Association between adult short stature and cerebral microbleeds

Hirotomo Yamanashi, MD1,2, Yuji Shimizu, MD, PhD3, Kenji Nagaoki, MD, PhD4, Kunihiko Murase, MD, PhD4, Jun Koyamatsu, MD1, Masaharu Nobuyoshi, MD, PhD1, Mako Nagayoshi, PhD3, Koichiro Kadota, MD, PhD3, Mami Tamai, MD, PhD5, Yohei Tateishi, MD, PhD6, Akira Tsujino, MD, PhD6, Takahiro Maeda, MD, PhD1,3

(1) Department of Island and Community Medicine, Nagasaki University Graduate School of Biomedical Science, Goto, Nagasaki, Japan; (2) Department of Clinical Medicine, Institute of Tropical Medicine, Nagasaki University, Sakamoto, Nagasaki, Japan; (3) Department of Community Medicine, Nagasaki University Graduate School of Biomedical Science, Sakamoto, Nagasaki, Japan; (4) Nagasaki Goto Central Hospital, Yoshikugi, Goto, Nagasaki, Japan; (5) Department of Reumatology, Nagasaki University Hospital, Sakamoto, Nagasaki, Japan; and (6) Department of Neurology and Strokology, Nagasaki University Hospital, Sakamoto, Nagasaki, Japan

Correspondence:

Hirotomo Yamanashi

Department of Island and Community Medicine, Nagasaki University Graduate School of Biomedical Science, Goto, Nagasaki, Japan, 853-8691

E-mail: yamanashi@nagasaki-u.ac.jp

Table 1. Clinical characteristics of the study population, based on height tertiles.

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Dear editor,

Cerebral microbleeds (CMBs) are frequently detected on T2*-weighted magnetic resonance imaging in patients with stroke and are also predictive of future stroke (1,2). We hypothesized that a short stature is a risk factor for CMBs because height and the risk of stroke are inversely associated according to previous studies (3,4).

To determine the association between height and CMBs, we carried out a cross-sectional study on Japanese adult subjects in a general hospital in Goto island. All brain MR images using T2*-weighted gradient-recalled echo sequence between 26th November, 2012 and 30th June, 2014 were collected. We excluded subjects with osteoporosis medication use, and maintenance hemodialysis. CMBs were defined as being ≤10 mm in diameter, and the location of CMBs was recorded and categorized into 3 groups: lobar-only distribution, deep-only distribution, and any CMBs according to a previous report (3). Subjects were divided into tertiles according to height and the shortest height tertile was treated as a reference group.

A total of 219 of 911 subjects had any CMBs, 76 had lobar-only distribution, and 71 had

deep-only distribution. In logistic regression analysis, the tallest stature compared with the shortest stature was significantly associated with any CMBs (OR 0.36, 95% CI 0.24-0.53), and lobar-only CMBs (0.22, 0.11-0.44), but not deep-only CMBs (0.55, 0.30-1.00). These associations of any and lobar-only CMBs remained significant after further adjustments: age, sex, past history of stroke, antiplatelet/anticoagulant medication use, hypertension, diabetes mellitus, dyslipidemia, and atrial fibrillation (0.63, 0.40-1.00 and 0.33, 0.15-0.70, respectively). The results of those analyses were consistent after we excluded subjects with acute cerebrovascular events or dementia.

This study showed a significant inverse association between height and the risk of CMBs in the Japanese population. This association is particularly evident among CMBs with a strictly lobar distribution.

Conflicts of interest: None.

References:

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Tables

Table 1. Clinical characteristics of the study population, based on height tertiles.

	Height tertile*			
	Shortest (n=295)	Medium (n=318)	Tallest (n=298)	*Age-adjusted P* for the trend
Age, years	74.3 ± 10.6	66.4 ± 13.7	57.8 ± 15.7	**<0.001**
Male	154 (52.2)	159 (50.1)	155 (52)	0.828
Mean height, cm	151.3 ± 6.6	158.4 ± 6.1	166.1 ± 7.3	**<0.001**
Body weight, kg	53.8 ± 9.8	59.4 ± 10.9	64.1 ± 12.4	**<0.001**
Body mass index, kg/m^2	23.5 ± 3.7	23.6 ± 3.7	23.2 ± 3.9	0.145
Past history of stroke	47 (16.0)	49 (15.4)	38 (12.8)	0.618
Antiplatelet and/or anticoagulant medication use	84 (28.5)	91 (28.6)	50 (16.8)	0.131
NOACs†	1 (0.3)	6 (1.9)	3 (1.0)	0.107
Warfarin	17 (5.8)	17 (5.3)	11 (3.7)	0.629
Antiplatelet medication use	71 (24.1)	72 (22.6)	38 (12.8)	0.303
Dementia (any type of diagnosis)	43 (14.9)	22 (6.9)	19 (6.4)	0.125
Dementia medication use	17 (5.8)	14 (4.4)	6 (2.0)	0.920
Hypertension	189 (64.1)	187 (58.8)	134 (45.0)	0.153
Diabetes mellitus	57 (19.3)	66 (20.8)	32 (10.7)	0.071
Dyslipidemia	90 (30.5)	94 (29.6)	51 (17.1)	0.096
Atrial fibrillation	22 (7.5)	28 (8.8)	20 (6.7)	0.055
Serum creatinine‡ , mg/dl	0.82 ± 0.29	0.82 ± 0.38	0.80 ± 0.58	0.453
Acute cerebrovascular events	39 (13.2)	28 (8.8)	28 (9.4)	0.116
Ischemic stroke	38 (12.9)	27 (8.5)	26 (8.7)	0.177
Intracerebral hemorrhage	0.0	2 (0.6)	2 (0.7)	0.177
Subarachnoid hemorrhage	1 (0.3)	0.0	0.0	0.477
Current smoker	40 (13.6)	40 (12.6)	63 (21.1)	0.164
Habitual drinker	54 (18.3)	88 (27.7)	93 (31.2)	0.080

Data are mean ± standard deviation or n (%).

*Height tertiles are <161 cm, 161-167.5 cm, >167.5 cm for men, and <150 cm, 150-155 cm, >155 cm for women.

†NOACs (non-vitamin K antagonist oral anticoagulants): Including dabigatran, rivaroxaban, apixaban and edoxaban. Dementia: Defined as clinical diagnosed by a psychiatrist and/or dementia medication use. Dementia medication: Including donepezil, memantine, rivastigmine and galantamine. Hypertension: Defined as history of hypertension or antihypertensive medication use. Diabetes mellitus: Defined as history of diabetes mellitus or hypoglycemic medication use. Dyslipidemia: Defined as history of dyslipidemia or lipid lowering medication use.

‡N=785.