

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

	Choa Chu Kang, Singapore	Urausu, Japan	P
Total protein (g/dL)	7.1 ± 0.4	7.3 ± 0.4	0.0292
Albumin (g/dL)	4.1 ± 0.2	4.2 ± 0.2	0.004
Total cholesterol (mg/dL)	213 ± 38	198 ± 33	0.0009
HDL-cholesterol (mg/dL)	52 ± 12	55 ± 14	0.0759
Atherogenic index	3.2 ± 1.1	2.8 ± 1.1	0.0071
BUN (mg/dL)	7.9 ± 2.6	19.0 ± 4.6	< 0.0001
Creatinine (mg/dL)	1.0 ± 0.3	1.0 ± 0.2	NS
Blood sugar (mg/dL)	103 ± 55	109 ± 34	NS
Impaired glucose tolerance [†] (%)	19.8	4.4	< 0.0001
Hemoglobin (g/dL)	12.8 ± 1.4	13.2 ± 1.5	0.0543

Values for continuous variables are given as means ± SD.

Atherogenic index, (TC-HDL-C)/HDL-C; NS, not significant.

[†]Impaired glucose tolerance defined as blood sugar ≥ 140 mg/dL.

Table 4 shows the comparison of blood chemical findings between the two elderly groups. Levels of both serum total protein and albumin were higher in Japanese subjects than in Singaporean ones, however, conversely total cholesterol levels and atherogenic index were higher in Singaporean subjects than in Japanese ones. There were no significant differences in blood hemoglobin levels or renal functional indicators.

Discussion

The importance of comprehensive geriatric assessment for the elderly has been revealed in the geriatric medical field in several validated studies.^{28,29} Since 1990, we have introduced the comprehensive geriatric assessment for community-dwelling elderly people living in several towns in Japan and have produced some diverse findings.³⁰ Human aging phenomena and the prevalence of diseases are modified by differences in natural ecology and social sense of value or human culture.³¹⁻³⁵ However, cross-cultural or cross-ecologic studies using comprehensive assessments for the elderly have been limited to organ- or disease-specific areas.³⁶ Therefore we applied the common method of comprehensive geriatric assessment to community-dwelling elderly populations living in several countries in Asia compared with the findings of community-dwelling elderly living in Japan.

Although a small country, Singapore is one of the more highly developed countries in the world and has second greatest aging population in Asia, after Japan. It was founded as a British trading colony in 1819 and joined the Malaysian Federation in 1963 but separated two years later and became independent. It subsequently became one of the world's most prosperous countries with strong international trading links and with per capita GDP equal to that of the leading nations of Western Europe (Fig. 2). The total population of

Singapore is 4 608 595 people (July 2003) and the proportion of the population aged 65 years and over is 7.2% (2003). Life expectancy at birth in Singapore is 77.6 years in men and 83.6 years in women.³⁷ There are four main ethnic groups in Singapore: 76.7% are Chinese, 14% are Malay, 7.9% Indian and 1.4% are other ethnicities.

In spite of the differences in dwelling circumstances and climate between Choa Chu Kang (an urban city community) in Singapore (in a tropical region) and Urausu (a rural town) in Japan (in a temperate region), there was no difference between the two elderly groups in general lifestyle, such as living alone, drinking alcohol, smoking and working or doing exercise every day. However, the number of elderly subjects with a family physician was lower in the Singaporean elderly subjects than in the Japanese, which explains the lower rate of taking antihypertensive medications or lower rate of recognized histories of heart disease and osteoarthropathies.

In the comparison of ADLs between Singaporean elderly subjects and Japanese ones, there was a difference only in intellectual activities probably due to the differences between two countries in past educational systems. In the colonial era, many children in Singapore were under-educated, while the primary educational system had been established even before World War II in Japan. Of particular note was the lower prevalence of depression and higher quantitative QOLs in Singapore than in Japan, probably due to close and intimate family relationships among Singaporean elderly, which were the same in many Chinese families in the world. Analysis of other factors contributing to a higher QOL in the Singaporean elderly such as detailed social, economic or spiritual factors rather than physical or mental ones remain to be determined due to the limitations of this study. The higher QOL in subjective health in the Singaporean elderly might be due to a lack of self-recognition of diseases informed by a family physician.

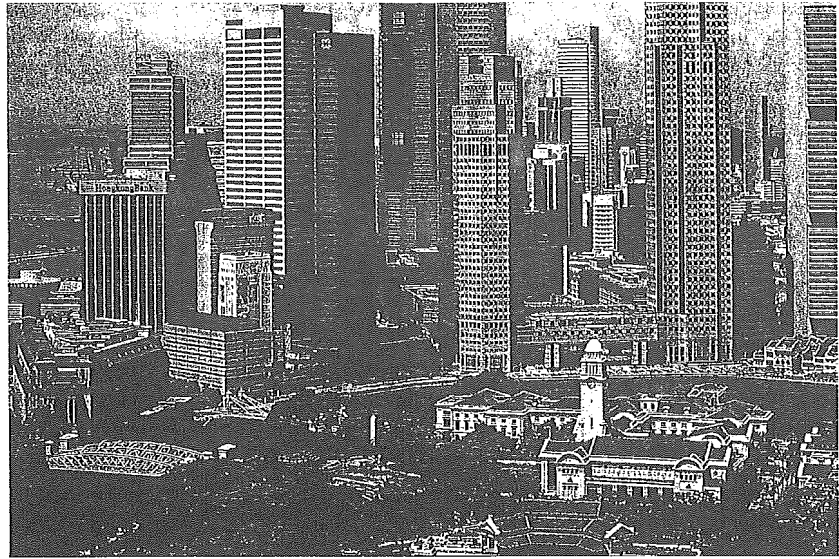


Figure 2 Singapore has become one of the world's most prosperous countries with strong international trading links and with per capita GDP equal to that of the leading nations of Western Europe.

In anthropometrical functions, Singaporean elderly people had higher BMIs than the Japanese probably due to genetic differences and to more a Westernized and civilized lifestyle in Singapore. Singaporean elderly subjects surveyed were all retired city-dwellers, while most of elderly people in Urausu in Japan were retired or still active farmers. Mean blood pressure measurements and the prevalence of hypertension were higher in Singaporean elderly subjects than in Japanese ones because of lower rate of treatment of hypertensive elderly in Singapore. Further longitudinal studies of hypertensive elderly patients with special reference to subsequent cardiovascular events in Singapore would be needed.³⁸ Significantly lower scores in cognitive function tests such as mini-mental state examinations (MMSE) or Koh's block design test in Singaporean elderly subjects than in Japanese ones were suggested to be derived from the difference in the educational systems in the two countries before World War II.³⁷ In blood chemical examinations, total cholesterol and atherogenic index were higher in Singapore than in Japan, although serum total protein and albumin levels were lower in Singaporean elderly than in Japanese ones, this may be due to differences in diet. Although there was no significant difference in mean casual blood sugar level between the two countries, the proportion of subjects with impaired glucose tolerance, defined as casual blood sugar level ≥ 140 mg/dL, was significantly higher in Singaporean subjects than in Japanese ones indicating that the control of diabetes mellitus was not as widespread among community-dwelling elderly in Singapore.

Conclusion

Comparative findings between comprehensive geriatric assessment of community-dwelling elderly in Sing-

apore and in Japan were reported. Between these highly economically developed countries, there were no significant differences in ADLs such as basic, information-related, instrumental and social ones, with the one exception being the intellectual ADL. Japanese elderly people were more highly educated than Singaporean ones, however, a higher QOL and lower prevalence of depression in the community-dwelling elderly population were revealed in Singapore than in Japan. Understanding of the control of chronic risk factors such as hypertension or diabetes mellitus was less widespread among community-dwelling elderly in Singapore than in Japan.

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ORIGINAL ARTICLE

Comprehensive geriatric assessment for community-dwelling elderly in Asia compared with those in Japan: II. Hongchon in Korea

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Background: The objective of the present study is to compare the findings of comprehensive geriatric assessment between community-dwelling elderly people in Korea and in Japan.

Methods: A cross-sectional, interview- and examination-based study was undertaken of community-dwelling elderly people living in a rural district, Hongchon, in Korea and in a rural town, Sonobe, in Kyoto in Japan. Two hundred and thirty-eight community-dwelling elderly people aged 60 years and over in Korea and 411 aged 65 years and over in Kyoto, Japan were examined using a common comprehensive geriatric assessment tool. Interviews concerning activities of daily living (ADL), medical and social history, quality of life (QOL) and the 15-item Geriatric Depression Scale were conducted as well as anthropometric and blood chemical examinations. Findings from the two groups were compared using unpaired *T*-test and χ^2 test.

Results: All examined ADLs except for the social ADL were significantly lower in Korean elderly subjects than in Japanese. Only the mean social ADL score of each group showed no difference. The prevalence of depression assessed by the 15-item Geriatric Depression Scale was higher in Korean elderly subjects than in Japanese. Scores for QOL indices were lower in the Korean subjects than in the Japanese. Korean subjects showed higher mean body mass indices, blood sugar concentrations and prevalences of impaired glucose tolerance than Japanese. Mean age, sex ratio and living situation (living alone or not, etc.) were not significantly different between the two groups.

Conclusion: Comparative features of comprehensive geriatric assessment of community-dwelling elderly between Korea and Japan were reported. Although both are highly economically developed countries in Asia, it was revealed that elderly Korean subjects were in poorer condition with regard to such ADLs as those relating to basic activities,

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information, instrumental and intellectual ones, in comparison with Japanese subjects. The one exception was the social ADL. At the same time, Korean subjects showed a higher prevalence of depression and lower scores for QOL. A high prevalence of impaired glucose tolerance in Korea was noteworthy. We assumed psychosocial rather than biological factors had produced such diversities.

Keywords: ADL, community-dwelling elderly, comprehensive geriatric assessment, depression, QOL.

Introduction

The demographic aging in Japan has been rapidly proceeding at the fastest rate in the world. The time it took for the elderly proportion of the population (65 years old or more) to grow from 7% to 14% was 115 years in France, 85 years in Sweden and 72 years in USA. Whereas it took a mere 25 years in Japan (1963–1997), where the aged population has reached 19% of the whole nation in 2003. In Japan, the central as well as local government appear no longer to be able to bear the exploding social guarantee cost, because public debt in Japan had accumulated up to 151% of GDP (gross domestic product) by 2003. Facing ultra-rapid aging and national bankruptcy, the best means to provide effective and sustainable health care to older persons has become an intense debate. Since 1990, we have carried out community-based comprehensive geriatric surveys of the elderly and have provided the elderly with education for health in several towns in Japan.^{1–11} In those studies, it has been increasingly clear that diseases and frailty in community-dwelling old subjects were greatly influenced by the socioecologic diversities, such as the natural environments, historical background, the lifestyle, habits, religion and health promotion policies in the area.

Now we have applied the common method of comprehensive geriatric assessment to the community-dwelling elderly population living in several countries in Asia and we wish to report the diverse findings compared with those in Japan in a series of articles in this journal.^{12–15}

Korea has rapidly developed into one of the richest countries in Asia, with the 13th largest GDP in the world. However, the speed of demographic aging in Korean society is rather faster than its economic growth. The birth ratio has dropped from 4.54 in 1970 to 1.17 in 2003, falling below that of Japan. At the same time, the life expectancy at birth reached 75.9 years, 72.1 years for men and 79.5 years for women in 2000. Consequently, the Korean elderly population is expected to explode from 7.1% in 2003 to over 14% in 2019, with a faster growth rate than Japan. Although such rapid aging has never been experienced by any human society, Korea does not seem to be fully prepared. In this paper, we

report an internationally comparative comprehensive geriatric assessment between the community-dwelling elderly population living in Korea and in Japan, as a second report of the series drawing up cross-ecological and cross-cultural findings in Asia.

Methods

Subjects

The study population consisted of 238 community-dwelling elderly subjects aged 60 years and more (men : women, 89 : 149; mean age, 72.3 years) living in Hongchon district (Fig. 1) located 130 km east of Seoul City in Korea and 411 subjects aged 65 years and older (men : women, 174 : 237, mean age, 71.7 years) living in Sonobe town in Kyoto prefecture in Japan. The community-based geriatric surveys of elderly people living in Korea and Japan were carried out during April 2004 and October 2003, respectively.

Two hundred and thirty-eight subjects in Korea consisted of 119 people (48 men and 71 women) in Dong-Myeon and 119 people (41 men and 78 women) in Seoseok-Myeon in Hongcheon in Kangwondo. Dong-Myeon has a population of 4034 with 1216 people aged 60 (and 872 aged 65) years or more and Seoseok-Myeon has a population of 4478 with 1120 aged 60 (and 749 aged 65) years or more while Sonobe

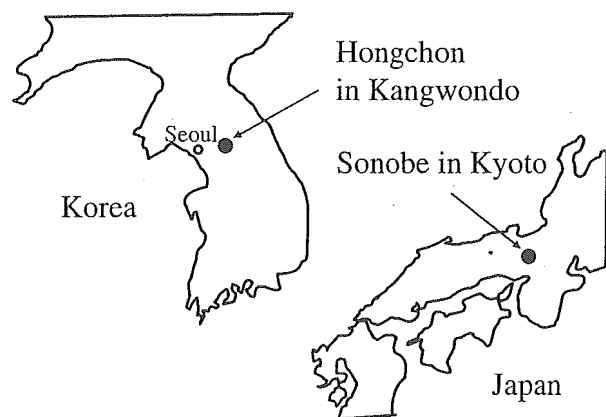


Figure 1 Map of the field area.

town, in Japan, has a population of 16 700 with 3340 people aged 65 years or more.

Items of comprehensive geriatric assessment

The comprehensive geriatric assessment (CGA) 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 (on a scale of 3 to 0) with regard to seven activities (walking, ascending and descending stairs, feeding, dressing, making his/her toilet, bathing, grooming) as to the help needed. The scores corresponded to the following assessments: 3, completely independent; 2, need some help; 1, need help much; 0, completely dependent. The items were added to give scores ranging from 0 to 21, with low scores indicating disability.^{1,6,10,16} Subjects' information-related functioning was assessed by summing the scores for five functional abilities (visual acuity, hearing acuity, conversation, memory in one day and use telephone) using a rating scale from 0 (cannot function at all) to 3 (completely independent) into a score of 0–15. For higher-level functional capacity, each subject rated his/her independence in the Tokyo Metropolitan Institute of Gerontology (TMIG) index of competence.^{17,18} This assessment consists of a 13-item index including three sublevels of competence: (i) instrumental ADLs (five items, including the ability to use public transport, buy daily necessities, prepare a meal, pay bills, handle banking matters; all rated on a yes/no basis); (ii) intellectual ADLs (four items, including the ability to fill in forms, read newspapers, read books or magazines and interest in television programs or news articles on health-related matters; all rated on a yes/no basis); and (iii) social ADLs (four items, including the ability to visit friends, give advice to relatives and friends who confide, visit someone in hospital and initiate conversation with younger people; all rated on a yes/no basis).

Depression and quality of life

We screened for depressive symptoms using the Japanese version of the 15 item-Geriatric Depression Scale (GDS-15)^{19,20} orally translated by native interpreters into Korean for the Korean elderly subjects. 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'. Quality of life was 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.^{21,22}

Social, anthropometrical and medical assessments

Living conditions, lifestyle (current exercise, drinking alcohol, smoking and so on), and medical histories (histories of stroke, heart diseases and osteoarthropathies, as well as taking antihypertensive drugs) were also assessed. Two blood pressure measurements in the sitting position by auto-sphygmomanometer (HEM 757, Omron, Japan) were averaged to determine the blood pressure of each subject.

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 Korea and in Japan. The mean ages of the two groups were not significantly different. Nor was there any difference in lifestyle such as rates of subjects living alone, drinking alcohol or smoking. But working or doing exercise every day was more common in Japanese elderly than in Korean one. The rate of having antihypertensive medication showed no difference between the groups. The proportion of subjects recognizing their apparent history of stroke (brain attack) and osteoarthropathy were higher in Korea than in Japan. While the history of heart disease was more prevalent in Japan. Past history of falls (syncope, etc.) was relatively rare both in Korea and in Japan (18.4% and 12.4%, respectively).

Table 2 shows the comparison of scores in ADLs, GDS-15 score and quantitative QOLs between community-dwelling elderly living in Korea and those in Japan. The basic ADL scores of the Japanese were slightly, but significantly, higher than those of the Koreans. The scores for information-related, instrumental and intellectual ADL were apparently higher in Japanese subjects than in Korean. There was no significant difference in the scores for social ADL. All in all, scores of TMIG were higher in Japan than in Korea. Ratios of samples who got full marks are higher in Japan than in Korea in all ADL scales. The mean scores for GDS-15 and a prevalence of depression, including both mild (GDS \geq 6) and severe (GDS \geq 10), were significantly higher in Korean elderly subjects than in Japanese ones. In particular the proportion of severe

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

	Hongchon in Korea (<i>n</i> = 238)	Kyoto in Japan (<i>n</i> = 411)	<i>P</i>
Mean age	72.3 ± 6.1	71.7 ± 4.8	NS
Male : female	89 : 149	174 : 237	NS
Marital state			NS
Widowed (%)	27.3	18.8	
Unmarried (%)	0	0.2	
Divorced (%)	0.9	0.7	
Lifestyle factors			
Living alone (%)	11.4	7.5	NS
Drinking alcohol (%)	37.6	48.6	0.007
Current smoking (%)	10.9	13.9	NS
Work or do exercise every day (%)	67.1	81.4	< 0.0001
Medical			
Taking anti-hypertensive medication (%)	32.8	34.4	NS
History of stroke (%)	8.3	4.0	0.0008
History of heart disease (%)	10.9	21.2	< 0.0001
History of osteoarthopathy (%)	81.2	59.4	< 0.0001
History of fall in the last year (%)	18.4	12.8	NS

NS, not significant.

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

	Hongchon in Korea	Kyoto in Japan	<i>P</i>
Activities of daily living			
Scores of basic ADL (0–21)	20.4 ± 0.9	20.8 ± 0.7	< 0.0001
Independence of basic ADL, %	62	89.2	< 0.0001
Information-related function (0–15)	13.4 ± 1.5	14.7 ± 0.8	< 0.0001
Independence of Information-related function, %	27.9	81	< 0.0001
Scores of instrumental ADL (0–5)	4.4 ± 1.1	4.9 ± 0.5	< 0.0001
Independence of instrumental ADL, %	30.3	69.8	< 0.0001
Scores of intellectual ADL (0–4)	1.9 ± 1.3	3.7 ± 0.6	< 0.0001
Independence of intellectual ADL, %	16.2	80.2	< 0.0001
Scores of social role (0–4)	3.3 ± 1.1	3.5 ± 1.0	0.013
Independence of social ADL, %	57.2	69.2	0.0025
Scores of TMIG (0–13)	9.5 ± 2.6	12.1 ± 1.6	< 0.0001
Independence of TMIG, %	12.6	58.4	< 0.0001
Depression			
Geriatric depression scale scores (0–15)	5.4 ± 4.2	3.4 ± 3.2	< 0.0001
Geriatric depression scale scores ≥ 6	39.7	22.7	< 0.0001
Geriatric depression scale scores ≥ 10	20.5	5.1	< 0.0001
Quality of life scores (0–100)			
Subjective health	49.4 ± 29.4	67.2 ± 17.8	< 0.0001
Family relationship	81.5 ± 20.2	81.5 ± 16.9	NS
Friend relationship	77.5 ± 22.4	79.8 ± 16.7	NS
Financial satisfaction	58.2 ± 28.2	64.0 ± 21.5	0.004
Subjective happiness	67.4 ± 25.3	73.2 ± 17.6	0.001

NS, not significant; TMIG, Tokyo Metropolitan Institute of Gerontology index of competence.

depression was exceptionally high (20.5%) in Korean subjects. The Korean elderly had significantly lower scores in QOL measurements of their subjective sense of health, financial satisfaction and happiness than the Japanese.

Table 3 shows the comparison of anthropometrical indicators between two elderly groups. Body mass index and diastolic blood pressure were higher in Korean elderly than in the Japanese. The prevalence of hypertension, defined as systolic pressure > 140 mmHg or diastolic pressure > 90 mmHg based on the measurements of casual blood pressure, did not differ between the groups.

Table 4 shows the comparison of blood chemical findings between two elderly groups. Japanese subjects showed higher blood concentrations of total cholesterol, HDL-cholesterol, creatinine, hemoglobin, and uric acid than the Koreans, but these levels were not pathologically high. Blood sugar levels, prevalence of impaired glucose tolerance and atherogenic indices were higher in Korean than in Japanese subjects.

Discussion

Several studies have shown the importance of comprehensive geriatric assessment for the elderly in the geriatric medical field.^{23,24} Since 1990, we have introduced the comprehensive geriatric assessment into community-dwelling elderly people in several Japanese towns to find some diverse features.²⁵ Human aging phenomena and the nature of diseases are modified by or, in some cases, defined by differences in natural ecology,^{26,27} and the social sense of value or human culture.²⁸⁻³⁰ However, cross-cultural or cross-ecologic studies based on comprehensive assessments of the elderly have been limited to organ- or disease-specific areas.³¹ In order to untangle the multiple aspects of health and disease, we applied the common method of comprehensive geriatric assessment to community-dwelling elderly populations living in different countries in Asia including Japan.

As described above, Korea has successfully developed since its independence in 1948 and has grown into the 13th largest economic power in the world. Its economic growth rate in recent years remains higher than that of

Table 3 Comparison of anthropometric indicators and neurobehavioral functions between the community-dwelling elderly in Korea and those in Japan

	Hongchon in Korea	Kyoto in Japan	P
Anthropometric			
Height (cm)	152.9 ± 8.7	154.2 ± 8.6	NS
Weight (kg)	56.7 ± 9.5	53.9 ± 8.7	0.0001
Body mass index (BMI)	24.2 ± 3	22.6 ± 2.7	< 0.0001
Blood pressure			
Systolic blood pressure (mmHg)	137.5 ± 21.8	140.6 ± 20.3	NS
Diastolic blood pressure (mmHg)	83.5 ± 11.5	78.3 ± 10.6	< 0.0001
Prevalence of hypertension (%; SBP > 140 or DBP > 90)	44.3	48.7	NS

NS, not significant.

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

	Hongchon in Korea	Kyoto in Japan	P
Total cholesterol (mg/dL)	166.1 ± 34.0	209.5 ± 35.0	< 0.0001
HDL-cholesterol (mg/dL)	44.8 ± 10.8	65.8 ± 17.5	< 0.0001
Atherogenic index	2.9 ± 1.1	2.4 ± 0.9	< 0.0001
creatinine (mg/dL)	0.83 ± 0.26	0.89 ± 0.19	0.0004
Blood sugar (mg/dL)	123.0 ± 41.7	99.3 ± 21.1	< 0.0001
Impaired glucose tolerance (BS ≥ 140 mg/dL, %)	15.8	4.4	< 0.0001
Hemoglobin (g/dL)	11.5 ± 1.2	13.6 ± 1.4	< 0.0001
Uric acid (mg/dL)	4.3 ± 1.5	5.0 ± 1.3	< 0.0001
GOT (IU/L)	23.8 ± 17.9	25.5 ± 16.2	NS
GPT (IU/L)	19.4 ± 11.6	20.8 ± 22.3	NS

NS, not significant.

Japan in spite of severe damage from the Asian currency crisis in 1997. The gross domestic income per capita amounted to US\$8910 in 2002. Although the gross domestic product per capita in Korea remains one-quarter of that of Japan, the average buying power per capita for the Korean population is equivalent to 70% of the Japanese figure. Moreover, according to a CIA report from 2000–2001,³² the disparity between rich and poor in Korea is not large compared to the world average. Comparative JINI coefficients (indicator of economic disparity) are: Korea, 32%; Japan, 25%; China, 40%; the US, 40.5%; and the world 2002 average is 76%. In addition, the Korean government has established universal public health insurance, a medical aid policy for poor and aged, unemployment insurance and a national pension policy, all of which have provided basic cover for all Korean citizens since 1988. Now, the Korean central government is responsible for free nation-wide health care funded by taxes. In short, Korea today is undoubtedly a rich and equal society comparable to Japan.³²

However, our study found Korean elderly subjects to be in rather poor condition with regard to ADL, QOL and psychiatric health (depression). In particular, their GDS (Geriatric Depression Scale) scores were the highest of all elderly people we surveyed in various countries or communities, including Indonesia, Vietnam and Lao PDR.

Could Korean subjects be among the most depressive elderly people in the world? Before saying so, of course, there remain a lot of questions to be asked about the results. First of all, we should consider possible methodological biases. Our survey was based largely on questionnaires established in Japan or the USA, and the Korean version of them were not fully validated. Our methods were somewhat too immature to obtain fully reliable results. However, in this study, all interviews with the elderly were conducted by Korean graduate students who could speak Japanese as well as Korean, under close consultation with us. So, there is at least little room for serious misunderstandings in regard to interpretation. Besides, we had already conducted a preliminary study of the elderly of Korea in 2002 with almost the identical results.

It was more likely that our subjects were not truly representative of the Korean elderly population. Hongchon district, where this survey was conducted, is a remote, depopulated mountainous area. The great majority of elderly subjects who kindly participated in our survey were farmers, virtually illiterate with very little education. Considering that 70% of the population in Korea is urban and 70% work in service occupations, our subjects might be an atypical elderly group in Korea.

However there has been a nation-wide survey investigating the prevalence of depressive symptoms in the elderly in Korea.³³ It found a surprisingly high

prevalence of 25.4% using a cut-off score of 16/17 in Center of Epidemiologic Study of Depression (CES-D)^{33,34}. Another community-based survey reported a prevalence of a wish to die in the elderly of 14.6% within the last 2 weeks.³⁴ Many other studies have repeatedly revealed a high prevalence of depression in the Korean elderly population.^{35,36} Moreover, one study showed no difference in the prevalence of depression between urban and rural elderly populations in Korea, using a Korean version of the GDS.³⁶ On the other hand, according to The Cross-National Collaborative Group, the lifetime rates for developing depression (not the prevalence in the aged population) in Korea were estimated at only 2.3%, which is very low in contrast to 5.2% in the USA, 15.4% in Paris France or 9.2% in West Germany.³⁷

Although there has been controversy about the prevalence of depression in the elderly in Korea, a large proportion of recent studies support the finding of a high prevalence. Yoon *et al.* tried to validate GDS-15 (including 15 items, the same as we used in this study), creating the Korean version of GDS (KGDS, 10 items) in 2003.³⁸ Yoon showed that the KGDS was as valid as the original GDS, but didn't prove the validity of GDS itself when it applied to Korean elderly. In his study,³⁸ 269 Korean elderly subjects (mean age, 70.27 years; SD, 9.8) were screened by GDS and a mean score of 6.21 (SD 3.90) was obtained. These results indicated that half of the elderly sample would be diagnosed with probable depression based on GDS (GDS \geq 6). Although a lot of cross-cultural studies have confirmed 6–7 as an appropriate GDS cut-off point for a diagnosis of probable depression, Yoon found a risk of over-diagnosis when GDS was simply applied to Korean elderly. He said Korean culture or customs would make the elderly more likely to provide depressive-like answers. But he also indicated that the prevalence of depression, in fact, was high in the Korean elderly population compared with the world average. If depression was exceptionally prevalent in Korean elderly, it would be natural that their ADL and QOL deteriorated. Decreases in QOL and high-performance ADLs (information, instrumental etc.) are known to show a good correlation with severity of depression.³⁹

Of course the ultimate cause of the high prevalence of depression in Korean elderly (or low prevalence of depression in other countries) is unknown. Mere economic factors could hardly explain this phenomenon because, as previously mentioned, Korea has become a relatively rich and equal society. There could be some biochemical, genetic, nutritional or climatic influences that promote depression. The Korean biological and natural environment, however, does not seem to be unique, being quite similar to the Japanese, so the main depressogenic factors in Korean elderly would seem to be psycho-social. The history of the Korean

peninsula since 1955 has shown that two groups of people with identical backgrounds could diverge dramatically. Yoon suggested that excessively rapid modernization and urbanization of Korean society had put burdens on the elderly, such as isolation, collapse of the old value system etc. The elderly in Korea had to endure a lot of hardships, such as Japanese colonization, World War II, the Korean war, a divided nation and so on.

However, rapid modernization is a common feature of many Asian countries, including Japan. and severe experiences in the history like colonization or war are also shared by many Asian societies. We examined about 400 Vietnamese elderly people living in the community in November 2003. and found a relatively low prevalence of depression, about one-quarter of that of elderly Koreans.¹⁴ The majority of Vietnamese elderly subjects had experienced French or Japanese colonization, World War II, the war against France, the 'Vietnam war', war against China and Cambodia, and then very rapid modernization. Vietnamese annual income per capita amounted to US\$390 in 2002, with far poorer medical and welfare systems than Korea. Finally, again, we couldn't figure out what had actually happened to the elderly living in Hongchon in Korea.

The proportion of subjects who have a history of stroke was higher in Korea (8.3%) than in Japan (4.0%) (Table 1) and to eliminate this bias we also analyzed only the subjects who had no history of stroke. In this analysis all results (Tables 2–4) remained almost the same except for the average of systolic blood pressure, which was significantly lower in Korea (136.7 ± 22.0) than in Japan (140.5 ± 20.2) ($P = 0.02$) but prevalence of hypertension remained the same.

We have discussed the problem in the screening of depression in the cross-cultural study. In the evaluation of other CGA and ADL we should also consider the effects of the diversity of cultures. Especially in the evaluation of higher functional ADL, the importance and value of indices for assessing the levels of functional capacity differ according to cultural differences. Though there may be some bias by the effect of cultural difference, there were apparent differences in lifestyle, ADL, depression, subjective QOL and blood chemical examination between two areas in Korea and Japan. This is noteworthy and further examination of CGA is called for in order to promote functional capacity and QOL in the elderly. Moreover, as outlined above, because Korea is now a considerably modernized society like Japan, higher functional ADL measurements we used here might create little cultural biases in comparison between Korean and Japanese subjects. More frequently, any higher functional assessments cannot eliminate cultural biases, because 'human higher function' itself must include skills relating to social or cultural adaptation. For example, there have not been any

intelligence quotient (IQ) tests that are free from any cultural background.

This comprehensive assessment of community-dwelling elderly people in Korea has revealed a unique profile that is currently difficult to explain. Further investigation will shed new light on the nature of the elderly in terms of biology, psychology, sociology, history and so on.

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ORIGINAL ARTICLE

Comprehensive geriatric assessment for community-dwelling elderly in Asia compared with those in Japan: III. Phuto in Vietnam

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Background: The objective of the present study is to compare the findings of comprehensive geriatric assessment between community-dwelling elderly aged 60 years and older living in Vietnam and in Japan.

Methods: A cross-sectional, interview- and examination-based study was undertaken of community-dwelling elderly people living in under-developed Ngoc Quan village, semi-developed Viet-tri city in Phuto province, both in Vietnam and in Sonobe town in Kyoto, Japan. One hundred and ninety-nine and 188 community-dwelling elderly aged 60 years or older in two developmentally different areas in Vietnam and 411 community-dwelling elderly aged 65 years or older in Japan, were examined using a common comprehensive geriatric assessment tool. Interviews 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 anthropometrical and blood chemical examinations were included in the assessment. Using ANOVA and χ^2 test, findings from the three groups were compared.

Results: In a comparison of comprehensive geriatric assessment findings among community-dwelling elderly in under-developed Ngoc Quan village, in semideveloped Viet-tri city in Vietnam and in highly developed Kyoto in Japan, all activities of daily living scores except those relating to social role, all quality of life scores, body mass index, serum lipid levels and hemoglobin concentrations were lowest in Ngoc Quan and highest in Kyoto. Mean blood pressure measurements, prevalence of hypertension and prevalence of impaired glucose tolerance were higher in Vietnam than in Japan. The prevalence of depression was lower in the elderly in Viet-tri in Vietnam than those in Ngoc Quan in Vietnam or in Kyoto in Japan.

Conclusion: It is supposed that economic and social development might bring higher comprehensive geriatric assessment scores, better-nutritional states and more appropriate

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controls for risk factors in community-dwelling elderly in a economically developmental dose responsive manner.

Keywords: ADL, community-dwelling elderly, comprehensive geriatric assessment, QOL, Vietnam.

Introduction

Asian countries have diverse characteristics in geographic ecology, population and ethnicity, histories and cultural backgrounds and economical and industrial development. However, the aging population is now rapidly growing in each country in Asia. This fourth paper in a series of articles dealing with the comparison of comprehensive geriatric assessments of community-dwelling elderly in Asian countries in comparison with those in Japan addressed the elderly people in Vietnam.

Vietnam is known to be a poor, but now successfully developing, country in South-East Asia. Vietnam is located 3600 km from Japan and its total population is 81 624 716 people (July 2003), consisting of about 60 ethnic groups. The proportion of the population aged 65 years and older is 5.6% in 2003. Life expectancy at birth in Vietnam is 67.6 years in men and 72.7 years in women in 2003. The people are mostly ethnic Vietnamese (85–90%) and other ethnic groups; Chinese, Hmong, Thai, Khmer, Cham etc.¹

Now we have applied the common method of comprehensive geriatric assessment (CGA) to the community-dwelling elderly population living in two areas in Phuto province in Vietnam compared with the CGA findings of community-dwelling elderly in Kyoto in Japan.

Methods

Subjects

The study population consisted of 199 community-dwelling elderly subjects aged 60 years and older (male : female, 81 : 118; mean age, 71.2 years) living in a under-developed rural village, Ngoc Quan, and 188 ones (male : female, 94 : 94; mean age, 70.3 years) living in a semideveloped city, Viet-tri, in Doan Hung district in Phuto province which is located 80 km north-west of the capital, Hanoi City, in Vietnam (Fig. 1). Almost all of the elderly subjects in Ngoc Quan were non-intellectual retired farmers, while most of the elderly subjects in Viet-tri city were intellectual retired government employees. The comparative control subjects consisted of 411 community-dwelling elderly (male : female, 174 : 237; mean age, 71.7 years) living in Sonobe town in Kyoto in Japan. The geriatric surveys of community-dwelling elderly living in Vietnam and in Japan were carried out in April and November 2003, respectively.

The Ngoc Quan village in Doan Hung district had a population of 3975 people and 799 elderly (60 years old or older; male : female, 322 : 477) and we examined 199 elderly (24.9% of eligible subjects). Viet-tri city in Doan Hung district had a population of 15 960 people and 973 elderly (60 years old or older; male : female, 482 : 491) and we examined 188 elderly (19.3% of eligible subjects). Sonobe town in Kyoto had the population of 16 700 and 3340 elderly (65 years or older) and we examined 411 elderly (12.3% of eligible subjects).

Items of comprehensive geriatric assessment

Items on the CGA included activities of daily living (ADL), screening of depression and quantitative



Figure 1 Map of Ngoc Quan and Viet-tri in Phuto province Vietnam.

assessment of quality of life (QOL), as well as medical and anthropometrical indicators. We tried to translate the assessment sheet from English to Vietnamese and to counter-translate from Vietnamese to English to get the most appropriate expression for the Vietnamese questionnaire.

Activities of daily living

For the basic ADL assessment, each subject rated his/her independency in regard to seven activities (walking, ascending and descending stairs, feeding, dressing, making his/her toilet, bathing, grooming) as to the help needed. Ratings were from 3 to 0, with 3 indicating that the subject was completely independent; 2 indicating that the subject needs some help; 1 indicating that the subject needs much help; and 0 indicating that the subject is completely dependent). The items were added to give scores ranging from 0 to 21, with low scores indicating disability.²⁻⁵ Information-related functioning was measured using a scoring system. We summed the scores for four functions (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 total score between 0 and 12. For higher-level functional capacity, each subject rated his/her independence in the Tokyo Metropolitan Institute of Gerontology (TMIG) index of competence.^{6,7} 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, handle banking matters, rated on a yes/no basis); (ii) intellectual ADLs (four items; the ability to fill in forms, read newspapers, read books or magazines and subjects' levels of 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 in hospital and initiate conversation with younger people, rated on a yes/no basis).

Depression and quality of life scores

We screened for depressive symptoms using the English version translated into Vietnamese of the 15-item Geriatric Depression Scale (GDS-15).^{8,9} 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) in the following five items; subjective sense of health, relationships with family, relationships with friends, financial status and subjective happiness.^{10,11}

Social, anthropometrical and medical assessments

Living conditions, lifestyle (current exercise, drinking alcohol, smoking and so on), and medical histories (histories of stroke, heart diseases and osteoarthropathy, as well as taking antihypertensive drugs) were also assessed. Two blood pressure measurements in a sitting position, taken by auto-sphygmomanometer (HEM 757, Omron, Japan), were averaged to produce the pressure levels of the subjects and blood chemical analysis (total cholesterol, HDL-cholesterol, creatinine, blood sugar, hemoglobin, uric acid) were performed by auto-blood chemical analyzer (SP-4410, 4420, Arkrey, Japan).

Statistical analysis

Statistical analysis was performed using Stat View ver.5 for Macintosh (SAS institute, Inc., Cary, NC). The analysis of variance (ANOVA) 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 among the elderly subjects living in Ngoc Quan and Viet-tri in Vietnam and in Sonobe, Kyoto in Japan. There was no significant difference in mean age among the elderly subjects in Ngoc Quan, Viet-tri in Vietnam and Kyoto in Japan. The percentage of widowed subjects was significantly higher in Ngoc Quan (33.8%) than in Viet-tri (21.8%) or Kyoto (18.8%). The percentage of elderly living alone in Viet-tri (4.2%) was lower than in Ngoc Quan (8%) or Kyoto (7.5%). The percentage of elderly drinking alcohol was higher in Kyoto (22%) than in Ngoc Quan (11.6%) or Viet-tri (12.8%). The percentage of the elderly who smoke was lower in Ngoc Quan (11.1%) than in Viet-tri (14.4%) or Kyoto (13.9%). The percentage of elderly who worked or did exercise every day was higher in Viet-tri (86.2%) than in Ngoc Quan (83.9%) or Kyoto (81.4%). The rate of elderly subjects taking anti-hypertensive medication was higher in Kyoto (34.4%) than in Ngoc Quan (11.1%) or Viet-tri (20.9%). The rate of subjects recognizing their apparent history of stroke was higher in Ngoc Quan (7.6%) than in Kyoto (3.9%) or Viet-tri (3.1%). The rate of subjects recognizing their apparent history of heart disease was higher in Kyoto (21.2%) than in Ngoc Quan (17.2%) or Viet-tri (15%). Past history of osteoarthropathy was lower in Ngoc Quan (47.7%) than in Viet-tri (55.9%) or Kyoto (59.4%). The past history of falls was higher in Ngoc Quan (27.5%) than in Viet-tri (15.7%) or Kyoto (12.9%).

Table 2 shows the comparison of scores in ADL, GDS-15 scores and quantitative QOL scores among

Table 1 Baseline characteristics of community-dwelling elderly in Vietnam and in Japan

	Ngoc Quan, Vietnam (<i>N</i> = 199)	Viet-tri, Vietnam (<i>N</i> = 188)	Sonobe, Kyoto, Japan (<i>N</i> = 411)	ANOVA
Mean age	71.2 ± 9.0	70.3 ± 7.0	71.7 ± 4.8	NS
Male : female	81 : 118	94 : 94	174 : 237	NS
Marital status (%)				0.002
Widowed	33.8	21.8	18.8	
Unmarried	0	1.1	0.2	
Divorced	1	0.5	0.7	
Lifestyle (%)				
Living alone	8	4.2	7.5	0.0175
Drinking alcohol	11.6	12.8	22	0.0009
Smoking	11.1	14.4	13.9	0.0009
Work or do exercise every day	83.9	86.2	81.4	< 0.0001
Medical (%)				
Taking anti-hypertensive medication	11.1	20.9	34.4	< 0.0001
History of stroke	7.6	3.1	3.9	< 0.0001
History of heart disease	17.2	15	21.2	< 0.0001
History of osteoarthopathy	47.7	55.9	59.4	< 0.0001
History of fall	27.5	15.7	12.9	0.0013

NS, not significant.

Table 2 Comparison of activity of daily living (ADL) and quality of life (QOL) scores between community-dwelling elderly in Vietnam and in Japan

	Ngoc Quan in Vietnam (<i>N</i> = 199)	Viet-tri in Vietnam (<i>N</i> = 188)	Kyoto in Japan (<i>N</i> = 411)	<i>P</i>
ADL				
Scores of basic ADL (0–21)	19.9 ± 2.2	20.1 ± 1.9	20.8 ± 0.7 ^{†§}	< 0.0001
Independence of basic ADL (%)	55.8	53.2	89.2	< 0.0001
Information-related function	9.7 ± 1.6	10.2 ± 1.4 [‡]	11.7 ± 0.7 ^{†§}	< 0.0001
Independence of information-related function (%)	17.3	20.7	80.9	< 0.0001
Scores of instrumental ADL (0–5)	3.5 ± 1.7	4.1 ± 1.4 [‡]	4.8 ± 0.5 ^{†§}	< 0.0001
Independence of instrumental ADL (%)	43.7	61.2	92.6	< 0.0001
Scores of intellectual ADL (0–4)	2.3 ± 1.6	3.0 ± 1.5 [‡]	3.7 ± 0.6 ^{†§}	< 0.0001
Independence of intellectual ADL (%)	45.2	66	80.2	< 0.0001
Scores of social role (0–4)	3.5 ± 0.9	3.7 ± 0.8 [‡]	3.5 ± 1.0 [§]	0.0026
Independence of social ADL (%)	65.8	84.0	69.2	< 0.0001
Scores of TMIG (0–13)	9.3 ± 3.8	10.8 ± 3.3 [‡]	12.1 ± 1.6 ^{†§}	< 0.0001
Independence of TMIG (%)	34.2	56.9	58.4	< 0.0001
Depression				
Scores of geriatric depression scale (GDS)	4.2 ± 2.9	2.6 ± 2.1 [‡]	3.4 ± 3.2 ^{†§}	< 0.0001
% of GDS ≥ 6	23.2	10.6	22.7	0.0012
% of GDS ≥ 10	7.6	0.5	5.1	0.0036
QOL				
Subjective health	44.0 ± 19.6	50.7 ± 15.6 [‡]	67.4 ± 17.7 ^{†§}	< 0.0001
Family relationship	75.9 ± 20.2	76.7 ± 16.2	81.7 ± 16.8 ^{†§}	0.0001
Friend relationship	78.6 ± 17.1	77.9 ± 16.5	79.8 ± 16.6	NS
Financial satisfaction	50.4 ± 17.2	52.0 ± 11.9	64.5 ± 21.2 ^{†§}	< 0.0001
Subjective happiness	57.8 ± 19.2	60.9 ± 16.2	73.5 ± 17.2 ^{†§}	< 0.0001

[†]Ngoc Quan vs Kyoto; [‡]Ngoc Quan vs Viet-tri; [§]Kyoto vs Viet-tri.

Table 3 Comparison of anthropometrical indicators and neurobehavioral functions of between community-dwelling elderly in Vietnam and in Japan

	Ngoc Quan in Vietnam (N = 195)	Viet-tri in Vietnam (N = 188)	Kyoto in Japan (N = 411)	P
Anthropometrical				
Height	151.2 ± 8.5	153.4 ± 8.8 [‡]	154.2 ± 8.6 [†]	0.0003
Weight	43.8 ± 8.4	47.6 ± 9.6 [‡]	53.9 ± 8.7 ^{†§}	< 0.0001
Body mass index (BMI)	19.1 ± 2.9	20.1 ± 3.1 [‡]	22.6 ± 2.7 ^{†§}	< 0.0001
Blood pressure				
Systolic blood pressure (mmHg)	145 ± 28 [†]	150 ± 27 [§]	141 ± 20	0.0001
Diastolic blood pressure (mmHg)	87 ± 15 [†]	90 ± 15 [§]	78 ± 11	< 0.0001
Prevalence of hypertension, SBP > 140 or DBP > 90 (%)	54.7	62.8	48.7	0.0002

[†]Ngoc Quan vs Kyoto; [‡]Ngoc Quan vs Viet-tri; [§]Kyoto vs Viet-tri.

community-dwelling elderly living in two areas in Vietnam and ozone location in Japan. There were significant differences in scores for basic ADL, information-related function, instrumental ADL, intellectual ADL, social roles and TMIG index. The mean scores of all of ADLs except social role were significantly higher in Japanese elderly followed by subjects in Viet-tri, and those of subjects in Ngoc Quan were lowest. However, the mean score for social role was significantly higher in Viet-tri than in Ngoc Quan or Kyoto. The mean score of GDS-15 and the prevalence of depression, including both mild (GDS ≥ 6) and severe (GDS ≥ 10), in elderly subjects in Viet-tri were significantly lower than those in Ngoc Quan or Kyoto. Scores in the QOL items of subjective sense of health, family relationship, financial satisfaction and subjective happiness were higher in Japanese elderly subjects than in Vietnamese ones.

Table 3 shows the comparison of anthropometric indicators among the three elderly groups. Body mass index was significantly highest in the elderly subjects in Kyoto followed by those in Viet-tri and then Ngoc Quan. Blood pressure, both systolic and diastolic, was significantly highest in elderly subjects in Viet-tri, followed by those in Ngoc Quan and in 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 also highest in Viet-tri (62.8%), followed by the prevalence in Ngoc Quan (54.7%) and that in Kyoto (48.7%).

Table 4 shows the comparison of blood chemical findings among the three elderly groups. Both levels of serum total cholesterol and HDL-cholesterol were higher in Japanese subjects than Vietnamese. Blood sugar levels and renal functional indicators were higher in Vietnamese elderly than in Japanese. Hemoglobin concentration was highest in the Japanese elderly,

followed by subjects in Viet-tri and those in Ngoc Quan. According to the WHO criteria of anemia (men, Hb < 13 g/dL; women, Hb < 12 g/dL), the percentage of anemia in the elderly in Ngoc Quan (70.8%) and Viet-tri (58.5%) were dramatically higher than those in Kyoto (11.9%).

Discussion

Scores in all ADL items except social role and scores in quantitative QOL except relationships with friends were higher in Japanese elderly subjects than in Vietnamese. In particular, the ratios of independent basic, instrumental and intellectual ADLs were lower in Vietnamese elderly subjects than in Japanese ones possibly due to historically less-developed medical and educational systems and under-developed infrastructure. The apparent rates of recognized past medical histories such as hypertension, heart disease and osteoarthritis were higher in Japan than in Vietnam possibly due to differences in the development and availability of health services between the two countries. However, it is noteworthy that the prevalence of depression in the elderly was lower in Viet-tri in Vietnam than in Ngoc Quan in Vietnam or in Japan. We were impressed that the history of Vietnam told by the intellectual older citizens in Viet-tri involved three key words regarding Vietnam: 'ethnic', 'war', and 'independence'. Historically speaking, the Vietnamese have experienced many wars during the past 5000 years; against China, France, Japan and USA from 2880 B.C. to 1973 A.D. They declared independence after World War II but the French continued to rule until 1954 when they were defeated by communist forces under Ho Chi Minh, who took control of the north. US economic and military aid to South Vietnam grew through the 1960s in an attempt to bolster the government, but US armed forces were withdrawn

Table 4 Comparison of blood chemical findings between community-dwelling elderly in Vietnam and in Japan

	Ngoc Quan in Vietnam (N = 186)	Viet-tri in Vietnam (N = 186)	Kyoto in Japan (N = 411)	P
Total cholesterol (mg/dL)	160 ± 30	180 ± 38 [#]	210 ± 35 ^{†§}	< 0.0001
HDL-cholesterol (mg/dL)	37 ± 11	40 ± 11	66 ± 18 ^{†§}	< 0.0001
Creatinine (mg/dL)	1.0 ± 0.2	1.1 ± 0.2 [#]	0.9 ± 0.2 ^{†§}	< 0.0001
Blood glucose (mg/dL)	105 ± 20	104 ± 35	99 ± 21 ^{†§}	0.0147
% Impaired glucose tolerance (BS ≥ 140)	5.5	4.3	4.4	< 0.0001
Hemoglobin (g/dL)	11.4 ± 1.4	12.2 ± 1.2 [#]	13.6 ± 1.4 ^{†§}	< 0.0001
% of Anemia (male, Hb < 13 g/dL; female: Hb < 12 g/dL)	70.8	58.5	11.9	< 0.0001

[†]Ngoc Quan vs Kyoto; [#]Ngoc Quan vs Viet-tri; [§]Kyoto vs Viet-tri.

following a cease-fire agreement in 1973, after North Vietnamese forces over-ran the south. Vietnam became a unified nation in 1975. Economically, Vietnam has had to recover from the ravages of war and the loss of financial support from the former Soviet Union. Substantial progress was achieved from 1986 to 1996. Therefore the 1997 Asian financial crisis highlighted the problems in Vietnamese economy, Vietnamese authorities have moved to implement the structural reforms needed to modernize the economy. The intellectual older people living in Viet-tri appeared to have achieved a kind of dignity resulting from the glory of the wars and new challenges presented by further political and economic progress for their country. Vietnam's GDP per capita is increasing by \$US2300 (the 10th greatest of all South-East Asian countries) and 7.3% of GDP. A lower prevalence of depression in the intellectual elderly in Viet-tri city was supposed to be associated with this economical development and a challenging new era.

Vietnamese elderly people had lower BMIs than the Japanese, this is probably due to poverty and the relatively undeveloped lifestyle in Vietnam. Mean blood pressure measurements and the prevalence of hypertension were higher in Vietnamese elderly subjects than in Japanese ones because of a lower rate of treatment of hypertensive elderly in Vietnam like in Indonesia.¹² In blood chemical examinations, the mean level of total cholesterol, HDL-cholesterol and hemoglobin concentration were significantly lower in Vietnamese elderly subjects than Japanese ones. There was a significant difference in mean casual blood sugar levels between the two countries, the rate of subjects with impaired glucose tolerance, defined as casual blood sugar level ≥ 140 mg/dL, was significantly higher in Vietnamese subjects than in Japanese ones, indicating that control of diabetes mellitus was less widespread among community-dwelling elderly in Vietnam and that the lifestyle includes a high-carbohydrate diet as in Lao PDR.¹³

Also of particular note is the comparative CGA findings among elderly in under-developed rural Ngoc Quan, in semideveloped Viet-tri city and in highly developed Kyoto in Japan. Almost all the elderly subjects in Ngoc Quan were retired farmers, who had relatively low incomes (average \$US22.4 per month), while most of the elderly subjects in Viet-tri city were retired government employees, who had relatively high incomes (average \$US38.5 US per month). On the other hand, the elderly subjects in Kyoto were retired farmers, who had relatively very much higher incomes (average \$US1336 per month).¹⁴ The CGA findings in the elderly in semideveloped Viet-tri city lay between those in under-developed Ngoc Quan and those in highly developed Kyoto in scores in ADLs except social role, body mass index, serum lipid levels, hemoglobin concentrations and prevalence of anemia as defined by the WHO criteria. From the comparison of CGA findings for the community-dwelling elderly among the three developmentally different areas, it is supposed that economical and social development might bring higher ADLs, higher QOLs in some items, higher BMI, higher blood pressure, higher serum lipid levels and hemoglobin concentration, and more appropriate control for risk factors in the community-dwelling elderly population. In a cross-sectional comparison of CGA findings of the elderly between under-developed Ngoc Quan and semi-developed Viet-tri city in Vietnam, we might be able to find the longitudinal process that Japan had traced during the past several decades. This international comparative study may have some study limitations including the use of translated interview questionnaires for ADL and QOL. However, we tried to translate validated ADL and QOL assessment from English to Vietnamese and to counter-translate from Vietnamese to English to get the most appropriate Vietnamese questionnaire.^{2,6,11} In spite of differences in history, culture, habits and medical development between Vietnam and Japan, this

preliminary international cross-sectional comparison of CGA for community-dwelling elderly may contribute to clarifying a fragment of the real situation with regard to health for the Vietnamese elderly population compared with that of the Japanese population.

Conclusion

The comparison of CGA findings among community-dwelling elderly in under-developed Ngoc Quan village, in semideveloped Viet-tri city in Vietnam and in highly developed Kyoto in Japan reveals that all ADL scores except those relating to social role, QOL scores, BMI, serum lipid levels and hemoglobin concentrations in the elderly were lowest in Ngoc Quan and highest in Kyoto. It is supposed that economic and social development might bring higher CGA, better-nutritional state and more appropriate control for risk factors on the community-dwelling elderly in a economically developmental dose-responsive manner.

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ORIGINAL ARTICLE

Comprehensive geriatric assessment for community-dwelling elderly in Asia compared with those in Japan: IV. Savannakhet in Laos

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Background: The objective of the present study is to compare the findings of comprehensive geriatric assessments (CGA) of community-dwelling elderly people living in Lao People's Democratic Republic (Laos) with those in Japan.

Methods: A cross-sectional, interview- and examination-based study was undertaken. The subjects consisted of community-dwelling elderly people in Songkhon, a rural district in Laos and in Sonobe, a rural town in Kyoto, Japan. Two hundred and ninety-four people aged 60 years and over in Laos and 411 aged 65 years and over in Japan were examined using a common CGA tool. Interviews pertaining to activities of daily living (ADL), medical and social history, quality of life (QOL) and Geriatric Depression Scale as well as anthropometric, and blood chemical examinations were included in the assessment.

Results: All scores for basic and instrumental ADL, intellectual activity and social roles, body mass index, prevalence of hypertension, mean total and HDL cholesterol levels were lower in Laos than in Japan, while prevalence of depression, impaired glucose tolerance and anemia were higher in Laos than in Japan.

Conclusion: Differences in lifestyle and medical status were found between economically developing Laos and highly developed Japan. Almost all comprehensive geriatric functions such as ADL, QOL, mood and nutritional condition in blood chemistry were lower in the elderly in Songkhon than in Kyoto. Of particular note were the higher prevalence of diabetes mellitus and anemia and lower prevalence of hypertension in the elderly population in Songkhon district, which should be examined in future studies.

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

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Introduction

The elderly population in Japan is growing at the fastest rate in the world. In response to the increasing population of the elderly, how to provide efficient and effective

health care to older persons has become an issue of intense debate.

In the twenty-first century, the elderly population in each country in South-east Asia will grow rapidly as it has done in Japan. In Lao People's Democratic Republic (Laos), the percentage of elderly people aged 65 years and over is projected to increase from 5% in 2000 to 14% in 2050.¹ We have carried out comprehensive assessments of the medical functions of community-dwelling elderly and provided efficient education to promote healthy lifestyles in the elderly population of Japan.²⁻¹² Adding to the longitudinal geriatric intervention study in Japan, we also investigated older subjects living in Singapore,¹³ Korea,¹⁴ Indonesia and Vietnam.^{15,16} As a result, diseases and frailty in community-dwelling older people are found to be influenced by such ecologic differences as the natural environment, historical background, lifestyle, personal habits, religion and health promotion policies in the area. With longer life spans and decreasing birth rates, demographic aging is now an established trend not only in Western countries but also in Asian ones. The issue of efficient health-care for the elderly is therefore becoming more urgent even in the South-East Asian countries. To achieve appropriate policies to detect ecology-related risk factors for frailty in the elderly and to help prevent the disabilities in the elderly population, and also to provide useful welfare services to the frail elderly, further investigation is needed, such as comprehensive field-work surveys with regard to health and the prevalence of disease in community-dwelling elderly people.

Comprehensive geriatric assessment involves the evaluation of the physical, psychosocial and environmental factors that impact on the well-being of older individuals. The use of an organized approach with objective measurements helps target key areas of functional status. Important areas include the evaluation of activities of daily living, cognition, mood, social supports, gait and falls, nutrition, sensory impairment, incontinence, polypharmacy, elder abuse, pressure sores, pain and advance directives. The provision of primary and secondary prevention is also increasingly important for older individuals.¹⁷ The Comprehensive Geriatric Assessment program can improve functional status; reduce the use of medications, nursing homes and medical services; it can also reduce mortality rates and the length of the initial hospital stays and of subsequent readmissions. A well-targeted Comprehensive Geriatric Assessment program and the control of patients' adherence to recommendations are effective in improving the well-being of elderly patients.¹⁸⁻²⁰

Aging is inevitable and therefore universal, but there is diversity in aging. Aging is associated not only with genetic factors but also with culture and environmental factors. That's why we are conducting this comparative field-work survey of community-dwelling elderly in

Asian countries to examine the association among human health and aging, culture and nature. We have shown the association between health status and subjective economic satisfaction in West Papua and high prevalence of hypertension in Singapore.^{21,22} But there has been no international comparative study of comprehensive geriatric assessments of community-dwelling elderly.

Laos is one of the developing countries in South-East Asia and there are many differences in lifestyles, medical conditions, economic status, ethnicity and natural ecology compared with Japan.²³ In this paper, one of a series of five consecutive studies of geriatric comparisons between Asian countries and Japan, we report on geriatric indicators such as activities of daily living (ADL) and quality of life (QOL) as well as blood pressure and blood chemical findings in the elderly living in six villages in Songkhon District in Savannakhet Province in Laos. This medico-ecologic study is intended to clarify the actual medical and geriatric conditions of elderly people in Laos and may contribute to future strategies to promote the health of the elderly in Laos as well as in Japan.

Methods

Subjects

The study population consisted of 294 community-dwelling elderly subjects aged 60 years and older (male: female = 121/173; mean age: 69.6 years) living in six villages (Lahanam Thong, Bngkhamlai, Thahkamlian, Dong Bang, Lahanam Tha, Kokphok) in Songkhon district in Savannakhet Province in Laos, and 411 people aged 65 years and more (male : female 174 : 237; mean age: 71.7 years) living in Sonobe town in Kyoto in Japan (Fig. 1). The six villages in Songkhon have a total population of 4233 people with 369 people who were 60 years old and more and we were able to examine 294

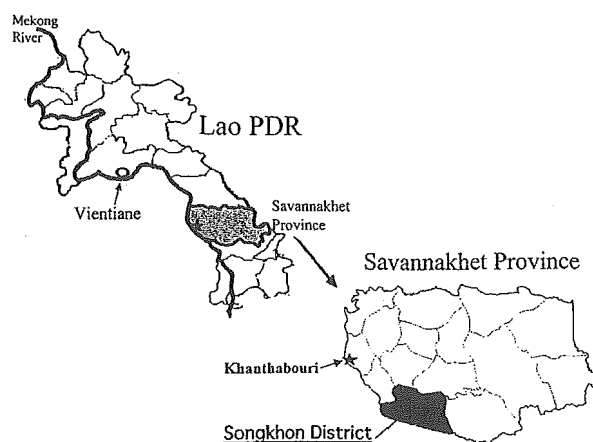


Figure 1 Map of the study area.