Prevalence of Epilepsy in Rural Thailand : A Population-Based Study

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Abstract

Background : A study of the community-based burden of illness based upon prevalence is needed to plan intervention strategy.

Purpose : To determine the prevalence of epilepsy in a rural population in Thailand.

Method : From January to June, 2000, all of the people in Talardkav sub-district were invited to be interviewed and examined by a neurologist who visited their village.

Results : Of the 2,069 people in 553 households who gave information (72.2% of the total households), 43 had a history of seizure and of the 43, 15 were epileptics. The prevalence of epilepsy was estimated at 7.2 per 1,000 population. The highest two peaks were in the age groups of 5-9 and 25-34 years (17.0, 17.4/1,000, respectively).

Conclusion : The prevalence of epilepsy in rural Thailand is low, although probably under-estimated, but it is the best to date for rural Thailand.

Key word : Epilepsy, Epidemiology, Population-Based Study, Prevalence, Thailand

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Epilepsy is a disorder with significant social and economic consequences[1]. In Thailand, it is the third commonest neurological disease after cerebrovascular disease and headache[2].

Prevalence, as a measure of the disease burden in the community, should be considered when planning the health needs at local, regional and national levels[3]. The only previous study of the prevalence of epilepsy in Thailand reported a very low prevalence rate (2.8/1,000 population in those aged 15 years or more)[4].

The objective of this study was to determine the prevalence of epilepsy in a rural community in Thailand.

MATERIAL AND METHOD

This study was conducted in Nakhon Ratchasima province, the second largest of the 76 provinces in Thailand, located 254 km northeast of the capital, Bangkok. The province has an area of 20,494 km^2, divided into 26 districts, 287 sub-districts and has a total population of 1.77 million. The sub-district Talardkav, an average rural area, was chosen to survey people with a history of epilepsy because of its proximity (within 40 kilometers) to the Provincial Hospital. This sub-district has a population of 3,258, residing in 766 households in 11 villages in an area of 25 km^2. This population estimate is based upon a survey done by health volunteers and sub-district health officers every six months.

In this study, EPILEPSY was defined as two or more clinical afebrile seizures

- Unrelated to acute metabolic derangement or to withdrawal from alcohol or drugs[5].
- Excluding those which occur within a 24-hour period[5].
- Excluding those in which the diagnosis of epilepsy was questionable.

Each village in Talardkav sub-district was visited between January and June, 2000. In preparation, the authors met with all sub-district health officials, health volunteers and teachers in each village to discuss the objective and rationale of the survey. For seven days before the study, the sub-district health officers announced the date of study by the village intercom and the health volunteers went from door to door to tell all of the people whether they had or did not have a health problem, the date that the neurologist would visit their village to examine the people health, providing free common drugs and education related to their health problems and to invite them to have an examination on that date.

On the study day, a team consisting of sub-district health officials, health volunteers conducted general examinations (body weight and blood pressure) of all of the people and then the neurologist administered the screening questionnaire (Placentia et al)[6] in groups, consisting of six to eight persons from two to three families. They provided information about themselves and their children, and about those who were mentally retarded, demented or psychotic or who were not present. If the screening was suggestive of epilepsy, the neurologist conducted an in-depth interview with the individual; for those retarded, demented, psychotic or absent and for young children, with the parents or caregivers; for school aged children with both their parents and teachers. All of them were examined by the neurologist and provided with common drugs and education related to their health problems.

RESULTS

Population and sample characteristics

During the survey, 2,069 (69.5%) in 553 households of the total 3,258 people in 766 households gave the information. The remaining 1,189 did not because nobody in the household came and it was not possible to determine why they did not.

The gender and age specific response rates of receiving the information are shown in Table 1. Overall and in all but the age group 25-34 years, the response rates were higher among the females; significantly so only for the overall response rate and for the response rates in the age groups 10-14 and 55-64 years. There was a reversal of this observation in the age group 25-34 years, where the response rate was higher but not significantly so among the males. The response rates were lowest among those aged 15-44 years, (56.9%), with higher rates in the children (74.5%) and in the older adults (65.9%); p-value <0.001.

Seizure and epilepsy distribution

Among the 2,069 subjects who gave information, there were 43 (20.8/1000) with a history of seizure (Table 2). Of these 43, only 15 were diagnosed as epileptics. More of the 28 non-epileptics were male (52.9%) and most (82.1%) had had a febrile convulsion. Seizures related to withdrawal from alcohol were only found in the males.

Table 1. Gender and age specific response rates.

Age group (year)	Males		Females		Both genders		P-value (age specific)
	n/N	%	n/N	%	n/N	%	
0-4	83/110	75.5	96/115	83.5	179/225	79.6	ns
5-9	82/120	68.3	94/129	72.9	176/249	70.7	ns
10-14	94/137	68.6	97/122	79.5	191/259	73.7	<0.05
15-24	159/278	57.2	164/272	60.3	323/550	58.7	ns
25-34	148/250	59.2	140/267	52.4	288/517	55.7	ns
35-44	128/234	54.7	150/262	57.3	278/496	56.0	ns
45-54	100/163	61.3	123/179	68.7	223/342	65.2	ns
55-64	76/126	60.3	105/141	74.5	181/267	67.8	<0.05
65+	89/149	59.7	141/204	69.1	230/353	65.2	ns
All age groups	959/1,567	61.2	1,110/1,691	65.6	2,069/3,258	63.5	<0.01

n = Respondents
N = Population
ns = not significant

Table 2. Distribution by gender in those with seizures and epilepsy.

Seizure classification	Male		Female		Total	
	N	%	N	%	N	%
A. Total Epileptics	**5**	**100.0**	**10**	**100.0**	**15**	**100.0**
I. Generalized type	3	60.0	3	30.0	6	40.0
- Generalized tonic clonic	3	60.0	1	10.0	4	26.6
- Absence	0	0	1	10.0	1	6.7
- Generalized tonic	0	0	1	10.0	1	6.7
II. Localization related type	1	20.0	6	60.0	7	46.7
- Simple partial	0	0	1	10.0	1	6.7
- Complex partial	0	0	1	10.0	1	6.7
- Partial with secondarily generalized	1	20.0	4	40.0	5	33.3
III. Unclassified	1	20.0	1	10.0	2	13.3
B. Total Non-epileptics	**17**	**100.0**	**11**	**100.0**	**28**	**100.0**
I. Febrile convulsion	14	82.4	9	81.8	23	82.1
II. Single seizure	0	0	1	9.1	1	3.6
III. Seizure related to						
a) Acute Metabolic condition	2	11.8	1	9.1	3	10.7
b) Withdrawal from alcohol	1	5.9	0	0	1	3.6

In contrast, most of the 15 epileptics were female (66.7%). Slightly more of the epileptics were classified as having a localization related type of epilepsy (46.7%).

Prevalence rates

Of the 2,069 who gave information, only 15 were considered to be epileptics. This would yield a crude prevalence rate of epilepsy of 7.2 per 1,000 population (15/2,069) or a rate of 4.6/1,000 (15/3,258) if all the non-givers were assumed to have no history of epilepsy.

As shown in Table 3, the prevalence in females (9.0/1,000) was nearly twice that of the males (5.2/1,000); with the difference greatest in three age groups: 5-9 years (21.3 *vs* 12.2/1,000); 25-34 years (28.6 *vs* 6.8/1,000) and 45-54 years (16.3 *vs* 0/1,000).

DISCUSSION

Although examination was offered to all residents of Talardkav Sub-District, the response rate of receiving information was only 69.5 per cent. Most Thai people in a rural area are likely to visit a mobile medical service to obtain medication even if they

Table 3. Gender and age specific prevalence of epilepsy.

Age group (year)	Males		Females		Total		P-value
	n_1/n	n_1/1,000	n_1/n	n_1/1,000	n_1/n	n_1/1,000	
0-4	0/83	0	0/96	0	0/179	0	-
5-9	1/82	12.2	2/94	21.3	3/176	17.0	ns
10-14	0/94	0	1/97	10.3	1/191	5.2	ns
15-24	1/159	6.3	0/164	0	1/323	3.1	ns
25-34	1/148	6.8	4/140	28.6	5/288	17.4	ns
35-44	1/128	7.8	0/150	0	1/278	3.6	ns
45-54	0/100	0	2/123	16.3	2/223	9.0	ns
55-64	1/76	13.2	1/105	9.5	2/181	11.0	ns
65+	0/89	0	0/141	0	0/230	0	-
Total	5/959	5.2	10/1,110	9.0	15/2,069	7.2	ns

n = Respondents
n_1 = Epileptics
ns = not significant

have no definite medical complaint. They would only miss this opportunity when they thought their health was good and had something more important to do. It is possible that those not attending were concerned that their history of epilepsy would become known to either health officers or the community and, as a result, they or their family may become stigmatized. The same may be true for those who attended because the questionnaire was administered in a group setting. Epilepsy is a clinical diagnosis. Patient and eyewitness's information, therefore, is the key to making the diagnosis. However, most types of epilepsy involved loss of consciousness and then amnesia. Most of the time, the diagnosis, hence, can be made from only eyewitness's information.

There were 43 people with a history of seizures but only 15 were considered to be epileptic. In the non-epileptics, there was no marked difference between the males and females in the percentage of febrile convulsion and of seizure related to an acute metabolic condition.

Localization-related type of epilepsy was more common (46.7%) than the generalized type of epilepsy (40.0%). Neurocysticercosis, birth and accident related to head trauma might contribute to this high prevalence of partial epilepsy[3]. Generalized epilepsy has been the most common type reported in most community-based surveys[3,7-18]. This variation may be related to a lower level of case ascertainment of partial epilepsy, misclassification of a proportion of seizure[3,9], the time[3] and the method of diagnosis[13].

The crude prevalence rate of epilepsy in this study ranged from 4.6 to 7.2 per 1,000 population, which was quite low. However, similar prevalence rates have been reported by all community-based studies in Asia[3,4,7,19] (APPENDIX 1). Most studies in developing countries excluding Asia have found prevalence rates ranging from 8.5-57/1,000[8-13,20-23]. In developed countries, prevalence rates range from 7.5-10.4/1,000[14,24,25]. The exceptions are the studies done in Igbo-Ora, Nigeria (5.3/1,000)[20] and Riposto, Italy (2.7/1,000)[15]. Moreover, the difference in prevalence rates between developing and developed countries as shown in APPENDIX 1, are not marked. In the hospital-based studies, the prevalence rates showed wide variations ranging from 2.0-20.3/1,000[16-18,26,27].

In a previous study in Thailand, the prevalence of diagnosed epilepsy in the population aged ≥ fifteen years was 2.8/1,000[4], which is considerably lower than that found in the present study (4.6-7.2/1,000). The reason might be that the previous study was done by asking people whether they had been diagnosed as epileptic and that different definitions and criteria for making the diagnosis of epilepsy were used by the physicians who examined the patients[4].

The reasons for the low prevalence ratio of epilepsy in the present study might be the method of questionnaire administration and of receiving information. Epileptics with no obvious convulsion might be missed. Recall bias is possible; maybe intentional, possibly due to the fear of stigmatization or unintentional because of the forgetfulness or ignorance of

people to recall their previous symptoms. Incomplete information for making the diagnosis and the diagnostic method [e.g. no access to electroencephalography (EEG)] may also be responsible.

Most studies[3,7,11,13,15,19,20,24] have reported a higher prevalence of epilepsy in men, probably due to a higher frequency of head injury[13]. In the present study, gender-specific prevalence in women was nearly twice as high as in men (9.0/1,000 *versus* 5.2/1,000) without statistical difference. One of the reasons for the difference from many reported studies is the lower response rates among the males, possibly because even if they have epilepsy they need to work to support their household. The other maybe men do not admit the occurrence of seizures as frequently as women in community surveys[13].

The age-specific prevalence of epilepsy in this study classified in accordance with some other studies demonstrated that the prevalence of epilepsy was highest in two peaks, 5-9 and 25-34 age groups (17.0 and 17.4/1,000, respectively), which was similar to the data from the community of Riposto, Italy[15]. A possible cause of the highest two peaks' prevalence rate is the common onset of epilepsy in childhood and in young adult life[7]. In developing countries, most peaked in the second decade[3,9-11,13,14,19-21]. However, in developed countries, it has been shown to be higher with increasing age[14,16-18,27]. The lower prevalence rate of epilepsy in the elderly in developing countries may be related to multiple factors such as lower life expectancy[3], higher seizure-related mortality[3], and under-ascertainment of seizure disorders in this population[3].

The prevalence of epilepsy in rural Thailand was quite low compared to studies in developing countries[8,10,12,13,21-23]. Although this figure is the best to date, it is likely an underestimate of the true prevalence.

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APPENDIX 1

Summary of studies on the prevalence of epilepsy by type of study and country.

A. Community-based studies

Country	Year of study	Prevalence rates/1,000			Authors	Reference number
		Male	Female	Total		
I. In developing countries						
Africa						
- Igbo-Ora, Nigeria	1982	5.1	5.6	5.3	Osuntokun BO, et al	20
- Aiyete, Nigeria	*	28.0	44.0	37.0	Osuntokun BO, et al	21
- Rural area, Tanzania	1989	9.2	11.1	10.2	Rwiza HT, et al	11
- Zinvie, Africa	1997	*	*	33.5-35.1	Debrock C, et al	22
- Nakuru, Kenya	1985-86	*	*	18.2	Kaamugisha J, et al	23
Latin America						
- Republic of Panama	1988	*	*	57.0	Gracia F, et al	8
- Guatemala	*	*	*	8.5	Mendizabal JE, etal	9
- Bogota, Columbia	1974	15.5	22.9	19.5	Gomez JG, et al	10
- Ecuador	1986-87	*	*	12.2-19.5	Placencia M, et al	12
- Cordillera Province, Bolivia	1996	11.4	13.1	12.3	Nicoleeti A, et al	13
Asia						
- Republic of China	1983	5.0	4.1	4.6	Li SC, et al	7
- Kerala, South India	1996	5.2	4.6	4.9	Radhakrishnan K, et al	3
- Thailand, Nationwide	1991-92	*	*	2.8	Chuprapawan C	4
- Haryana, North India	1992-94	4.9	3.3	4.2	Singh A, et al	19
II. In developed countries						
- Sydney, Australia	1980	*	*	7.5	Beran RG, et al	25
- Copiah County, Mississippi	1978	12.4	8.6	10.4	Haerer AF, et al	14
- Silivri, Turkey	1994	10.4	10.0	10.2	Keraagac N, et al	24
- Riposto, Italy	1987	2.6	2.8	2.7	Reggio A, et al	15

B. Hospital-based studies

Country	Year of study	Prevalence rates/1,000			Authors	Reference number
		Male	Female	Total		
Bradford, England	1996-98	*	*	7.3	Wright J, et al	18
South Glamorgan, UK	1996	*	*	2.0-13.4	Morgan CLI	26
Rural Iceland	1993	4.6	9.4	7.3	Olafsson E, et al	17
Tonbridge, UK	1983	15.4	26.5	20.3	Cockerell OC, et al	16
England and Wales	1995	*	*	5.15	Wallace H, et al	27

* = Not mentioned

ความชุกของโรคลมชักในชนบทของประเทศไทย : การศึกษาบนพื้นฐานของชุมชน

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การศึกษาโรคที่เป็นปัญหาในชุมชนจำเป็นที่จะต้องทราบถึงความชุกของโรคนั้นเพื่อที่จะวางแผนในการหามาตรการในการควบคุม

วัตถุประสงค์ : เพื่อหาความชุกของโรคลมชักในชนบทในประเทศไทย

ผู้ป่วยและวิธีการ : การศึกษาเริ่มตั้งแต่เดือนมกราคมถึงมิถุนายน 2543 โดยชาวบ้านทั้งหมดที่อาศัยอยู่ในตำบลท่าลาดขาว อำเภอโชคชัย จังหวัดนครราชสีมาได้รับเชิญให้เข้ารับการตรวจโดยประสาทแพทย์ที่หมู่บ้าน

ผล : ชาวบ้าน 2069 ราย ใน 533 ครัวเรือน (คิดเป็นร้อยละ 72.2 ของครัวเรือนทั้งหมด) ถูกสัมภาษณ์และตรวจโดยประสาทแพทย์ 43 รายมีประวัติเคยชักมาก่อน มีเพียง 15 รายที่เป็นโรคลมชักซึ่งได้ค่าความชุกประมาณ 7.2/1,000 ประชากร ความชุกสูงสุด อยู่ในช่วงอายุ 5–9 ปี (17/1,000 ประชากร) และ 25–34 ปี (17.4/1,000 ประชากร)

สรุป : ความชุกของโรคลมชักในชนบทค่อนข้างต่ำกว่าความเป็นจริง แต่ก็เป็นข้อมูลที่มีอยู่ในปัจจุบันนี้เท่านั้น

คำสำคัญ : โรคลมชัก, ระบาดวิทยา, การศึกษาบนพื้นฐานของชุมชน, ความชุก, ประเทศไทย

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