

## 人類生態班

Aging, Diseases and Ecology in Community-Dwelling people living Songkohn District III~ IV

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## 1. INTRODUCTION

This medico-ecological research intends to clarify the medical and geriatric actual conditions of community-dwelling people in the villages in Laos and may contribute to future strategy to promote the health of the elderly in Lao communities as well as in Japanese ones.

In the first survey in February in 2004, study population consisted of 295 elderly people (M:F=119:186, mean age: 69 years old, living in mainly 6 villages (Lahanam Thong, Bngkhamlai, Thakhamlian, Dong Bang, Lahanam Tha, Kokphak) in Songkhon district in Savannaket Province.in Lao PDR.

In the second survey in December in 2004, study population consisted of 313 elderly people (M:F=126:187, mean age: 69 years old) living in 9 villages (Lakmenang, Lattanalasy, Nakhammonh, Nouanvilay, Paxon, Oudomsine, Salakham, Sebouhenang, Thongsy mouang) in Songkhon district in Savannaket Province.in Lao PDR.

Compared with Japanese elderly, in ADLs all scores of basic and instrumental ADL, intellectual activity, and social role were lower in Lao PDR than in Japan. Prevalence of depression was higher and QOLs were lower in Lao elderly subjects than in Japanese ones. Body mass index, prevalence of hypertension, and mean total and HDL cholesterol level were lower in Lao PDR than in Japan, while prevalence of impaired glucose tolerance and anemia were higher in Lao PDR than in Japan.

In further examination for diabetes mellitus and impaired glucose tolerance the prevalence of DM (2h BS>200 mg/dl) was as much as 17% and that of impaired glucose tolerance (IGT) (2h BS>140 mg/dl) was 11 % in Lahanam and Paxon after 75 g oral glucose tolerance test. The prevalence of DM (16.0, 17.7%) and IGT (11.8, 9.5% ) in old people were not different in Lahanam and Paxon zone.

As higher prevalence of diabetes mellitus in the elderly population in Songkhon district was found in the first and second survey, the prognosis of Diabetes Mellitus should be followed up and clarified in the third survey.

In the survey of Adult Health and Nutrition unit in 2004-2005, IGT and DM were prevalent in female people aged from 50 to 59 years old (19 % ). While, metabolic syndrome, consisted of obesity, hypertension, lipid abnormality and impaired glucose tolerance (IGT), has been regarded as the important high risk state for arterio-sclerotic diseases in many developed countries. It may become also the important problem in Lao PDR with the nutritional transition. So in this survey people aged from 50 to 60 living in Lahanam and Paxon will be examined by chemical blood test (blood sugar insulin and lipids and so on), blood pressure, and anthropometry (circumference of waist, height and weight) to examine DM, IGT and metabolic syndrome.

To study further examination of the relationship between ecology, economics and diseases and health status, elderly people in Songkohn district should be compared with those in different communities in Northern area in Lao PDR and in different countries.

## 2. OBJECTIVES

The first purpose of the third study is to clarify the prognosis of diseases (DM, anemia and hypertension), disabilities and complication of stroke and peripheral neuropathy in elderly people living in Songkohn district in Lao PDR (*Prognosis study*).

The second purpose of the third study is to clarify the relationship of diseases and disabilities with history. Visitation of Savannakhet hospital and Mahosot hospitals, interview from doctors about history of diseases in patients and search for historical documents are planned. (*History of transition of diseases in Lao PDR*).

The third purpose is to clarify the prevalence of DM, IGT and metabolic syndrome in 400 people aged from 50 to 59 living in Lahanam and Paxon. (*Metabolicsyndrome over 50 years*)

The fourth purpose is to compare the prevalence of DM among Songkhon in Laos, Khon Kaen in Thailand, and Xishuangbanna in Yunnan Province in China. (*Comparison of the prevalence of DM in other countries*)

## 3. SUBJECTS AND METHODS

### 1) Prognosis study

The subjects are 295 elderly in Lahanam and 313 elderly in Paxon in the first and second survey in February and December in 2004. According to the information from village leaders about deaths, apparent diseases or problems, those the elderly have suffered from since the 1st or 2nd survey, preliminary home-visit with the 5 medical sta s in SDH was carried out. In the home-visit, interview of the questionnaire and medical histories, physical and neurological examination were carried out. For some elderly with DM, examination of blood sugar was carried out with their agreement and the results were told to them.

### 2) History of transition of diseases in Lao PDR

Exchange of information was carried out with Director and vice Director of Provincial Hospital in Savannakhet and with vice Director of Mahosot hospital.

### 3) Metabolic syndrome over 50 years

Examination of 77 people in Lahanam and 102 people aged from 50 to 59 in Paxon were carried out. Examination of 180 old people (168 were the second time) in Lahanam and 108 old people over 60 years old (99 were the second time) in Paxon by physical examination were carried out. They were examined by chemical blood test (blood sugar, insulin and lipids and so on), blood pressure, and anthropometry (height, weight, circumference of waist) to examine DM, IGT and metabolic syndrome. Short questionnaire were asked for medical history and activities of daily livings.

We used the revised Japanese criteria for Metabolic syndrome. Central obesity , as assessed by waist circumference over 90 cm for men and over 80 cm over women (criteria for South Asians), is essential. Plus 2 or more of the following, dyslipedemia; triglycemid over 150 mg/dl or HDL under 40 mg/dl, hypertension ; blood pressure over 130/85, and high blood sugar; fasting blood sugar over 110 mg/dl.

### 4) Comparison of the prevalence of DM with communities in other countries

198 elderly subjects aged 60 years or older (male:92 female:106, mean (SD) mean age:68.2 years) living in Thang Kuang village in Wang Noi district and 207 ones (male:50 female:157, mean age:68.6 years) living in Khon Kaen township in Thailand were examined.

201 elderly subjects (male:88 female:113, mean age:69.6 years) living in Jing Hong in Xishuangbanna in Yunnan Province in China were examined..

## 4. RESULTS

### 1) DM and prognosis of death

14 people had died in 295 elderly subjects in Lahanam zone 17 months after the survey in February in

2004. 6 people had died in 313 elderly in Paxon 7 months after the survey in December in 2004. We could visit 6 homes in Lahanam zone and 4 homes in Paxon zone. The cause of death were DM (2 cases), liver cancer (2cases), pharyngeal tumor, Stroke and others. As much as 5 people had history of DM (36 %), 5 had no history and 4 were unknown in 14 dead elderly in Lahanam (Table 1). We analysed the association of the history of DM with death in multiple logistic regression analysis. DM (Odds ratio 4.8, at least) was the risk factor for death adjusted by age and sex. Male (Odds ratio 6.7, at least) was also the risk factor (Table 2).

Table 1. Lists of elderly who passed away after participation in the survey in Lahanam(Feb 2004) & Paxon (Dec 2004)

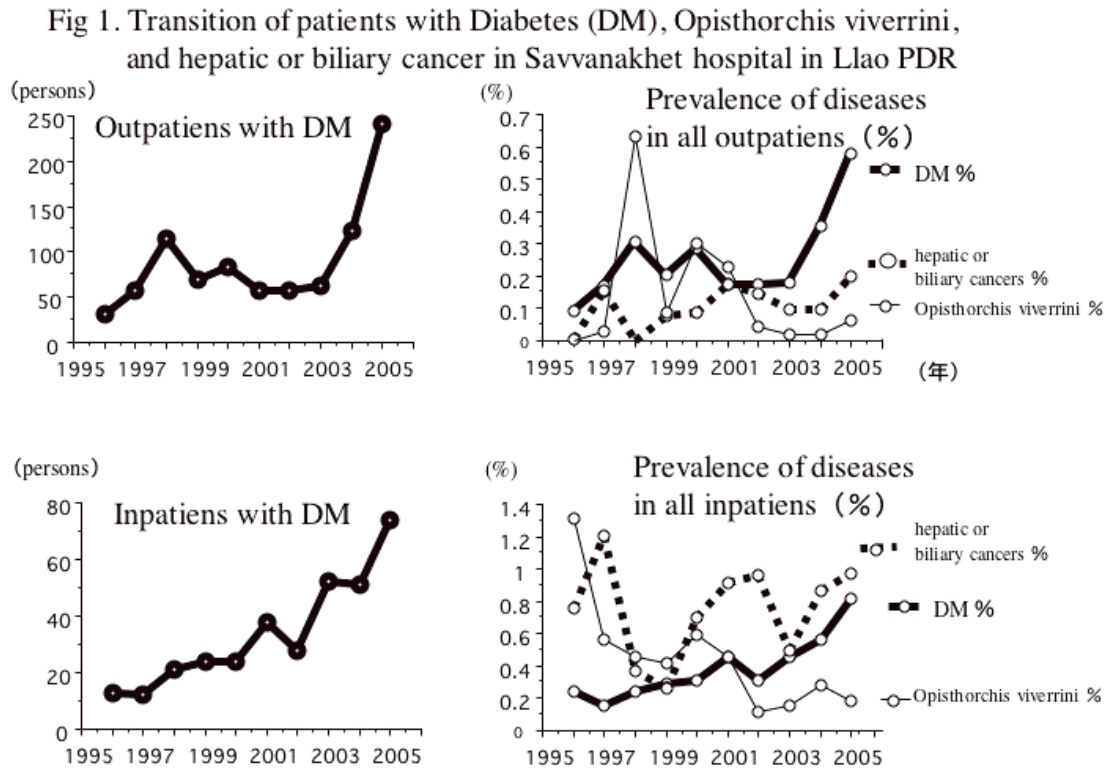
zone	Elderly Village	AGE	SEX	Dead (month, year)	Cause of Death	History of DM
Lahanam L-1	Lahanam Tha	98	M	2.2005	fever & headache	no
Lahanam L-2	Lahanam Tha	69	M	unknown	unknown	unknown
Lahanam L-3	Lahanam Tha	68	M	unknown	unknown	unknown
Lahanam L-4	Lahanamthong	80	F	11, 2004	DM	DM
Lahanam L-5	Lahanamthong	62	M	8, 2004	nephrotic syndrome, DM	DM
Lahanam L-6	Lahanamthong	68	F	unknown	unknown	DM
Lahanam L-7	Lahanamthong	78	M	unknown	unknown	DM
Lahanam L-8	Lahanamthong	78	M	unknown	unknown	no
Lahanam L-9	Thakhamlian	75	M	7, 2005	pharyngeal tumor	unknown
Lahanam L-10	Thakhamlian	64	F	9, 2004	Cancer of Liver	unknown
Lahanam L-11	Thakhamlian	70	M	9, 2004	Cancer of Liver	no
Lahanam L-12	Dong Bang	76	M	unknown	unknown	DM
Lahanam L-13	Bengkhamlai	78	M	unknown	unknown	no
Lahanam L-14	Bengkhamlai	68	M	unknown	unknown	no
					Infectious bowel disease	
Paxon P-1	Nakhammonh	60	F	7.2005	and peritonitis?	no
Paxon P-2	Oudomsime	61	F	unknown	unknown	no
Paxon P-3	Paxon	80	M	3.2005	HT, Stroke	no
					Severe headache, chest	
Paxon P-4	Sebouhenang	67	F	4.2005	pain and back pain	no
Paxon P-5	Sebouhenang	85	M	unknown	unknown	DM
					Macro-Hematuria, Renal	
Paxon P-6	Thongsymouang	75	M	6.2005	insufficiency	no

Table 2. DM is the risk factor for death adjusted by age and sex in multiple logistic regression analysis in Lahanam

	Odds ratio	p
Diabetes Mellitus	4.8	0.03
Sex: Male	6.7	0.02
Age	1.1	0.07

2) Annual change of DM patients in Savannakhet Provincial Hospital in 10 years (by the statistic data from Savannakhet Provincial Hospital)

The prevalence of patients of DM is increasing recently in all out-patients, i.e. 0.2% (2002), 0.2% (2003), 0.4% (2004) and 0.6% in 2005. The prevalence of patients of DM is also increasing recently in all in-patients was 0.3% (2002), 0.5% (2003), 0.6% (2004) and 0.8% (2005). While, the prevalence of patients of *Opisthorchis viverrini* is decreasing (Fig 1).



3) Metabolic syndrome over 50 years

The prevalence of metabolic syndrome over 50 years were 12.6% in Lahanam and 13.3% in Paxon and there was no significant difference between them. The prevalence of metabolic syndrome over 60 years were 14.4% in Lahanam and 9.1% in Paxon and there was no significant difference between them. The prevalence of metabolic syndrome from 50-59 years in Paxon were higher (19.5%) than in Lahanam (8.6%) with the different tendency between them ( $p=0.059$ ).

The prevalence of diabetes mellitus and impaired glucose tolerance from 50-59 years in Paxon were higher (DM; 19.5%, IGT; 7.8%) than in Lahanam (DM; 8.6%, IGT; 1.4%) significantly ( $p=0.023$ ).

4) Comparison of the prevalence of DM with communities in other countries

The prevalence of DM type (casual blood sugar over 200 mg/dl or taking medicine for DM) in Jing Hong (Yunnan Province in China), in Songkhon (Laos), in Thang Kuang village (Thailand), and Khon Kaen township (Thailand) were 7, 16, 23, and 39% respectively.

4. Discussion

In this survey visiting of home with dead elderly and DM were carried out. DM was the risk factor for death adjusted by age and sex (Odds ratio 4.8). Two elderly were died of liver cancer. One elderly, who did not participate the survey in Paxon, died of cholecystic cancer. Those may be associated with *Opisthorchis viverrini*,

which is known to be the cause of malignancy of chole-biliary system.

High prevalence of Diabetes in the elderly in a rural area in Laos may be associated with many factors, such as ethnic and genetic vulnerable factors, rapid economic development followed by nutritional transition, and other additional factors, like the “ fetal origins of disease” hypothesis, which postulates that early undernutrition increases the risk of certain chronic diseases in adulthood. People subsist by agriculture and their staple diet is sticky rice in Songkhon. Recently there is no scarcity of food and no experience of malnutrition by the development of irrigation in the paddy fields. Some hypotheses are suggested for high prevalence of diabetes in low economic status. The first is the unbalanced diet of enough sticky rice, which has 1.4 times higher calory and 2.0 times higher glycemic index than ordinary rice, with paucity of other foods. The second is the availability of cheap and energy-dense foods with more sugar in the globalization of food markets. The third is the hypothesis of “ fetal origins of disease”, which postulates that early undernutrition causes an irreversible differentiation of metabolic system, which may, in turn, increases the risk of diabetes with energy-dense foods in adulthood. Poor old people in the villages may be vulnerable to DM by those combined reasons. More elderly in Lahanam had the experience in the flood in 1976 and 1978 than people in Paxon (not significant statistically). As the prevalence of DM (16.0, 17.7%) and IGT (11.8, 9.5%) in people over 60 years old were not different in Lahanam and Paxon zone, malnutrition due to flood or other causes may not be related to the onset of DM but further examination is needed. There is the the food taboo of avoidance of meat after delivery in Lao female and almost of female elderly (79 %) with DM had practiced the food taboo. We should examine further the association between onset of DM and the taboo which may be one factor of malnutrition. People in Songkhone eat raw fish and almost people have the chronic infection of *Opisthorchis viverrini*. The chronic infection may be the one factor of causing insulin resistance. It is necessary to investigate the causes of the high prevalence of DM and IGT and their risk factors in Laos to prevent not only DM, but also successive cardiovascular diseases, which are increasing in Asian countries.

The DM patients in Savannakhet Provincial Hospital are increasing recently but the percentage in all patients are still very low notwithstanding the high prevalence of DM. in community. As there are difficulties in the continuous treatment by medication for DM patients in economical conditions and other reasons in rural community-dwelling people, dieting, exercise and occasional blood sugar check may be important actually in this situation.

In the comparison of the prevalence of DM in Jing Hong(Thai) , in Songkhone in Laos and in Khon Kaen (Issan), the prevalence of DM was very related to the development of economic condition of the people. Compared with the esthnic of Songkhon (Phuthai) that of Khon Kaen (Issan) is closer than that of Jing Hong(Thai). The prevalence of DM and mertabolic syndrome was higher in people aged 50-59 in Paxon than in Lahanam. The younger people may have the more influence of the nutritional transition with the development of economic globalization.

In the next year examination of people in the northern area in Laos are planned and their health status and life style should be compared with people in Songkhone.

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## 要旨

ラオスにおける高齢者の糖尿病について、身体に刻まれた歴史と文化の側面から考察した。糖尿病に関する歴史、文化的背景（ラオス～サバナケット）として、7~10世紀頃の中国南部より東南アジアへのタイ系民族の移動に始まり、ラオ民族のもち米の主食化がある。うるち米に比べて、高カロリー（1.4倍）かつ高 Glycemic index（2.0倍）であるのが、うるち米の特徴である。魚の生食とタイ肝吸虫の慢性感染、妊婦の産後数ヶ月のタンパク摂取制限（タブー）、1974年以降の JICA も絡んだサトウキビ畑の大規模開発による砂糖の市場への普及（モノ班、天理教資料より）、1978年の大洪水による食糧難（特にラハナム）（過去に繰り返している可能性）、1997年以降のラハナムの灌漑設備による2期作による収量増加と余剰による換金化の可能性などの経済的な要因とライフスタイルの影響が糖尿病の増加に影響している可能性がある。この10年間、サバナケット病院の糖尿病受診者が実際増加しているが、地域住民の高い有病率から考えるとまだかなり少ない。伝統的なライフスタイルのラハナムと、市場経済の浸透し始めているパキソンを比較すると、高齢者の糖尿病の頻度に差はないが、50歳台の糖尿病やメタボリックシンドロームの頻度は、パキソンの方が高い。若年者のライフスタイルや栄養転換の市場経済による影響の変化が大きいことが考えられる。同じ民族背景をもつが、経済的に発達しているタイのコンケンでは、糖尿病の頻度ははるかに多くなっていることから、ラオスにおける糖尿病の将来の増加が危惧される。糖尿病の予防に向けての、今後の対策が急務である。来年度は、ラオスの北部住民における生活習慣病を含めた健康状態を調査し、森林農業班との資源、土地利用との関連から分析するとともに、南部の住民との比較を行うことにより、老化と疾患に及ぼす生態史的アプローチを深めていこうと考えている。