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Short Communication

Epidemiology of Dyslipidemias in Asia Pacific Countries: Differences between General Population and the Elderly

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SUMMARY

A comprehensive investigation to report and compare the epidemiology of dyslipidemia in the elderly across Asia Pacific countries is still lacking. Here we compared the differences in the prevalence of dyslipidemia in the elderly among Australia, China, Japan, Korea, Malaysia, New Zealand, Philippines, Singapore, Thailand, and Taiwan based on publicly available data from websites. Generally, the prevalence of high total cholesterol (TC) and high low-density lipoprotein cholesterol (LDL-C), compared to general population, is higher in the elderly in all countries, except Japan. Gender-differences in the prevalence of high TC and high LDL-C existed in the elderly, being females higher than males in China, Japan, Korea, and Taiwan. However, low high-density lipoprotein cholesterol (HDL-C) in the elderly is more prevalent in males than in females in China, Japan, and Taiwan. There is also a big variation among the Chinese people across different countries. The prevalence of high TC (≥ 240 mg/dL) in the elderly is much higher in Malaysia than that of China, Singapore, and Taiwan. Additionally, the prevalence of high LDL-C (≥ 160 mg/dL) in the elderly is much higher in China than that of Singapore and Taiwan. Because dyslipidemia and ageing are major risk factors of cardiovascular disease and become more prevalent than before in Asia Pacific countries, each country has to establish a practical strategy to prevent and treat age-related dyslipidemia.

Atherosclerotic cardiovascular disease (ASCVD) is the leading cause of death and continues to be a major public health issue in the world.[1,2] Dyslipidemia and ageing represent major risk factors of ASCVD. Additionally, the prevalence of dyslipidemia is increasing in the elderly.[3] The mechanisms responsible for the age-related dyslipidemia have not been well understood. Apart from population of westernized diet rich in fat and cholesterol, the potential mechanisms might be impaired hepatic uptake of lipoprotein, decreased activity of lipoprotein lipase, deficiency in growth hormone, and insulin resistance induced by increasing visceral adiposity and free fatty acid owing to ageing process.[4] Recently we reviewed the epidemiology of dyslipidemia in Asia Pacific countries based on publicly available data from websites.[5] Here we aimed to further compare the differences in the prevalence of dyslipidemia between general population and the elderly in 10 Asia Pacific countries, including Australia, China, Japan, Korea, Malaysia, New Zealand, Philippines, Singapore, Thailand, and Taiwan.

The sources of lipid data, including total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), high-density lipoprotein cholesterol (HDL-C), and triglycerides (TG), among general population and the elderly for each country were shown in Table 1. Additionally, the year of survey and the definition of age ranges in general population and the elderly for each country were also listed in Table 1. The cut-off values of serum lipid components to define dyslipidemia were not identical between countries (Table 2). Generally, the prevalence of high TC and high LDL-C, compared to general population, was higher in the elderly in all countries, except Japan (Table 2). In the elderly, gender-differences in the prevalence of high TC and high LDL-C existed, being females higher than males in China, Japan, Korea, and Taiwan (Table 2). By contrast, the prevalence of low HDL-C in the elderly was higher in males than that of females in China, Japan, and Taiwan (Table 2). Among the Chinese people across different countries, the prevalence of high TC (≥ 240 mg/dL) in the elderly was much higher in Malaysia than that of China, Singapore, and Taiwan. Additionally, the prevalence of high LDL-C (≥ 160 mg/dL) in the elderly was much higher in China than that of Singapore and Taiwan (Fig. 1).

In conclusion, the prevalence of dyslipidemia across the Asia Pacific countries varied substantially. The variation might be attributed to differences in ethnicities, urbanization, diet habits, and prescription rate of lipid-lowering drugs. Because ASCVD and ageing are emerging as major health issues in Asia Pacific countries,[2,6] it is necessary for each country to conduct the epidemiological survey and implement treatment programs for age-related dyslipidemia.

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Table 1
Data source of 10 Asia Pacific countries from publicly accessible websites.

Country *	Data source	Year of survey	Age range (years)
Australia	http://www.racgp.org.au/download/Documents/Guidelines/Redbook9/17048-Red-Book-9th-Edition.pdf	2014–2015	General population: ≥15 Elderly: ≥75
China	*J Atheroscler Thromb.* 2012;19:159–168.	2008	General population: ≥18 Elderly: 60–79
Japan	http://www.mhlw.go.jp/bunya/kenkou/eiyou/dl/h28-houkoku-05.pdf http://www.mhlw.go.jp/bunya/kenkou/eiyou/dl/h27-houkoku-05.pdf	2015, 2016	General population: ≥20 Elderly: ≥65
Korea	*Diabetes Metab J.* 2013;37:433–449. *Endocrinol Metab.* 2017;32:30–35.	2010	General population: ≥20 Elderly: ≥60
Malaysia	*J Atheroscler Thromb.* 2012;19:159–168.	2006–2012	General population: ≥35 Elderly: ≥65
New Zealand	https://www.health.govt.nz/system/files/documents/publications/nz-primary-care-handbook-2012.pdf	2015–2016	General population: ≥15 Elderly: ≥65
Philippines	http://endo-society.org.ph/v5/wp-content/uploads/2013/06/Dyslipidemia-Clinical-Guidelines-final_01mar.pdf	2013	General population: ≥20 Elderly: ≥60
Singapore	https://www.moh.gov.sg/content/dam/moh_web/HPP/Doctors/cpg_medical/current/2016/lipids/MOH%20Lipids%20CPG%20-%20Executive%20Summary.pdf	2010	General population: ≥18 Elderly: ≥60
Thailand	J Lipids. 2014;2014:249584.	2009	General population: ≥20 Elderly: =60
Taiwan	http://www.hpa.gov.tw/BHPNet/Web/healthtopic/TopicArticle.aspx?No=201102110002&parentid=200712250015	2007	General population: ≥20 Elderly: ≥60

* Arrange in alphabetical order.

Table 2
The prevalence of dyslipidemia in general population and in the elderly across 10 Asia Pacific countries.

Lipid component	Cut-off value to define "abnormal" levels	Country	Prevalence	
			General population	Elderly
TC	≥240 mg/dL	China	12.2% (Males 12.1%, Females 12.3%)	23.9% (Males 12.9%, Females 28.0%)
		Japan	14.5% (Males 10.3%, Females 17.4%)	13.1% (Males 7.7%, Females 17.2%)
		Korea	14.5% (Males 13.8%, Females 15.1%)	27.8% (60–69 years of age) (Males 17.9%, Females 37.0%) 22.7% (≥70 years of age) (Males 12.5%, Females 29.5%)
		Malaysia	44.9% (Males 46.7%, Females 43.5%)	59.7% (Males 56.5%, Females 64.4%)
		Philippines	46.9%	58.8% (60–69 years of age) 54.6% (≥70 years of age)
		Singapore	17.4%	23.3%
		Thailand	20.4%	Not available *
		Taiwan	11.2% (Males 11.3%, Females 11.1%)	16.7% (Males 12.0%, Females 20.8%)
	≥210 mg/dL	Australia	7.1%	25.2%
	Medicated	New Zealand	11.5%	33.0%
LDL-C	≥160 mg/dL	China	17.9% (Males 18.6%, Females 17.5%)	33.2% (Males 25.1%, Females 37.3%)
		Japan	9.0% (Males 7.4%, Females 10.1%)	7.6% (Males 4.9%, Females 9.6%)
		Korea	14.8% (Males 14.3%, Females 15.2%)	26.9% (60–69 years of age) (Males 17.7%, Females 35.3%) 23.4% (≥70 years of age) (Males 12.4%, Females 30.5%)
		Philippines	47.2%	59.8% (60–69 years of age) 57.5% (≥70 years of age)
		Singapore	15.2%	20.3%
		Taiwan	7.8% (Males 8.6%, Females 7.2%)	8.5% (Males 8.0%, Females 8.9%)
	According to ATP III. High LDL-C are defined as follows: LDL-C ≥100 mg/dL if having prior CHD or CHD equivalent or having 10-year CHD risk >20%; LDL-C ≥ 130 mg/dL if having ≥2 risk factors (RF) and/or 10-year CHD risk 10% to 20%; and LDL-C ≥160 mg/dL if having 0-1 RF.	Thailand	29.6%	Not available *
HDL-C	<40 mg/dL	China	12.0% (Males 19.5%, Females 6.7%)	12.5% (Males 15.3%, Females 8.0%)
		Japan	6.2% (Males 11.3%, Females 2.6%)	7.4% (Males 12.5%, Females 3.4%)
		Korea	41.2% (Males 34.1%, Females 48.2%)	51.4% (60–69 years of age) (Males 41.8%, Females 60.2%) 57.3% (≥70 years of age) (Males 39.5%, Females 69.1%)
		Singapore	8.1%	6.8%
		Taiwan	10.1% (Males 15.7%, Females 5.3%)	12.5% (Males 18.3%, Females 7.4%)
	<40 mg/dL for males; <50 mg/dL for females	Philippines	71.3%	74.4% (60–69 years of age) 76.5% (≥70 years of age)
		Thailand	47.1%	~50%
TG	≥200 mg/dL	China	15.1% (Males 20.6%, Females 11.3%)	16.0% (Males 12.2%, Females 19.2%)
		Japan	19.4% (Males 26.3%, Females 14.7%)	21.8% (Males 25.9%, Females 18.4%)
		Korea	28.7% (Males 38.0%, Females 19.5%)	34.0% (60–69 years of age) (Males 38.9%, Females 29.5%) 37.1% (≥70 years of age) (Males 32.4%, Females 40.2%)
		Taiwan	15.3% (Males 19.5%, Females 11.6%)	19.0% (Males 16.6%, Females 21.2%)
	≥150 mg/dL	Philippines	38.6%	42.8% (60–69 years of age) 34.4% (≥70 years of age)
		Thailand	38.6%	~45%

ATP III, The Third Adult Treatment Panel; CHD, coronary heart disease; HDL-C, high-density lipoprotein cholesterol; LDL-C, low-density lipoprotein cholesterol; TC, total cholesterol; TG, triglyceride.
* All lipid levels, except HDL-C, were higher in females of older age (≥60 years).

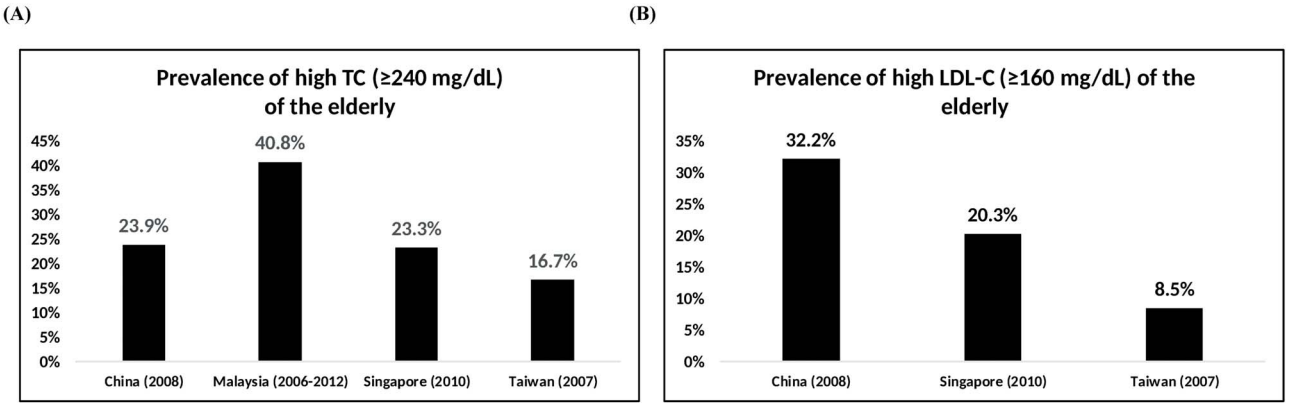

Fig. 1. (A) The prevalence of high TC (≥ 240 mg/dL), and (B) The prevalence of high LDL-C (≥ 160 mg/dL) in Chinese people across different countries. Note that the data were from people ≥ 65 years in Malaysia, while ≥ 60 years in the other countries.

Conflicts of interest

The authors have no conflicts of interest to declare.

References

1. Lozano R, Naghavi M, Foreman K, et al. Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet.* 2012;380:2095–2128.
2. Yusuf S, Reddy S, Ounpuu S, Anand S. Global burden of cardiovascular diseases: Part II - Variations in cardiovascular disease by specific ethnic groups and geographic regions and prevention strategies. *Circulation.* 2001;104:2855–2864.
3. Shanmugasundaram M, Rough SJ, Alpert JS. Dyslipidemia in the elderly: Should it be treated? *Clin Cardiol.* 2010;33:4–9.
4. Liu HH, Li JJ. Aging and dyslipidemia: A review of potential mechanisms. *Ageing Res Rev.* 2015;19:43–52.
5. Lin CF, Chang YH, Chien SC, et al. Epidemiology of dyslipidemia in the Asia Pacific region. *Int J Gerontol.* 2018;12:2–6.
6. Pohlel K, Grow P, Helmy T, et al. Treating dyslipidemia in the elderly. *Curr Opin Lipidol*. 2006;17:54–57.