Total Cholesterol, High Density Lipoprotein Cholesterol and Choline Esterase in Overseas and Japanese University Students

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NAKAMURA, S. *Total Cholesterol, High Density Lipoprotein Cholesterol and Choline Esterase in Overseas and Japanese University Students.* Tohoku J. exp. Med., 1985, **145** (4), 369-371 — Serum lipids were studied in 97 overseas and 282 Japanese university students. As compared with Japanese, serum total cholesterol levels were low and high density lipoprotein/total cholesterol ratio was high in the overseas students, especially in Chinese and Korean students. 30-39-year-old Chinese students, moreover, showed elevated high density lipoprotein levels. Choline esterase levels were significantly lower in 30-39-year-old Chinese and Korean students than in Japanese and Taiwanese. ——— total cholesterol; high density lipoprotein cholesterol; choline esterase; overseas university students; Japanese

Average dietary fat intake has been doubled in Japan in these 20 years, and serum total cholesterol (TC) levels, especially of youth, seem to have approached to the levels of Europeans and Americans (Sekimoto et al. 1983). As there are few reports of determination of serum lipids in Japanese and foreign youth at the same laboratories, we compared serum TC and high density lipoprotein cholesterol (HDL-C) between overseas and Japanese university students. Choline esterase (ChE) was also compared as an index of nutritional state.

SUBJECTS AND METHODS

Subjects studied consisted of 97 overseas and 282 Japanese students at Tohoku University, and were divided into 20-29-year-old and 30-39-year-old age groups. As most Japanese students were less than 30 years, staffs of the university were also included in the 30-39-year-old Japanese group. As for relative body weight, both age groups of Chinese males showed significantly lower values (0.92 and 0.95) than Japanese males (0.98 and 1.04) ($p < 0.02$ and $p < 0.05$).

Cholesterol was measured by the enzyme method, and HDL-C after precipitation of low and very low density lipoproteins by magnesium chloride and phosphotungstate. ChE was determined by the method of Ashihara et al. (1983).

TABLE 1. *Total cholesterol, HDL cholesterol, HDL cholesterol/total*

Group	Number		Total cholesterol (mg/100 ml)	
	20-29 years	30-39 years	20-29 years	30-39 years
Chinese males	19	7	167***	189
Taiwanese m.	2	4	(226)	175
Korean m.	7	22	164*	168****
Other Asian m.	10	9	178	198
Euro-American m.	5	3	171	197
Total overseas m.	43	45	172***	180***
Japanese m.	192	38	188	202
Overseas females	8	1	183	(184)
Japanese f.	44	8	197	200

* $p < 0.05$, ** $p < 0.02$, *** $p < 0.01$, **** $p < 0.001$ for differences from Japanese students
 # $p < 0.02$, ## $p < 0.001$ for differences from Taiwanese males.

RESULTS AND DISCUSSION

The results are shown in Table 1. There were significant sex differences in HDLC in both age groups of Japanese and in the younger overseas group ($p < 0.001$), and also in HDLC/TC ratio ($p < 0.01$, $p < 0.05$, and $p < 0.001$). There were also significant differences in TC ($p < 0.05$), HDLC ($p < 0.01$), and HDLC/TC ratio ($p < 0.01$) between the two age groups of Japanese males.

TC levels in both age groups of the overseas males were significantly lower than Japanese. Among the overseas groups, 20-29-year-old Chinese males and both age groups of Korean males showed significantly lower TC than Japanese.

Though no significant difference was found in HDLC between the total overseas students and Japanese, HDLC levels in 30-39-year-old Chinese males were significantly higher than those in Japanese and other Asian groups.

Significantly higher HDLC/TC ratio than Japanese was observed in both age groups of the overseas males, 20-29-year-old overseas females, both age groups of Chinese males, and 30-39-year-old Korean males. The ratio in 30-39-year-old Chinese males was also significantly higher than that in other Asian males.

As for ChE, both 30-39-year-old Chinese and Korean males showed significantly lower levels than Japanese and Taiwanese. The correlation coefficient between HDLC/TC ratio and ChE calculated in 6 groups of 20-39-year-old overseas and Japanese males was -0.86 , ($p < 0.05$).

Thus, as compared with Japanese, TC was low and HDLC/TC was high in the overseas students, especially in Chinese and Korean students. Older Chinese

cholesterol ratio, and choline esterase in overseas and Japanese students

HDL cholesterol (mg/100 ml)		HDLC/TC (%)		Choline esterase (U/liter)	
20-29 years	30-39 years	20-29 years	30-39 years	20-29 years	30-39 years
57.9	59.5**††	35.4***	32.6*†	346	293***##
(41.8)	50.7	(18.9)	28.9	(479)	412
49.4	51.3	30.9	31.0***	368	315***#
52.8	41.5	29.9	22.1369	401	
60.0	49.5	35.2	25.3	346	342
54.9	50.4	32.6**	28.9*	361	339
54.2	47.8	29.5	24.8	356	371
75.2	(56.5)	41.7****	(30.7)	306	(249)
65.6	63.8	33.0	31.7	320	328

dents. † $p < 0.05$, †† $p < 0.001$ for differences from other Asian males.

students, moreover, showed significantly higher HDLC levels. In these respects, the present Japanese students differ from Chinese and Korean students and are rather similar to European, American, and other Asian students. This may be ascribed to the nutritional state since ChE was significantly lower in Chinese and Korean students and a significant correlation was observed between HDLC/TC ratio and ChE.

References

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