elderly people (79.7% of eligible subjects). Sanobe town has a population of 16 700 with 3340 of 65 years or more and we were able to examine 411 elderly (12.3% of eligible subjects). The geriatric survey for community-dwelling elderly living in Japan and in Laos was carried out in April 2003 and February 2004 respectively.

Items of comprehensive geriatric assessment

Items of comprehensive geriatric assessment included ADL, assessment of depression and quantitative assessment of QOL, as well as medical and anthropometrical indicators.

Activities of daily living

For basic-ADL assessment, each subject rated his/her independence in regard to seven items (walking, ascending and descending stairs, feeding, dressing, making his/her toilet, bathing, grooming) as to the help needed. The items were rated from 3 to 0 : 3, completely independent; 2, need some help; 1, need much help; 0, completely dependent). The items were added to give scores ranging from 0 to 21, with low scores indicating disability.[2,11–16] Information-related function was defined as scores summed from four items (visual acuity, hearing acuity, conversation and memory in one day) using a rating scale from 0 (cannot at all) to 3 (completely independent) producing total scores in the range of 0–12. For higher-level functional capacity, each subject rated his/her independence in the Tokyo Metropolitan Institute of Gerontology (TMIG) index of competence.[24,25] This assessment consists of a 13-item index including three sublevels of competence: (i) instrumental ADLs (five items: the ability to use public transport, buy daily necessities, prepare a meal, pay bills and handle banking matters, rated on a yes/no basis); (ii) intellectual ADLs (four items: the ability to complete forms, read newspapers, read books or magazines and take interest in television programs or news articles on health-related matters, rated on a yes/no basis); and (iii) social ADLs (four items: the ability to visit friends, give advice to relatives and friends who confide, visit someone at the hospital and initiate conversation with younger people, rated on a yes/no basis).

Depression and QOLs

We screened for depressive symptoms using the Japanese version of the 15 item-Geriatric Depression Scale (GDS-15), which was also translated into Lao.[26,27] We defined depression as a GDS-15 score of 6 or more, with a score of 6–9 indicating 'mild depression', and a score of 10 or more indicating 'severe depression'. QOLs were assessed using a 100 mm visual analog scale (worst QOL on the left end of the scale, best on the right) in the following five items; subjective sense of health, relationship with family, relationship with friends, financial status and subjective happiness.[28,29]

Social, anthropometrical and medical assessments

Living conditions, lifestyle (current exercise levels, alcohol consumption, smoking and so on) and medical histories (histories of stroke, heart disease and osteoarthropathies, as well as taking antihypertensive drugs) were also assessed. Two blood pressure measurements taken in a sitting position by autosphygmomanometer (HEM 757, Omron, Japan) were averaged to produce the blood pressure level of the subjects. Physical examination and blood chemical analysis (total cholesterol, HDL-cholesterol, creatinine, blood sugar, hemoglobin, uric acid, GOT and GPT) were performed.

Statistical analysis

Statistical analysis was performed using StatView ver.5 for Macintosh (SAS institute, Inc., Cary, NC). The Student's *t*-test was used for continuous variables and χ^2 test was used for categorical variables. *P*-values less than 0.05 were used to indicate statistical significance.

Results

Table 1 shows the comparison of baseline characteristics between the elderly subjects living in Songkhon in Laos and those in Kyoto in Japan. The elderly subjects in Songkhon were significantly younger (69.6 years old) than those in Kyoto (71.7 years old). There was no difference in the male–female ration between two areas. The percentage of widowed individuals was higher in Songkhon (33.6%) than in Kyoto (18.8%). Most of the elderly in Songkhon (88.8%) were living with children or parents, while the percentage of elderly living with a spouse only or living alone was lower in Songkhon (5.9%, 0.4%) than in Kyoto (38.2%, 7.6%). Consumption of alcohol 'every day' and smoking 'currently' were lower in Songkhon (1.7%, 4.1%) than in Kyoto (22.0%, 13.8%), while the percentages of elderly drinking alcohol 'sometimes' and 'past' smokers were higher in Songkhon (41.4%, 29.7%) than in Kyoto (26.7%, 14.1%). The rate of elderly subjects taking any medication 'every day' was lower in Songkhon (24.3%) than in Kyoto (47.2%), while the rate of elderly subjects taking any medication 'sometimes' was higher in Songkhon (52.1%) than in Kyoto (9.8%). The rate of elderly subjects taking antihypertensive medication was much lower in Songkhon (4.5%) than in Kyoto (34.0%), but there were more people who did not know if they had been taking antihypertensive medication or not in Songkhon (44.3%) than in Kyoto (1.0%). Actually most

Table 1 Baseline characteristics between the community-dwelling elderly living in Laos and those living in Japan

	Songkhon in Laos ($n = 294$)	Kyoto in Japan ($n = 411$)	*P*
Mean age	69.6 ± 7.6	71.7 ± 4.8	< 0.0001
Male/female	121/173	174/237	NS
Marital state (%)			< 0.0001
Widowed	33.6	18.8	
Unmarried	2.1	0.2	
Divorced	2.8	0.7	
Lifestyle			
Residential situation (%)			< 0.0001
With children or parents	88.8	53.4	
With spouse only	5.9	38.2	
Alone	0.4	7.6	
Others	4.9	0.7	
Drinking alcohol (%)			< 0.0001
Every day	1.7	22	
Sometimes	41.4	26.7	
None	56.9	51.4	
Smoking (%)			< 0.0001
Current	4.1	13.8	
Past	29.7	14.1	
Never	66.2	72	
Medical			
Taking any medication (%)			< 0.0001
Everyday	24.3	47.2	
Occasionally	52.1	9.8	
No	23.6	43	
Taking anti-hypertensive medication (%)			< 0.0001
Yes	4.5	34	
No	51.2	65	
Do not know	44.3	1	
Recognition of blood pressure			< 0.0001
Normal	10.3	60.6	
High	7.2	37	
Do not know	82.5	2.4	
History of stroke (%)			< 0.0001
Yes	27.1	4.0	
No	71.6	96.0	
Do not know	1.4	0.0	
History of heart disease (%)			< 0.0001
Yes	15.5	21.2	
No	43.6	78.8	
Do not know	40.9	0.0	
History of osteoarthropathy (%)			NS
Yes	58.2	59.4	
No	41.1	40.6	
Do not know	0.7	0.0	
History of fall (%)	31.5	12.8	< 0.0001

NS, not significant.

Table 2 Comparison of activities of daily living (ADL) and quality of life (QOL) scores between the community-dwelling elderly living in Laos and those living in Japan

	Songkhon in Lao PDR ($n = 294$)	Kyoto in Japan ($n = 411$)	P
ADLs			
Scores of basic ADL (0–21)	20.2 ± 2.0	20.8 ± 0.7	< 0.0001
% of Independence of basic ADL	70.2	89.2	< 0.0001
Information-related function (0–12)	9.4 ± 1.6	11.7 ± 0.8	< 0.0001
% of Independence of information-related function	12	81.1	< 0.0001
Scores of Instrumental ADL (0–5)	3.2 ± 1.5	4.9 ± 0.5	< 0.0001
% of Independence of instrumental ADL	18.8	92.6	< 0.0001
Scores of Intellectual ADL (0–4)	1.3 ± 1.3	3.7 ± 0.6	< 0.0001
% of Independence of intellectual ADL	10.6	80.2	< 0.0001
Scores of Social Role (0–4)	3.2 ± 1.1	3.5 ± 1.0	0.0005
% of Independence of Social ADL	54.1	69.2	< 0.0001
Scores of TMIG (0–13)	7.7 ± 3.2	12.1 ± 1.6	< 0.0001
% of independence of TMIG	5.8	93	< 0.0001
Depression			
Scores of GDS (0–15)	5.6 ± 2.8	3.4 ± 3.2	< 0.0001
% of GDS ≥ 6	48.3	22.7	< 0.0001
% of GDS ≥ 10	6.5	5.1	NS
QOLs (0–100)			
Subjective health	55.4 ± 16.9	67.2 ± 17.8	< 0.0001
Family relationship	71.7 ± 16.9	81.5 ± 16.9	< 0.0001
Friend relationship	74.3 ± 17.4	79.8 ± 16.7	< 0.0001
Financial satisfaction	50.0 ± 11.7	64.0 ± 21.5	< 0.0001
Subjective happiness	66.2 ± 17.3	73.2 ± 17.6	< 0.0001

GDS, Geriatric Depression Scale; NS, not significant; TMIG, Tokyo Metropolitan Institute of Gerontology index of competence.

people (82.5%) in Songkhon did not know how their blood pressure had been. The rate of subjects recognizing their apparent history of stroke was higher in Songkhon (27.1%) than in Kyoto (4.0%). The rate of subjects recognizing their apparent history of heart disease was 15.5% in Songkhon and 21.2% in Kyoto, but many elderly in Songkhon (40.9%) did not know if they had suffered heart disease or not. The rates of osteoarthropathy were common in elderly subjects in both Songkhon and Kyoto (58.2%, 59.4%). A history of falls in the last year was more frequent in Songkhon (31.5%) than in Sonobe (12.8%).

Table 2 shows the comparison of averaged scores on ADLs, GDS-15 score and quantitative QOLs between community-dwelling elderly living in Songkhon and those living in Kyoto. In ADLs, all scores of basic, instrumental, intellectual and social ADL were lower in Songkhon than in Kyoto. Information-related function in Songkhon was also lower than in Kyoto. Consequently the percentage of independence (rate of full scale) of all ADLs in Songkhon were also lower than in Kyoto. The differences in instrumental and intellectual ADL were more distinct than those of basic ADL and social ADL.

The mean score of GDS-15 and the prevalence of mild or severe depression (GDS ≥ 6) were both significantly higher in elderly subjects in Songkhon (48.3%) than in Kyoto (22.7%). The elderly of Songkhon had significantly lower scores in all QOL items of subjective sense of health, family relationships, relationships with friends, financial satisfaction and subjective happiness than the elderly in Kyoto. The differences in QOL in subjective health and financial satisfaction were distinct.

Table 3 shows the comparison of anthropometrical indicators and blood pressure measurements between the two elderly groups. Height, weight, body mass index and systolic blood pressure were significantly lower in the elderly in Songkhon than in those of Kyoto. the prevalence of hypertension defined as systolic pressure >140 mmHg or diastolic pressure >90 mmHg based on the measurements of casual blood pressure was lower in subjects in Songkhon (39.5%) than in Kyoto (48.7%).

Table 4 shows the comparison of blood chemical findings between the two elderly groups. Levels of both total- and HDL-cholesterol were much lower in Songkhon than in Kyoto. The atherogenic index in the elderly in Songkhon was higher (6.8) than in Kyoto (2.4). Averaged blood sugar in Songkhon (136.5 mg/dL)

Table 3 Comparison of anthropometrical indicators and blood pressure between the community-dwelling elderly in Laos and those in Japan

	Songkhon in Laos ($n = 294$)	Kyoto in Japan ($n = 411$)	*P*
Anthropometrical			
Height (cm)	151.4 ± 7.3	154.2 ± 8.6	< 0.0001
Weight (kg)	49.2 ± 10.1	53.9 ± 8.7	< 0.0001
Body mass index	21.4 ± 3.8	22.6 ± 2.7	< 0.0001
Blood pressure			
Systolic blood pressure (mmHg)	136 ± 22	141 ± 20	0.004
Diastolic blood pressure (mmHg)	80 ± 12	78 ± 11	NS
Prevalence of hypertension (%) (SBP > 140 or DBP > 90)	39.5	48.7	0.016

DBP, diastolic blood pressure; SBP, systolic blood pressure.

Table 4 Comparison of blood chemical findings between the community-dwelling elderly in Laos and those in Japan

	Songkhon in Laos ($n = 294$)	Kyoto in Japan ($n = 411$)	*P*
Total cholesterol (mg/dL)	161.7 ± 45.4	209.5 ± 35.0	< 0.0001
HDL-cholesterol (mg/dL)	23.4 ± 8.7	65.6 ± 16.7	< 0.0001
Atherogenic Index	6.8 ± 3.4	2.4 ± 0.9	< 0.0001
Creatinine (mg/dL)	0.96 ± 0.53	0.89 ± 0.19	0.02
Blood sugar (mg/dL)	136.5 ± 74.0	99.3 ± 21.1	< 0.0001
% of Impaired glucose tolerance	28.3	4.4	< 0.0001
Hemoglobin (g/dl)	9.3 ± 1.4	13.6 ± 1.4	< 0.0001
% of anemia	98.4	12.0	< 0.0001
Uric acid (mg/dl)	6.0 ± 5.2	5.0 ± 1.3	0.0001
GOT (IU/L)	34.9 ± 25.4	25.5 ± 16.2	< 0.0001
GPT (IU/L)	32.8 ± 21.8	20.8 ± 22.3	< 0.0001

Anemia is defined as: men, Hb < 13 g/Dl; women, Hb < 12 g/dL; impaired glucose tolerance defined as blood sugar levels ≥ 140 mg/dL.

was much higher than that in Kyoto (99.3 mg/dL). Consequently the prevalence of impaired glucose tolerance (blood sugar ≥ 140 mg/dL) was much higher in Songkhon (28.3%) than in Kyoto (4.4%). Averaged hemoglobin level in Songkhon (9.3 g/dL) was much lower than in Kyoto (13.6 g/dL). The percentage of anemia, based on the World Health Organization's the criteria (men: Hb < 13 g/dL, women: Hb < 12 g/dL), was markedly higher in Songkhon (98.4%) than in Kyoto (12.0%). Creatinine, uric acid, GOT and GPT were higher in Songkhon than in Kyoto.

Discussion

Laos gained independence from French Indochina, and following the end of the Vietnam War in 1975, Laos was set up. In 1997 Laos became a full member of the Association of South-east Asian Nations (ASEAN). Laos is one of the more slowly developing countries in ASEAN with a GDP per capita of $US1900, which is 6.5% of the GDP of Japan in 2004, $US29 400. The total population of Laos is 6.2 million people and the proportion of those over 65 years of age is 3.2% in 2005. Life expectancy at birth in Laos is 53.1 years for men and 57.2 years for women in 2005. While life expectancy at birth in Japan is 77.9 years for men and 84.6 years for women in 2005.[23] As it is known in many developing countries, the causes of shorter life expectancy in Laos than in Japan are higher rates of death especially in infancy and childhood, high prevalence of infections and other factors related to hygiene level. Infant mortality rates in Laos and Japan are 85.2 and 3.3 deaths per 1000 live births respectively in 2005.[23]

The Laos population is made up of over 60 ethnic groups and traditionally divide themselves into three categories; Lao Loum (lowland; 68%), Lao Theung

(upland; 22%) and Lao Soung (highland, including the Hmong and Yao 9% and ethnic Vietnamese/Chinese 1%): roughly classified according to the altitude at which they live.[23]

There are differences in living conditions, climate and economic status between Songkhon (rural village) in Laos (dry and wet tropical monsoon climate) and Sonobe, a rural town in Kyoto, in Japan (temperate climate). Accordingly there were substantial differences in lifestyle and medical conditions. More elderly subjects in Songkhon live with children or parents and they had less alcohol and tobacco consumption than those in Kyoto. There were more elderly subjects in Songkhon taking medication than in Kyoto as they may take traditional medicine more often. As most elderly subjects in Songkhon were not aware of their blood pressure, many elderly did not know about antihypertensive medicine and few were receiving any antihypertensive medication. The prevalence of osteoarthropathy was high in both groups of subjects. There were more elderly who were of aware of their own history of stroke and of falls in Songkhon than in Kyoto and we should conduct further examination of this.

In the comparison of ADLs between Lao elderly subjects and Japanese ones, there were differences in all ADL items such as basic and instrumental ADLs, intellectual activities, social activities and information related functions. The subjects in Songkhon had slightly lower scores for basic ADLs and a lower rate of independence than in Kyoto. Compared with the degree of difference in basic ADL, that of higher functional capacity such as instrumental ADL and intellectual activities were much more obvious between the two groups. These higher functions may be more influenced by differences in economic status and education levels between the two countries than basic ADLs. The instrumental ADL is associated with the economic activities, such as using public transportation and shopping. Intellectual activities are associated with the ability to read and write. The percentage of people (15 years old or over) who can read and write was 61.8% (67.5% of men, 38.1% of women) in Laos, while that in Japan was 99.8% in 2003.[23]

A higher prevalence of depression and lower quantitative QOLs were also found in Laos than in Japan. In particular the QOL in subjective health and financial satisfaction were much lower in Laos than in Japan and this may reflect the objective differences of health and economic status.

We are going to carry out further analysis for the dependent factors on the QOLs and depression in this survey. Analysis of factors other than physical or mental ones that could be contributing to lower QOLs in Lao elderly, such as social, economic or spiritual circumstances remain to be determined due to the limitations of this study.

A limitation of this research was that we could not check all community-dwelling elderly, because some frail or housebound elderly could not come by themselves to the health center or temple where the assessments were conducted in Songkhon. But as many as 79.7% of eligible community-dwelling elderly in Songkhon were assessed, so it could be considered that almost all residents who could move were assessed. The subjects examined in Kyoto represented 12.3% of all residents, so the findings regarding this group may be biased and display some differences from those of all eligible elderly. It could be that a greater proportion of subjects with good functions and health status came to join our survey in Kyoto. To eliminate this bias, we analyzed only the subjects whose basic ADL was independent; 205 elderly subjects (67.9 years) in Songkhon and 362 subjects (71.4 years) in Kyoto. In this analysis all results (Tables 1–4) remained almost the same except for the scores of social role in ADL and relationships with friends in QOL in Table 2. Differences in those averaged scores became insignificant between the two elderly groups who were completely independent in basic ADL.

In anthropometrical functions, Lao elderly people had lower height, weight and BMI than the Japanese. Mean systolic blood pressure and the prevalence of hypertension were lower in Lao elderly subjects than in Japanese in spite of a lower rate of treatment for hypertension elderly in Laos. Those differences are probably due to different nutritional life style and to genetic difference between Laos and Japan.

We examined elderly over 65 years old in Japan, but in Laos we examined elderly over 60 years old, because the retirement age is 60 years and life expectancy is shorter in Laos than in Japan. So the mean age in subjects in Songkhon was slightly lower than that in Kyoto. For confirmation we also examined 204 elderly over '65 years' in Songkhon and analyzed comparatively with 411 elderly in Kyoto over 65 years. In this analysis all results (Tables 1–4) remained almost the same except for the prevalence of hypertension. In this analysis the mean age in Songkhon was higher (73.1 years) than in Kyoto (71.7 years) and the difference in the prevalence of hypertension was insignificant between two subject groups.

In blood chemical examinations, total cholesterol was lower and HDL cholesterol was much lower and consequently atherogenic index became higher in Laos than in Japan. Of particular note was the higher prevalence of anemia and impaired glucose tolerance in Lao elderly than in Japanese. This may be associated with the differences in intake of nutrition, lifestyles, prevalence of infectious diseases or other environmental, economic and hereditary factors between two groups. We are going to carry out further into why the prevalence of impaired glucose tolerance and anemia were

high in the Songkhon district and examine elderly in other areas in Laos in the near future.

Conclusion

Comparative findings of comprehensive geriatric assessment between community-dwelling elderly in Laos and in Japan were reported. Between the economically developing country and the highly developed one, there were differences of lifestyle and medical conditions. Most comprehensive geriatric functions such as ADLs, QOLs, mood and nutritional condition in blood chemistry were lower in the elderly in Songkhon (Laos) than in Kyoto (Japan). But the prevalence of hypertension and antihypertensive medication were lower in elderly in Laos than in Japan. Of particular note was the high prevalence of impaired glucose tolerance in Laos. Lower prevalence of hypertension and higher one of diabetes mellitus and anemia in the elderly population in Songkhon district should be examined in future studies.

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References

1 Matsubayashi K. Aging of population and its related subjects in Asia. *Jpn J Geriatr* 2002; **39**: 355–363.
2 Matsubayashi K, Okumiya K, Wada T, Osaki Y, Doi Y, Osawa T. Secular improvement in self-care independence of old people living in community in Kahoku, Japan. *Lancet* 1996; **347**: 60.
3 Wada T, Matsubayashi K, Okumiya K *et al.* Serum cholesterol levels and cognitive function assessed by P300 latencies in an older population living in the community. *J Am Geriatr Soc* 1997; **45**: 122–123.
4 Matsubayashi K, Okumiya K, Wada T, Osaki Y, Doi Y, Ozawa T. Cognitive and functional status of the Japanese oldest old. *J Am Geriatr Soc* 1997; **45**: 385–386.
5 Matsubayashi K, Okumiya K, Wada T, Doi Y, Ozawa T. Home-blood pressure control in Japanese hypertensive population. *Lancet* 1997; **350**: 290–291.
6 Matsubayashi K, Okumiya K, Nakamura T, Fujisawa M, Osaki Y. Global burden of disease. *Lancet* 1997; **350**: 144–144.
7 Matsubayashi K, Okumiya K, Wada T *et al.* Postural dysregulation in systolic blood pressure is associated with worsened scoring on neurobehavioral function tests and leukoaraiosis in the older elderly living in a community. *Stroke* 1997; **28**: 2169–2173.
8 Matsubayashi K, Okumiya K, Osaki Y, Fujisawa M, Doi Y. Frailty in elderly Japanese. *Lancet* 1999; **353**: 1445–1445.
9 Okumiya K, Matsubayashi K, Wada T *et al.* The timed 'Up and Go' test and manual button score are useful predictors of functional decline in basic and instrumental ADL in community-dwelling older people. *J Am Geriatr Soc* 1999; **47**: 497–498.
10 Okumiya K, Matsubayashi K, Wada T *et al.* A U-shaped association between home systolic blood pressure and four-year mortality in community-dwelling older men. *J Am Geriatr Soc* 1999; **47**: 1415–1421.
11 Matsubayashi K, Okumiya K, Wada T, Osaki Y, Fujisawa M, Doi Y, Ozawa T. Improvement in self-care independence may lower the increasing rate of medical expenses or community-dwelling older people in Japan. *J Am Geriatr Soc* 1998; **46**: 1484–1485.
12 Ho HK, Matsubayashi K, Wada T, Kimura M, Kita T, Saijoh K. Factors associated with ADL dependence: a comparative study of residential care home and community-dwelling elderly in Japan. *Geriatr Gerontol Int* 2002; **2**: 80–86.
13 Matsubayashi K, Ho HK, Okumiya K, Wada T, Ishine M, Kita T. Comprehensive geriatric assessment for community-dwelling elderly in Asia compared with those in Japan: I. Singapore. *Geriatr Gerontol Int* 2005; **5**: 99–106.
14 Sakagami T, Okumiya K, Ishine M *et al.* Comprehensive geriatric assessment for community-dwelling elderly in Asia compared with those in Japan: II. Hongchon in Korea. *Geriatr Gerontol Int* 2005; **5**: 107–114.
15 Wada T, Wada C, Ishine M *et al.* Comprehensive geriatric assessment for community-dwelling elderly in Asia compared with those in Japan: V. West Java in Indonesia. *Geriatr Gerontol Int* 2005; **5**: 168–175.
16 Ishine M, Wada T, Dung PT *et al.* Comprehensive geriatric assessment for community-dwelling elderly in Asia compared with those in Japan: III. Phuto in Vietnam. *Geriatr Gerontol Int* 2005; **5**: 115–121.
17 Devons CA. Comprehensive geriatric assessment: making the most of the aging years. *Curr Opin Clin Nutr Metab Care* 2002; **5**: 1–3.
18 Luk JK, Or KH, Woo J. Using the comprehensive geriatric assessment technique to assess elderly patients. *Hong Kong Med J* 2000; **6**: 93–98.
19 Nikolaus T, Specht-Leible N, Bach M, Oster P, Schlierf G. A randomized trial of comprehensive geriatric assessment and home intervention in the care of hospitalized patients. *Age Ageing* 1999; **28**: 543–550.
20 Nishinaga M. Comprehensive geriatric assessment for elderly patients. *Nippon Ronen Igakkai Zasshi* 2002; **39**: 279–281.
21 Wada T, Matsubayashi K, Okumiya K, Garcia Del Saz E, Kita T. Health status and subjective economical satisfaction in West Papua. *Lancet* 2002; **360**: 951.
22 Ho HK, Matsubayashi K, Lim FS, Sahadevan S, Kita T, Saijoh K. Hypertension in Japanese old-old. *Lancet* 2002; **359**: 804.
23 CIA *The World Fact Book 2005*. New York: CIA, 2005. [Cited 14 June 2005.] Available from URL: http://www.cia.gov/cia/publications/factbook.
24 Koyano W, Shibata H, Nakazato K, Haga H, Suyama Y. Measurement of competence: reliability and validity of the TMIG-index of competence. *Arch Gerontol Geriatr* 1991; **13**: 103–116.
25 Ishizaki T, Watanabe S, Suzuki T, Shibata H, Haga H. Predictors for functional decline among nondisabled older Japanese living in a community during a 3-year follow-up. *J Am Geriatr Soc* 2000; **48**: 1424–1429.
26 Sheikh JI, Yesavage JA. Geriatric Depression Scale (GDS) recent evidence and development of a shorter version. In:

Brink TL, ed. *Clinical Gerontology: a Guide to Assessment and Intervention*. New York: Haworth Press, 1986, 165–173.
27 Yesavage JA. Geriatric depression scale. *Psychopharmacol Bull* 1988; **24**: 709–771.
28 Morrison DP. The Crichton Visual Analogue Scale for the assessment of behavior in the elderly. *Acta Psychiatr Scand* 1983; **68**: 408–413.
29 Matsubayashi K, Okumiya K, Osaki Y, Fujisawa M, Doi Y. Quality of life of old people living in the community. *Lancet* 1997; **350**: 1521–1522.

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ORIGINAL ARTICLE

Comprehensive geriatric assessment for community-dwelling elderly in Asia compared with those in Japan: V. West Java in Indonesia

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Background: The objective of the present study is to compare the findings of comprehensive geriatric assessments between community-dwelling elderly in Indonesia and those in Japan.

Methods: A cross-sectional, interview- and examination-based was undertaken. Subjects of the study consisted of community-dwelling elderly living in two rural towns in Indonesia and in a town in Japan: 436 people aged 62 years and over who were living in two rural towns in west Java in Indonesia, and 411 people aged 65 years and over who were living in Kyoto, Japan. They were examined using a common comprehensive geriatric assessment tool. Interviews, or mail surveys were conducted pertaining to activities of daily living (ADL), medical and social history, quality of life (QOL) and the 15-item Geriatric Depression Scale, as well as anthropometric, neurobehavioral and blood chemical examinations were included in the assessment. The findings from the three groups were compared using ANOVA and Post Hoc Scheffe's *F*-test.

Results: The scores of basic ADLs, instrumental self-maintenance, intellectual activities, social role and Tokyo Metropolitan Institute of Gerontology Index of Competence (TMIG-IC) were lower in the two Indonesian towns than in Japan. The prevalence of depression (15-item Geriatric Depression Scale score of 6 or more and of 10 or more) was higher and QOL scores, except subjective sense of family and friend relationship, were lower in the Indonesian elderly subjects than in the Japanese ones. Mean blood pressure measurements and the proportion of subjects with systolic pressure > 140 mmHg or diastolic pressure > 90 mmHg was higher in Indonesia than in Japan while body mass index was lower in the Indonesians than in Japanese. Total cholesterol levels and blood hemoglobin levels were lower in the Indonesian elderly than in the Japanese.

Conclusion: In economically developing Indonesia, the elderly had lower ADLs and QOLs, than Japanese elderly. Of particular note is the higher rate of hypertension in West Java in Indonesia, which is probably associated with dietary habits. Although several trials

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for examining or caring system for old people have been implemented in Indonesia, they have begun only recently.

Keywords: ADL, community-dwelling elderly, comprehensive geriatric assessment, Indonesia, quality of life.

Introduction

Traditional thinking about the process of aging is changing as the distinction blurs between normal aging and disease. One of the myths about aging is that all older people are alike. However, one of the maxims of geriatrics is that as people get older they become less alike. Although the issue of distinguishing normal aging from disease poses challenges in the clinical setting, the inclusion of aging in the equation can also make the care of older people more intellectually stimulating.[1,2] To clarify the actual diversity of the elderly people in the world, international comparative case studies on geriatric findings are supposed to be useful.

Since 1990, we have carried out assessments of comprehensive geriatric functions of the community-dwelling elderly and provided efficient education to promote health in the elderly populations living in several towns in Japan.[3–13] We have found that diseases and degrees of frailty in community-dwelling old subjects are diverse and are influenced by ecologic differences such as natural environments, history, lifestyle, personal habits, religion and health promotion policies in the area.

In this paper, as the final of a consecutive series of five papers examining geriatric comparisons between Asian countries and Japan, we address the elderly living in West Java in Indonesia, which is one of the larger countries in Asia. Indonesia is the world's largest archipelago; it achieved independence from the Netherlands in 1949. Most of the people are Muslim (88%) and there are large groups of Protestant (5%), Roman Catholics (3%), Hindus (2%) and Buddhists (1%) in Indonesia. The population aged 65 years and over was 4.9% of the total in 2003, and life expectancy at birth is 68.9 years (male: 66.5, female 71.5).[14] Indonesia, a vast polyglot nation, faces severe economic development problems stemming from secessionist movements and the low level of security in the region. The proportion of the population living below poverty line was 27% in 1999. Indonesian GDP-per capita was $US3100 in 2002, that is 10.8% of the Japanese figure ($US28 700). To achieve appropriate policies to detect the ecology-related risk factors for frailty in the elderly and to prevent the disabilities of elderly population, and also to provide effective care services to the frail elderly, we investigated the preliminary comprehensive area studies with regard to health and diseases in West Java in Indonesia.

Methods

Subjects

Indonesia

A total of 436 subjects (175 male, 394 female; mean age, 72.3 years [SD, 7.3]; 44.8% of eligible subjects) from two towns, situated in the western part of the island of Java, were studied in February 2003. One is Srirahayu town, near Bandun city, and the other is Karawan town situated about 50 km east of the capital, Jakarta (Fig. 1). They have populations of 6965 and 11 505, respectively, and the proportions aged 65 years or older were 5.5% and 4.7%. Agriculture is the major industry and the spinning industry is also significant in Srirahayu while agriculture is also important in Karawan. Srirahayu is situated in a rather mountainous region while Karawan is situated in a coastal area. The population compositions of both towns are not notably different from other west Javan towns. All the elderly living in these towns were informed that they could have a health check-up including questionnaire, blood chemical examination, blood pressure measurement and consultation with a physician. Finally, 210 (82 male and 128 female; mean

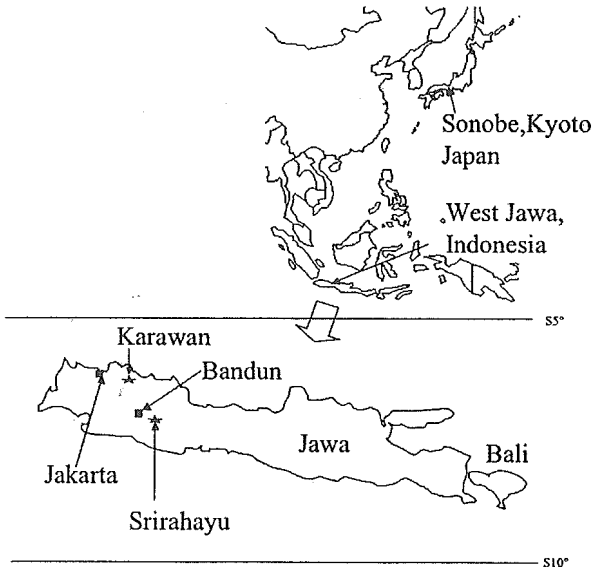

Figure 1 Map of the study area.

Table 1 Baseline characteristics of the community-dwelling elderly living in West Java and those in Japan

	Karawan, Indonesia ($n = 210$)	Srirahayu, Indonesia ($n = 226$)	Sonobe, Japan ($n = 411$)	*P*
Mean age (mean ± SD)	72.1 ± 6.9	72.5 ± 7.7	71.7 ± 4.8	NS
Male/female	82/128	93/133	174/237	NS
Marital status				< 0.0001
Widowed (%)	17.9	30.7	18.8	
Unmarried (%)	7.7	7.3	0.2	
Divorced (%)	0	1	0.7	
Drinking alcohol (%)				< 0.0001
Every day	0.5	0	22	
Sometimes	0.5	0.5	26.7	
Never	99	99.5	51.4	
Smoking (%)				< 0.0001
Current	39	31.6	13.8	
Past	9.7	9.4	14.1	
Never	51.2	58.9	72	
Medical				
History of stroke (%)				< 0.0001
Yes	0.5	2	4.0	
No	86.5	86.3	96.0	
Do not know	13	10.7	0.0	
History of heart disease (%)				< 0.0001
Yes	1.4	7.4	21.2	
No	90.8	78.8	78.8	
Do not know	7.7	23.5	0.0	
History of osteoarthropathy (%)				
Yes	21.6	23.4	59.4	< 0.0001
No	77.4	70.2	40.6	
Do not know	3.6	6.3	0.0	
History of fall (%)	35.5	36.9	12.8	< 0.0001

P-values are based on ANOVA for continuous variables and χ^2 test for categorical variables.
NS, not significant; SD, standard deviation.

age, 72.1years [SD 6.9]; 53.7% of eligible subjects) in Karawan and 226 subjects (93 male, 133 female; mean age, 72.5 years [SD 7.7]; 38.5% of eligible subjects) in Srirahayu participated in this survey and local physicians conducted the questionnaire survey.

Japan

Sonobe town is situated in Kyoto prefecture, a middle region of Japan, and has a population of 16 700 (Fig. 1). The demographic data, scores of ADLs, QOLs and medical data such as blood pressure were similar to the other Japanese towns, which we studied previously.[3–13,15] The proportion of the population aged 65 years or older in Sonobe was 20.0%. All the elderly living in this town were given a self-rating questionnaire by mail, and then they were invited to have their health status checked, including blood chemical examinations, blood pressure measurements and consultation with a physician in several community-houses called Kominkan. Finally, 411 elderly (174 male, 237 female; mean age, 71.7 years; 12.3% of eligible subjects) participated in this survey in October 2003.

Items of comprehensive geriatric assessment

The comprehensive geriatric assessment included activities of daily living (ADL), assessment of depression and quantitative assessment of quality of life (QOL) as well as medical and anthropometric indicators.

Activities of daily living

For the basic ADL assessment, each subject rated his/her independence in seven items (walking, ascending and descending stairs, feeding, dressing, making his/her toilet, bathing, grooming) as to the help needed. Each item was rated from 3 to 0 as follows: 3, completely

Table 2 Comparison of scores for activities of daily living (ADL) and quality of life (QOL) between the community-dwelling elderly living in West Java and those in Japan

	Karawan, Indonesia ($n = 210$)	Srirahayu, Indonesia ($n = 226$)	Sonobe, Japan ($n = 411$)	P
ADLs				
Scores of basic ADL, range 0–21 (mean ± SD)	20.3 ± 1.6	19.8 ± 2.6***	20.8 ± 0.7*,**	< 0.0001
% of independence in basic ADL	69.8	69.8	89.2	< 0.0001
Scores of information ADL, range 0–12 (mean ± SD)	10.7 ± 1.5	10.4 ± 1.6	11.7 ± 0.7*,**	< 0.0001
Scores of instrumental ADL, range 0–5 (mean ± SD)	2.8 ± 1.3	2.4 ± 1.6***	4.9 ± 0.5*,**	< 0.0001
% of independence of instrumental ADL	9.9	9.9	92.6	< 0.0001
Scores of intellectual activities, range 0–4 (mean ± SD)	1.0 ± 1.3	1.0 ± 1.4	3.7 ± 0.6*,**	< 0.0001
% of independence of intellectual activities	10.6	10.6	80.2	< 0.0001
Scores for social role, range 0–4) (mean ± SD)	3.1 ± 1.1	2.9 ± 1.3***	3.5 ± 1.0*,**	< 0.0001
% of independence of social role	47.1	47.1	69.2	< 0.0001
Scores of TMIG-IC, range 0–13 (mean ± SD)	6.9 ± 3.0	6.6 ± 3.4***	12.1 ± 1.6*,**	< 0.0001
% of independence of TMIG-IC	4.3	4.3	93	< 0.0001
Depression				
Scores of Geriatric Depression Scale, range 0–15 (mean ± SD)	4.3 ± 2.9	5.5 ± 3.5***	3.4 ± 3.2*,**	< 0.0001
% of GDS ≥ 6	33.8	33.8	22.7	0.0005
% of GDS ≥ 10	10.7	10.7	5.1	0.0008
QOLs range, 0–100				
Subjective health (mean ± SD)	61.4 ± 27.9	45.1 ± 25.4***	67.2 ± 17.8*,**	< 0.0001
Family relationships (mean ± SD)	80.9 ± 22.7	80.2 ± 21.9	81.5 ± 16.9	NS
Relationships with friends (mean ± SD)	78.8 ± 21.1	79.2 ± 20.2	79.8 ± 16.7	NS
Financial satisfaction (mean ± SD)	46.8 ± 24.9	38.7 ± 24.6***	64.0 ± 21.5*,**	< 0.0001
Subjective happiness (mean ± SD)	73.4 ± 26.0	58.3 ± 27.6***	73.2 ± 17.6**	< 0.0001

*$P < 0.05$ between Karawan and Sonobe in Post Hoc Scheffe's F-test.
**$P < 0.05$ between Srirahayu and Sonobe in Post Hoc Scheffe's F-test.
***$P < 0.05$ between Srirahayu and Karawan in Post Hoc Scheffe's F-test.
P-value are based on ANOVA for continuous variables and χ^2 test for categorical variables.
ADL, activities of daily living; QOL, quality of life; SD, standard deviation; TMIG-IC, Tokyo Metropolitan Institute of Gerontology Index of Competence.

independent; 2, need some help; 1, need much help; 0, completely dependent). The items were added to give scores ranging from 0 to 21, with low scores indicating disability.[3] Information-related functioning was defined by scores summed from those for four items (visual acuity, hearing acuity, conversation and memory in one day) using a rating scale from 0 (cannot at all) to 3 (completely independent) into a score in the range of 0–12. For higher-level functional capacity, each subject rated his/her independence in the Tokyo Metropolitan Institute of Gerontology index of competence (TMIG-IC).[16,17] This assessment consists of a 13-item index including three sublevels of competence: (i) instrumental self-maintenance (five items: the ability to use public transport, buy daily necessities, prepare a meal, pay bills and handle banking matters all rated on a yes/no basis); (ii) intellectual activity (four items: the ability to fill in forms, read newspapers, read books or magazines and take interest in television programs or news articles on health-related matters all rated on a yes/no basis); and (iii) social role (four items: the ability to visit friends, give advice to relatives and friends who confide, visit someone at a hospital and initiate conversation with younger people all rated on a yes/no basis).

Depression and quality of life scores

We screened for depressive symptoms using the Japanese version of the 15 item-Geriatric Depression Scale (GDS-15).[18–21] GDS-15 was used for depression screening and it took approximately 4 min to complete and score. Using a cut-off point of 6 or more, the GDS-15 has a sensitivity of 88% to 92% and specificity of 62% to 81%, as compared with a structured clinical interview for depression in Western countries.[22–24] In Japan, Schreiner *et al.* reported the cut-off point for GDS-15

Table 3 Comparison of anthropometrical indicators and blood pressure between the community-dwelling elderly in West Java and those in Japan

	Karawan, Indonesia ($N = 210$)	Srirahayu, Indonesia ($N = 226$)	Sonobe, Japan ($N = 411$)	P
Anthropometrical				
Height (mean ± SD in cm)	151.4 ± 7.8	150.4 ± 9.2	154.2 ± 8.6*,**	< 0.0001
Weight (mean ± SD in kg)	44.0 ± 9.0	44.0 ± 9.9	53.9 ± 8.7*,**	< 0.0001
Body mass index (mean ± SD)	19.2 ± 3.7	19.4 ± 4.6	22.6 ± 2.7*,**	< 0.0001
Blood pressure				
Systolic blood pressure (mean ± SD) (mmHg)	164 ± 29	159 ± 30	141 ± 20*,**	< 0.0001
Diastolic blood pressure (mean ± SD) (mmHg)	91 ± 14	95 ± 20***	78 ± 11*,**	< 0.0001
Prevalence of hypertension, SBP > 140 or DBP > 90 (%)	78.9	75.3	48.7	< 0.0001

*$P < 0.05$ between Karawan and Sonobe in Post Hoc Scheffe's F-test.
**$P < 0.05$ between Srirahayu and Sonobe in Post Hoc Scheffe's F-test.
***$P < 0.05$ between Srirahayu and Karawan in Post Hoc Scheffe's F-test.
P-values are based on ANOVA for continuous variables and χ^2 test for categorical variables.
DBP, diastolic blood pressure; SBP, systolic blood pressure; SD, standard deviation.

using Japanese subjects was found to be the same as those reported using Western subjects.[25] But in Indonesia, a validation study of GDS-15 has not yet reported. Thus, the definition of depression was unified with cut-off points at a GDS-15 score of 6 or more in both countries, and then cut-off point of a GDS-15 score of 10 or more was used for reference. We defined depression as a GDS-15 score of 6 or more, with a score of 6–9 indicating 'mild depression', and a score of 10 or more indicating 'severe depression'. QOL was assessed using a 100 mm visual analog scale (worst QOL on the left end of the scale, best on the right) based on the following five items; subjective sense of health, status of relationships with family, status of relationships with friends, financial status and subjective happiness.[26–28]

Social, anthropometric and medical assessments

Living condition, lifestyle (drinking alcohol and smoking), and medical histories (histories of stroke, heart disease and osteoarthropathies) were also assessed. Two blood pressure measurements were taken in a sitting position by auto-sphygmomanometer (HEM 757, Omron, Japan) and were averaged to produce the blood pressure level of the subjects. In Indonesia, blood chemical analysis was done in the studied area by portable blood chemical analyzer (SP-4420, Arklay, Japan), and in Japan it was done by the blood chemical company, SRL. Blood sugar was measured casually both in Indonesia and in Japan.

Statistical analysis

Statistical analysis was performed using StatView ver.5 for Macintosh (SAS institute, Inc., Cary, NC). The one-factor ANOVA was used for continuous variables and χ^2 test was used for categorical variables. P-values of less than 0.05 were considered to indicate statistical significance. In the case, P-values less than 0.05 by one-factor ANOVA, Post Hoc Scheffe's F-test were performed to compare the scores between the two towns.

Results

Table 1 shows the comparison of baseline characteristics among the elderly subjects living in the three towns, Karawan and Srirahayu in Indonesia, and Sonobe, Kyoto, in Japan. There were no significant differences in mean age among the three groups. The percentage of unmarried was higher in Karawan (7.7%) and Srirahayu (7.3%) than in Japan (0.2%). Subjects who currently smoke were more numerous in Karawan (39.0%) and Srirahayu (31.6%) than in Sonobe, Kyoto. On the other hand, subjects who drink alcohol were rare in Muslim Indonesia. The rate of subjects who were aware of their apparent history of heart diseases or stroke was higher in Japan than in Indonesia, but many elderly in Srirahayu (23.5%) did not know if they had suffered heart disease or not. The rates of osteoarthropathy were not so common in the two towns in Indonesia (Karawan, 21.6%; Srirahayu, 23.4%) than in Sonobe, Kyoto (59.4%). Histories of falls during the previous year were more common in Indonesia (Karawan, 35.5%; Srirahayu, 36.9%) than in Sonobe, Kyoto (12.8%).

Table 2 shows the comparison of scores in ADLs, GDS-15 scores and quantitative QOLs among community-dwelling elderly living in Indonesia (Karawan and Srirahayu) and in Japan. Scores for basic ADL, instrumental self-maintenance, intellectual activities, social

Table 4 Comparison of blood chemical findings between the community-dwelling elderly in West Java and in those in Japan

	Karawan, Indonesia ($N = 210$)	Srirahayu, Indonesia ($N = 226$)	Sonobe, Japan ($N = 411$)	P
Total cholesterol, mean ± SD (mg/dL)	158.2 ± 28.2	137.7 ± 25.4***	209.5 ± 35.0*,**	< 0.0001
HDL-cholesterol, mean ± SD (mg/dL)	32.5 ± 11.5	42.6 ± 9.9***	65.6 ± 16.7*,**	< 0.0001
Atherogenic Index, mean ± SD	4.7 ± 2.9	2.4 ± 0.9***	2.4 ± 0.9*	< 0.0001
Creatinine, mean ± SD (mg/dL)	1.01 ± 0.22	1.03 ± 0.32	0.89 ± 0.19*,**	< 0.0001
Casual blood sugar, mean ± SD (mg/dL)	113.7 ± 43.0	96.1 ± 29.5***	99.3 ± 21.1*	0.01
% of impaired glucose tolerance, BS ≥ 140 mg/dL	11.9	2	4.4	< 0.0001
Hemoglobin, mean ± SD (g/dL)	10.8 ± 1.9	10.6 ± 1.8	13.6 ± 1.4*,**	< 0.0001
% of anemia (men: Hb < 13 g/dL, women: Hb < 12 g/dL)	80.6	89	12.0	< 0.0001
Uric acid, mean ± SD (mg/dL)	4.6 ± 1.5	5.2 ± 1.8	5.0 ± 1.3	NS
GOT, mean ± SD (IU/L)	17.6 ± 5.6	22.0 ± 5.8***	25.5 ± 16.2*,**	< 0.0001
GPT, mean ± SD (IU/L)	14.0 ± 6.4	19.0 ± 9.1***	20.8 ± 22.3*	0.0002

*$P < 0.05$ between Karawan and Sonobe in Post Hoc Scheffe's F-test.
**$P < 0.05$ between Srirahayu and Sonobe in Post Hoc Scheffe's F-test.
***$P < 0.05$ between Srirahayu and Karawan in Post Hoc Scheffe's F-test.
P-value based on ANOVA for continuous variables and χ^2 test for categorical variables.
SD; Standard Deviation.

roles and TMIG-IC were higher in Japan than in the two Indonesian towns. In comparison with Indonesian towns, scores for some ADLs were lower in the elderly in Srirahayu than in Karawan. The mean score of GDS-15 and the prevalence of depression (GDS ≥ 6) and severe depression (GDS ≥ 10), were significantly higher in Indonesian elderly subjects than in Japanese. The prevalence of depression (GDS ≥ 6) was higher in women than in men in these three groups, but the difference was more obvious in Srirahayu than in the other two towns (Karawan, men 25.0% and women 27.3%; Srirahayu, men 22.4%, women 53.3%; Kyoto, men 21.0%, women 23.6%). Indonesian elderly had significantly lower scores in QOL items of subjective sense of health and financial satisfaction than Japanese elderly but there were no differences in subjective sense of family and relationships with friends. Scores for a subjective sense of happiness were lowest in the elderly in Srirahayu.

Table 3 shows the comparison of anthropometrical indicators among the three elderly groups. Systolic and diastolic blood pressure were higher in Indonesian elderly subjects than in the Japanese, but body mass index was higher in Japanese elderly subjects than in the Indonesians. The prevalence of subjects with systolic pressure > 140 mmHg or diastolic pressure > 90 mmHg, based on the measurements of casual blood pressure, was very much higher in Indonesian subjects than in Japanese.

Table 4 shows the comparison of blood chemical findings among the three elderly groups. The levels of serum total cholesterol, HDL, GOT and hemoglobin were all lower in Indonesian subjects than in the Japanese. Creatinine was higher in Indonesians than in Japanese subjects. Atherogenic index and blood sugar levels were significantly higher in subjects in Karawan than in Japanese, while there were no significant differences between elderly subjects in Srirahayu and in Japan.

Discussion

We found that the Indonesian elderly had a lower score in basic ADL and TMIG-IC than Japanese subjects. Differences in scores in ADLs between Indonesian and Japanese elderly were more obvious in regard to higher functional capacity such as instrumental ADL and intellectual ADL than in the basic ADL. These higher functions may be more influenced by differences in economic status, infrastructure and educational level between two countries than the basic ADL, because the instrumental ADL is associated with economic activities such as public transportation and shopping. In Karawan and Srirahayu, small and crowded vans were only means of public transportation, such transportation can be difficult for the elderly to utilize. Intellectual activities depend on the literacy of old people. The proportion of people (15 years old or over) who can read and write was 88.5% (male, 92.9%; female, 84.1%) in Indonesia,[14] while in Japan it was 99.8% in 2003. An accurate literacy rate for Indonesian elderly was not available, but that seems to be lower than 88.5%. It was also found that the

prevalence of depression was higher and quantitative QOLs were lower in Indonesian elderly subjects than in those in Japan. Analysis of other factors that contribute to lower QOL in Indonesian elderly, such as details of social, economic or spiritual environment remain to be determined due to limitations of this study.

Indonesian elderly people had lower body height, body mass and BMI than Japanese subjects. Mean systolic blood pressure measurements and rates of subjects with systolic pressure > 140 mmHg or diastolic pressure > 90 mmHg was very much higher in Indonesian elderly subjects than in their Japanese counterparts in spite of lower BMIs in Indonesians. This dissociation is presumed to be due to differences in nutrition including salt intake and to genetic differences between Indonesians and Japanese.[29]

Total cholesterol, HDL and hemoglobin concentrations were lower in Indonesian elderly than in Japanese. This may be associated with the differences in intake of nutrition, lifestyles, prevalence of infectious diseases or other environmental, economic and hereditary factors among the three groups.

Comparing the elderly subjects in Srirahayu and Karawan, ADLs, QOLs, total cholesterol and blood sugar level were significantly lower in elderly subjects in Srirahayu than those in Karawan. That may be due to poorer economic conditions or the mountainous terrain in Srirahayu. The reason for a higher prevalence of elderly subjects with impaired glucose tolerance in Karawan than in Srirahayu might be, partly due to recent economic development and the changing lifestyle in Karawan.

The increased life expectancy in Indonesia has resulted in increasing numbers of older people living in the community. However, there are limited health services and resources available for older people compared to those seen for younger people. Institutional care facilities such as nursing homes are not widely available and not commonly used in Indonesia. Consequently, when older people's functional ability declines, the required care is usually provided by their family or relatives.[30] It is still normal practice for older people in Indonesia to stay with their married daughter or daughter in-law. This trend is now changing as nuclear families are becoming more common, especially in large cities. Several private charity day-services for the aged poor in the community are provided by wealthy philanthropic individuals (Fig. 2). The aged poor who came together to the house of a rich man were provided several services such as Koran readings, exercise and provision of lunch and dinner boxes. Islamism encourages charity.

Although the population of 65 years and over was only 4.9% in 2003, several trials to care for the elderly have been introduced in Indonesia. A nationwide public geriatric examination system called 'poswindu', which joins 'posuyandu', introduced 20 years before as a health check system for mothers and children, was started in 2002 in Indonesia. And, in line with WHO recommendations not to institutionalize older people, it has been argued that relevant government agencies should develop policies and programs to strengthen family and community-based support and assist older people by promoting active and healthy aging in Indonesia. To improve family care-givers' capabilities and attitudes in caring for older people in the community, some training trials were implemented.[31] These trials for caring older people in Indonesia are now getting under way.

Figure 2 Scene from a privately funded charity day-care service for the elderly poor in Indonesia.

Conclusion

Comparative findings of comprehensive geriatric assessment of community-dwelling elderly between West Java in Indonesia and Japan were reported. In economically developing Indonesia, the elderly had lower ADLs and QOLs than Japanese elderly. Of particular note is the high rate of subjects with systolic pressure > 140 mmHg or diastolic pressure > 90 mmHg in West Java in Indonesia, this is probably associated with dietary habits. Understanding of the need for controlling chronic risk factors such as hypertension was less popularly spread among community-dwelling elderly in Indonesia than in Japan. Although several trials for examining or caring system for old people have been implemented in Indonesia, they are now getting under way.

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References

1 Peterson M. Physical aspects of aging: is there such a thing as 'normal'? *Geriatrics* 1994; **49**: 45–49.
2 Matsubayashi K. Comment on 'Physical aspects of aging: is there such a thing as "normal"?'. *Geriatrics Int* 1995; **6**: 26–29.
3 Matsubayashi K, Okumiya K, Wada T, Osaki Y, Doi Y, Ozawa T. Secular improvement in self-care independence of old people living in community in Kahoku, Japan. *Lancet* 1996; **347**: 60.
4 Wada T, Matsubayashi K, Okumiya K *et al.* Serum cholesterol levels and cognitive function assessed by P300 latencies in an older population living in the community. *J Am Geriatr Soc* 1997; **45**: 122–123.
5 Matsubayashi K, Okumiya K, Wada T, Osaki Y, Doi Y, Ozawa T. Cognitive and functional status of the Japanese oldest old. *J Am Geriatr Soc* 1997; **45**: 385–386.
6 Matsubayashi K, Okumiya K, Wada T, Doi Y, Ozawa T. Home blood-pressure control in Japanese hypertensive population. *Lancet* 1997; **350**: 290–291.
7 Matsubayashi K, Okumiya K, Nakamura T, Fujisawa M, Osaki Y. Global burden of disease. *Lancet* 1997; **350**: 144.
8 Matsubayashi K, Okumiya K, Wada T *et al.* Postural dysregulation in systolic blood pressure is associated with worsened scoring on neurobehavioral function tests and leukoaraiosis in the older elderly living in a community. *Stroke* 1997; **28**: 2169–2173.
9 Matsubayashi K, Okumiya K, Osaki Y, Fujisawa M, Doi Y. Frailty in elderly Japanese. *Lancet* 1999; **353**: 1445.
10 Okumiya K, Matsubayashi K, Nakamura T *et al.* The timed 'Up & Go' test and manual button score are useful predictors of functional decline in basic and instrumental ADL in community-dwelling older people. *J Am Geriatr Soc* 1999; **47**: 497–498.
11 Okumiya K, Matsubayashi K, Wada T *et al.* A U-shaped association between home systolic blood pressure and four-year mortality in community-dwelling older men. *J Am Geriatr Soc* 1999; **47**: 1415–1421.
12 Matsubayashi K, Okumiya K, Wada T *et al.* Improvement in self-care may lower the increasing rate of medical expenses for community-dwelling older people in Japan. *J Am Geriatr Soc* 1998; **46**: 1484–1485.
13 Wada T, Ishine M, Kita T, Fujisawa M, Matsubayashi K. Depression screening of elderly community-dwelling Japanese. *J Am Geriatr Soc* 2003; **51**: 1328–1329.
14 CIA. *The World Fact Book.* 2003.
15 Wada T, Ishine M, Sakagami T *et al.* Depression in Japanese community-dwelling elderly–prevalence and association with ADL and QOL. *Arch Gerontol Geriat* 2004; **39**: 15–23.
16 Ishizaki T, Watanabe S, Suzuki T, Shibata H, Haga H. Predictors for functional decline among nondisabled older Japanese living in a community during a 3-year follow-up. *J Am Geriatr Soc* 2000; **48**: 1424–1429.
17 Koyano W, Shibata H, Nakazato K, Haga H, Suyama Y. Measurement of competence: reliability and validity of the TMIG Index of Competence. *Arch Gerontol Geriat* 1991; **13**: 103–116.
18 Niino N, Imaizumi T, Kawakami N. A Japanese translation of the Geriatric Depression Scale. *Clin Gerontol* 1991; **10**: 85–87.
19 Koyano W, Hashimoto M, Fukawa T, Shibata H, Gunji A. Functional capacity of the elderly: measurement by the TMIG Index of Competence. *Nippon Koshu Eisei Zasshi* 1993; **40**: 468–474.
20 Sheikh JI, Yesavage JA. Geriatric Depression Scale (GDS); Recent evidence and development of a shorter version. In: Brink TL, eds. *Clinical Gerontology: A Guide to Assessment and Intervention.* New York: Haworth Press, 1986; 165–173.
21 Yesavage JA. Geriatric Depression Scale. *Psychopharmacol Bull* 1988; **24**: 709–711.
22 Gerety MB, Williams JW Jr, Mulrow CD *et al.* Performance of case-finding tools for depression in the nursing home: influence of clinical and functional characteristics and selection of optimal threshold scores. *J Am Geriatr Soc* 1994; **42**: 1103–1109.
23 Lyness JM, Noel TK, Cox C, King DA, Conwell Y, Caine ED. Screening for depression in elderly primary care patients. A comparison of the Center for Epidemiologic Studies-Depression Scale and the Geriatric Depression Scale. *Arch Intern Med* 1997; **157**: 449–454.
24 Herrmann N, Mittmann N, Silver IL *et al.* A validation study of the Geriatric Depression Scale short form. *Int J Geriatr Psych* 1996; **11**: 457–460.
25 Schreiner AS, Hayakawa H, Morimoto T, Kakuma T. Screening for late life depression: cut-off scores for the Geriatric Depression Scale and the Cornell Scale for Depression in Dementia among Japanese subjects. *Int J Geriatr Psych* 2003; **18**: 498–505.
26 Morrison DP. The Crichton Visual Analogue Scale for the assessment of behaviour in the elderly. *Acta Psychiatr Scand* 1983; **68**: 408–413.
27 Matsubayashi K, Okumiya K, Osaki Y, Fujisawa M, Doi Y. Quality of life of old people living in the community. *Lancet* 1997; **350**: 1521–1522.
28 Matsubayashi K, Wada T, Okumiya K *et al.* Comparative study of quality of life in the elderly between in Kahoku and in Yaku. *Nippon Ronen Igakkai Zasshi* 1994; **31**: 790–799.
29 Staessen J, Bulpitt CJ, Fagard R, Joossens JV, Lijnen P, Amery A. Salt intake and blood pressure in the general population: a controlled intervention trial in two towns. *J Hypertens* 1988; **6**: 965–973.
30 Rudkin L. Dependency status and happiness with old age on Java. *Gerontologist* 1994; **34**: 217–223.
31 Sahar J, Edwards H. Improvement of family carers' knowledge, skills and attitudes in caring for older people following the implementation of a Family Carers' Training Program in the community in Indonesia. *Int J Nurs Pract* 2003; **9**: 246–254.

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脳血管疾患の再発に対する高脂血症治療薬 HMG-CoA還元酵素阻害薬の予防効果に関する研究

Japan Statin Treatment Against Recurrent Stroke (J-STARS)

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雑誌（Ⅱ）

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Impact of Metabolic Syndrome as a Risk Factor for Atherothrombotic Stroke

Key words: cerebral infarction, visceral obesity, ultrasonography

In recent years, cerebral infarction, myocardial infarction, and peripheral artery disease are categorized into a comprehensive concept termed atherothrombosis since they have a common pathophysiological process, that is, obstruction by blood clot triggered by rupture of unstable plaque formed during atherosclerosis of the arteries. According to the 2002 report from the World Health Organization (WHO), atherothrombosis is the leading cause of death in the world, which occupies 28% of total death (The World Health Report. WHO Geneva, 2002). We conducted a nationwide survey for the current status of thrombotic diseases and antithrombotic therapy by sending a questionnaire to 3,357 physicians, who were extracted by random sampling among 11,697 physicians to treat patients with vascular diseases (1). A total of 1,784 (53%) physicians responded to the queastionnaire. The estimated number of patients with cerebral infarction and myocardial infarction calculated from the formula of total sample number divided by collection rate and extraction rate, was 1.4 to 1.8 million and 0.7 to 0.8 million, respectively. This ratio of cerebral infarction to myocardial infarction (the prevalence of cerebral infarction is more than double that of myocardial infarction) is just opposite in the United States; the prevalence of myocardial infarction is more than two times higher than that of cerebral infarction. Therefore, our survey showed that the Japanese population is prone to cerebral infarction much more than myocardial infarction among atherothrombotic diseases in comparison with American population.

The national Metabolic Syndrome Criteria Study Group has very recently published new criteria of the metabolic syndrome (2). In these criteria, visceral obesity is emphasized as a key component in the upstream of metabolic cascade leading to diabetes mellitus, dyslipidemia, and hypertension. According to the Hisayama Study, prevalence of obesity as well as diabetes mellitus and hyperlipidemia as risk factors for stroke has been exponentially increased during recent decades (3). It is known that visceral obesity is more important than generalized obesity as a risk factor for cardiovascular disease (4, 5). Visceral fat deposit has been estimated by abdominal CT scan. In the last issue, Kawamoto et al have reported an association of metabolic syndrome with ischemic stroke (6).

They used ultrasonography instead of CT to evaluate the accumulation of visceral fat as one of the five components (visceral obesity, hypertension, hypertriglyceridemia, low high-density-lipoprotein cholesterol, and diabetes mellitus) (7). They had previously demonstrated that preperitoneal and subcutaneous fat thickness on ultrasonogaphy could reflect body fat distribution more accurately (8). They showed that the metabolic syndrome is associated with atherothrombotic stroke and that an increased risk of atherothrombotic stroke is associated with increases in the numbers of the five components of the metabolic syndrome (6).

The metabolic syndrome had been studied as a risk factor for cardiovascular disease. However, Ninomiya et al (9) reported that metabolic syndrome is associated with not only myocardial infarction but also or even more with cerebral infarction. Current epidemiological studies have demonstrated that the ratio of atherothrombotic stroke is gradually increasing among subtypes of ischemic stroke among Japanese patients. According to a nationwide survey or a registry of acute ischemic stroke such as the Japanese Multicenter Stroke Investigators Collaboration (J-MUSIC) (10) or the Japan Standard Stroke Registration Study (JSSRS) (11), the prevalence of atherothrombotic stroke is going to exceed that of lacunar stroke, which has been the leading subtype of ischemic stroke in Japan. Analyses for comparisons between different areas in Japan by the J-MUSIC indicated that the prevalence of atherothrombotic stroke as well as diabetes mellitus and hyperlipidemia is higher in Kanto (Tokyo urban) and Kinki (Osaka urban) areas than in other rural areas (10). Therefore, it is suggested that the increase in atherothrombotic stroke is associated with increases in diabetes mellitus and hyperlipidemia, which are the downstream components of the metabolic syndrome. The impact of the metabolic syndrome as a risk factor for stroke is becoming greater, and thus strategy against the metabolic syndrome should be warranted for stroke prevention.

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References

1) Uchiyama S, Hori M, Nakamura Y and the Antithrombotic Therapy

Study Group. Nationwide survey for current status of antithrombotic therapy in Japan. Jpn J Thromb Hemost **14**: 458, 2003.
2) Metabolic Syndrome Criteria Study Group. Definition and criteria for metabolic syndrome. Jpn J Intern Med **4**: 188–203, 2005 (in Japanese).
3) Fujishima M, Kiyohara Y, Ueda K, Hasuo Y, Kato I, Iwamoto H. Smoking as cardiovascular risk factor in low cholesterol population: The Hisayama Study. Clin Exp Hypert **A14**: 99, 1992.
4) Kissebach AH, Vydelingum N, Murray R, et al. Relation of body fat distribution to metabolic complication of obesity. J Clin Endocrinol Metab **54**: 254–260, 1982.
5) Matsuzawa Y, Fujioka S, Tokunaga K, Tarui S. Classification of obesity with respect to morbidity. Proc Soc Exp Biol Med **200**: 197–200, 1992.
6) Kawamoto R, Tomita H, Oka Y, Kodama A. Metabolic syndrome as a predictor of ischemic stroke in elderly persons. Intern Med **44**: 922–927, 2005.
7) National Cholesterol Education Program. Executive Summary of the Third National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III). JAMA **285**: 2486–2497, 2001.
8) Kawamoto R, Kajiwara T, Oka Y, Takagi Y. Association between abdominal wall fat index and carotid atherosclerosis in women. J Atheroscler Thromb **9**: 213–218, 2002.
9) Ninomiya JK, L'Italien G, Criqui MH, Whyte JL. Gamst A, Chen RS. Association of the metabolic syndrome with history of myocardial infarction and stroke in the Third National Health and Nutrition Examination Survey. Circulation **109**: 42–46, 2004.
10) Yamaguchi T. Study on the status in the management of acute ischemic stroke. The Health Science General Research Project. Research Report 2000, 2001.
11) Kobayashi S. Stroke Data Bank 2005, Nakayama Shoten, Tokyo, 2005.

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Clinical Characteristics of Stroke Patients with Antiphospholipid Antibodies

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Key Words
Antiphospholipid syndrome · Cerebral infarction

Abstract
Background: Antiphospholipid syndrome is important as a cause of ischemic stroke, although clinical characteristics of the syndrome are not well documented. ***Methods:*** We analyzed differences in clinical characteristics between 40 antiphospholipid-antibody (aPL)-positive and 40 aPL-negative stroke patients. ***Results:*** Stroke patients with aPL were significantly younger and were more likely to be women in comparison with stroke patients without aPL. Valvular heart disease, neurological complications and hematological disorders were more frequent in the aPL-positive group. The mean value of thrombin-antithrombin III complex was significantly lower in the aPL-positive group. Cerebral infarctions in the carotid system were less and large-artery lesions more frequent in the aPL-positive patients. ***Conclusions:*** Stroke patients with aPL have clinical characteristics distinct from stroke patients without aPL.

Introduction

Antiphospholipid syndrome (APS) is an acquired coagulopathy characterized by antiphospholipid antibodies (aPL), vascular thrombosis and recurrent pregnancy loss. APS is also important as a cause of ischemic stroke. For example, it is known that aPL are a causative factor for stroke in a large number of young stroke patients. Although a great variety of clinical features have been described in patients with APS, there are few reports describing the clinical differences between aPL-positive and aPL-negative stroke patients [1]. The aim of the present study is to analyze the clinical characteristics of aPL-positive stroke patients and compare them with those of aPL-negative stroke patients. We compared gender, age, stroke risk factors, associated diseases, hemostatic markers and radiological findings between aPL-positive and aPL-negative patients with acute ischemic stroke.

Patients and Methods

Between 1996 and 2001, we enrolled 40 consecutive aPL-positive patients with acute ischemic stroke admitted to the Department of Neurology, Tokyo Women's Medical University. Patients fulfilled the Sapporo criteria for diagnosis of APS [2]. Patients with aPL were required to show anticardiolipin IgG antibodies (aCL

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