus, longer-term studies will be needed (17).

In summary, Uzhova and colleagues highlight the importance of observing an energetic breakfast intake for prevention of atherosclerosis diseases at its earliest stages by showing the association between skipping breakfast and subclinical atherosclerosis.

Acknowledgements

None.

Footnotes

Conflicts of Interest: The authors have no conflicts of interest to declare.

References

1. O'Neil CE, Byrd-Bredbenner C, Hayes D, et al. The role of breakfast in health: definition and criteria for a quality breakfast. *J Acad Nutr Diet* 2014;114:S8-S26.
2. Ruxton CH, Kirk TR. Breakfast: a review of associations with measures of dietary intake, physiology and biochemistry. *Br J Nutr* 1997;78:199-213.
3. Min C, Noh H, Kang YS, et al. Skipping breakfast is associated with diet quality and metabolic syndrome risk factors of adults. *Nutr Res Pract* 2011;5:455-63.
4. Horikawa C, Kodama S, Yachi Y, et al. Skipping breakfast and prevalence of overweight and obesity in Asian and Pacific regions: a meta-analysis. *Prev Med* 2011;53:260-7.
5. Odegaard AO, Jacobs DR Jr, Steffen LM, et al. Breakfast frequency and development of metabolic risk. *Diabetes Care* 2013;36:3100-6.
6. Taniguchi-Fukatsu A, Yamanaka-Okumura H, Naniwa-Kuroki Y, et al. Natto and viscous vegetables in a Japanese-style breakfast improved insulin sensitivity, lipid metabolism and oxidative stress in overweight subjects with impaired glucose tolerance. *Br J Nutr* 2012;107:1184-91.
7. Mekary RA, Giovannucci E, Cahill L, et al. Eating patterns and type 2 diabetes risk in older women: breakfast consumption and eating frequency. *Am J Clin Nutr* 2013;98:436-43.
8. Cahill LE, Chiuev SE, Mekary RA, et al. Prospective study of breakfast eating and incident coronary heart disease in a cohort of male US health professionals. *Circulation* 2013;128:337-43.
9. Kubota Y, Iso H, Sawada N, et al. Association of Breakfast Intake With Incident Stroke and Coronary Heart Disease: The Japan Public Health Center-Based Study. *Stroke* 2016;47:477-81.
10. Kant AK, Graubard BI. 40-year trends in meal and snack eating behaviors of American adults. *J Acad Nutr Diet* 2015;115:50-63.
11. Uzhova I, Fuster V, Fernández-Ortiz A, et al. The Importance of Breakfast in Atherosclerosis Disease: Insights From the PESA Study. *J Am Coll Cardiol* 2017;70:1833-42.
12. Schlundt DG, Hill JO, Sbrocchio T, et al. The role of breakfast in the treatment of obesity: a randomized clinical trial. *Am J Clin Nutr* 1992;55:645-51.
13. Dhurandhar EJ, Dawson J, Alcorn A, et al. The effectiveness of breakfast recommendations on weight loss: a randomized controlled trial. *Am J Clin Nutr*

- 2014;100:507-13.
14. Farshchi HR, Taylor MA, Macdonald IA. Deleterious effects of omitting breakfast on insulin sensitivity and fasting lipid profiles in healthy lean women. *Am J Clin Nutr* 2005;81:388-96.
 15. Chowdhury EA, Richardson JD, Holman GD, et al. The causal role of breakfast in energy balance and health: a randomized controlled trial in obese adults. *Am J Clin Nutr* 2016;103:747-56.
 16. Betts JA, Richardson JD, Chowdhury EA, et al. The causal role of breakfast in energy balance and health: a randomized controlled trial in lean adults. *Am J Clin Nutr* 2014;100:539-47.
 17. St-Onge MP, Ard J, Baskin ML, et al. Meal Timing and Frequency: Implications for Cardiovascular Disease Prevention: A Scientific Statement From the American Heart Association. *Circulation* 2017;135:e96-121.

doi: 10.21037/arh.2018.02.01

Cite this article as: Kubota Y, Iso H. The importance of observing breakfast intake for prevention of atherosclerosis diseases at its earliest stages. *Ann Res Hosp* 2018;2:3.