THE PREVALANCE OF EPILEPSY AMONG COLLEGE STUDENTS IN CANAKKALE, TURKEY

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SUMMARY – The aim of this study was to investigate the frequency of epilepsy among students of the Canakkale Onsekiz Mart University. This cross sectional epidemiological study was performed on 4762 of 19,988 Canakkale Onsekiz Mart University students in the academic year 2007-2008. Participants that answered "epilepsy" to the question "Do you have any disease diagnosed by a doctor?" in a questionnaire including 4 subgroups were identified. Data were transferred to the Epi-Info Version 6.0 statistics program and controlled data were analyzed in the SPSS 15.0 statistics program. There were 53.1% of female and 46.9% of male students, mean age 20.4±2.1 (range 17-43) years. Twelve (0.25%) students had epilepsy diagnosis, eight (66.7%) female and four (33.3%) male, mean age 20.8±1.8 years. In our study, epilepsy was detected in 0.25% of students (n=12). Age specific prevalence studies related to epilepsy epidemiology are extremely rare, especially in university students with average intelligence. Thus, we considered that it would be epidemiologically significant to share the results of our cross sectional study with all those involved in epilepsy epidemiology and management.

Key words: *Epilepsy – epidemiology; Prevalence; Students; Turkey – epidemiology*

Introduction

Epilepsy is one of the most common chronic neurologic disorders which is characterized by recurrent seizures[1]. It is thought that 50 million individuals worldwide are affected with epilepsy[2]. General prevalence of epilepsy varies between 0.4% and 1.7% in all age groups[3-6]. The variability of results of epidemiological studies might be due to discrepancies in the definition and classification of epilepsy. On the other hand, prevalence and incidence studies display differences among countries. While the mean prevalence rate in developing countries is 18.5/1000, it is approximately 6/1000 in developed countries[7,8]. Although studies on the prevalence of epilepsy are limited in number, the reported prevalence rates range from 5.7/1000 to 11.2/1000[9-15].

Age specific prevalence studies related to epilepsy epidemiology are extremely rare. We present an epidemiological survey performed on university students with average intelligence as an interesting ratio in the cross sectional epidemiological study, as we believe it will contribute to the epidemiological data recorded in our country.

Material and Methods

Research area and population

The research was conducted in the academic year 2007-2008 at 9 faculties, 6 colleges and 7 vocational high schools situated in different campuses of the Çanakkale Onsekiz Mart University. A total of

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19,988 students received education in bachelor and college programs of the University during this period. There were 10,277 (51.4%) female and 9711 (48.6%) male students.

Type of research

This was a cross sectional epidemiological study in which the incidence of various diseases was analyzed. Assessment of the incidence of headache and accidents and state of mind of students were other aims of the research. In this article, data on the diagnosis of epilepsy in our student population are reported.

Population and sampling

Population of the study consisted of 19,998 bachelor and college students that received education in the academic year 2007-2008 at the Çanakkale Onsekiz Mart University. The minimum sample was calculated to 5034 subjects and 4762 (94.6%) of them were reached during the study. A stratified sampling method was used to determine sampling distribution. For this purpose, stratification was performed in accordance with the number of students in faculties and high schools. Students of the Faculty of Medicine other than freshmen were excluded from stratification because they studied at another university. However, 30 freshmen of the Faculty of Medicine were used in the questionnaire form pre-trial.

Study performance and data sources

The study was conducted by three co-researchers (Faculty members of Department of Neurology, Psychiatry and Public Health). Primarily, a written consent was taken from the University rectorate. Following this consent, support of the faculty and vocational school administrators was requested. Data collection was performed on the dates decided together with school administrators and under supervision of the researchers using the survey method.

Questionnaire form used in the research consisted of four parts. First part included questions related to descriptive characteristics besides questions regarding smoking, use of alcohol and drugs. Second part included questions regarding incidence and characteristics of headache, third part included questions regarding accident incidence in the recent year, and fourth part included questions regarding state of mind. Pre-trial of the survey was performed on 30 freshmen from the Faculty of Medicine. Questionnaire form was finalized following the pre-trial. Individual respondents completed the forms anonymously by using a nickname to avoid any bias or leading respondent towards an answer, and any stigma associated with questions about epilepsy, smoking, alcohol and drug usage.

Chronic diseases were questioned by the question "Do you have any disease diagnosed by a doctor?" Students that answered this question with "epilepsy" or conventional common names for epilepsy (*sara* and *sara hastalýgý*) were examined.

Statistical analysis

Data collected were transferred to the Epi-Info Version 6.0 statistics program by the researchers. After proper data control, they were transferred to the SPSS 15.0 statistics program and analyses were performed with this program.

Results

Mean age of 4762 participants was 20.4±2.1 (range 17-43) years. When distribution of the participants according to age groups was analyzed, only 16 participants were found to be above 30, while most participants were aged 17-24. Of those having filled out the questionnaire, 53.1% were female and 46.9% male (Table 1).

Twelve (0.25%) students participating in the study stated that they were diagnosed with epilepsy, 8 (66.7%) of them female and four (33.3%) male, mean age 20.8±1.8 (range 17-43) years.

Table 1. Demographic characteristics of student sample

	n	%
Gender		
Female	2531	53.1
Male	2231	46.9
Total	4762	100.0
Age		
17-20	2763	58.1
21-24	1886	39.6
25+	110	2.3
Total	4759	

Table 2. Relation between sex, income level and epilepsy incidence

	Epilepsy					
	No		Yes		Total	
Gender	n	%	n	%	n	%
Female	2523	99.68	8	0.32	2531	53.1
Male	2227	99.82	4	0.18	2231	46.9
Total	4750	99.75	12	0.25	4762	100.0
Income						
≤641$	3613	99.70	11	0.30	3624	76.7
>641$	1097	99.91	1	0.09	1098	23.3
Total	4710	99.75	12	0.25	4722	100.0

0.25% of the examined students had epilepsy; there was no significant difference in epilepsy incidence according to sex and income level

Students with epilepsy were analyzed with regard to the incidence of epilepsy according to gender and income and no significant relationship was found between either of these variables and epilepsy incidence (Table 2).

The relationship between the incidence of epilepsy and smoking, alcohol and drug use was investigated and no significant relationship was observed. Also, when drug use was questioned, history of drug use was not recorded in any of the students with epilepsy (Table 3).

Table 3. Relation between epilepsy incidence and smoking and alcohol-substance use

	Epilepsy					
	No		Yes		Total	
Cigarette	n	%	n	%	n	%
Never smoked	1658	99.82	3	0.18	1661	34.9
Smoked once	888	99.55	4	0.45	892	18.7
Ex-smoker	374	100.00	0	0.00	374	7.9
Occasional smoker	654	99.70	2	0.30	656	13.8
Regular smoker	1176	99.75	3	0.25	1179	24.8
Alcohol						
Never used	1605	99.81	3	0.19	1608	33.8
Used once	473	99.79	1	0.21	474	10.0
Used and quit	486	99.59	2	0.41	488	10.2
Occasional drinker	1798	99.67	6	0.33	1804	37.9
Regular drinker	388	100.00	0	0.00	388	8.1
Drug						
Never used	4450	99.73	12	0.27	4462	93.7
Used once	137	100.00	0	0.00	137	2.9
Used and quit	100	100.00	0	0.00	100	2.1
Occasional user	59	100.00	0	0.00	59	1.2
Regular user	4	100.00	0	0.00	4	0.1
Total	4750	99.75	12	0.25	4762	100.0

No significant relationship was observed between epilepsy incidence and smoking and use of alcohol and drugs. None of epilepsy patients was drug user.

Discussion

In this cross sectional epidemiological study conducted on university students, the prevalence of epilepsy was 0.25%. Epidemiological studies show that the incidence of epilepsy is bimodal. It is known that the incidence of epilepsy increases in early childhood and over 50 years of age. In developed countries, the prevalence is high in early childhood and low in early adulthood, with an increase recorded over 65 years of age[16-20].

There are a limited number of studies related to epilepsy in our country. In a study performed in Sivas in which 5294 people were scanned, the life-long epilepsy prevalence was found to be 6.3/1000. When the prevalence was evaluated in detail according to age, it was reported to be 1252 individuals aged 10-19 and 997 individuals aged 20-29, i.e. 8.78/1000 and 8.02/1000, respectively[11]. Karaagac *et al.* screened 4803 persons in rural Silivri and epilepsy prevalence was calculated as 10.2/1000. When age specific prevalence was evaluated, the mean prevalence of 10/1000 was reported in both 10-19 (n=905) and 20-29 (n=814) age groups[10]. In the study performed by Kilincer *et al.*, where epilepsy prevalence in Denizli was evaluated, it was found to be 5.7/1000. The researchers stated that they found the incidence of epilepsy to be lower than the incidences determined in previous studies conducted in other cities, and the reason for lower prevalence might be related to the higher education and development level; the results showed similarities with those obtained in other developing countries worldwide[14].

Epidemiological studies on epilepsy prevalence performed in specific age groups are very rare in our country. Epilepsy prevalence was 11.2/1000 in a study performed by Aydin *et al.* in Izmir on 4216 students aged 7-17[9]. Similarly, a prevalence of 8.6/1000 has been reported from a study performed in Trabzon on 4288 cases of 0-17 age group[15]. Huseyinoglu *et al.* screened 17,345 cases in Kars and calculated the prevalence of 8.6/1000 in the 6-14 age group[13].

Very few studies have been performed on the incidence of epilepsy among university students. In the awareness study performed on medical students in India, it is reported that 7.3% of 587 participants had a history of epileptic attack[21]. The reason for this ratio *per* general population, which is extremely high, might be related to the broadness of the scope of the question asked in the questionnaire on the history of attack and non-reflection of patients diagnosed with epilepsy.

In our study conducted on university students, the incidence of epilepsy was calculated to 2.5/1000. To the best of our knowledge, there is no epilepsy prevalence study specific to limited age interval performed on university students in our country. The high rates obtained in previous studies performed on general population can be explained by their including lower socioeconomic and rural populations. Also, the high rates obtained in studies performed in school children and 0-17 adolescents can be explained with the epilepsy syndromes specific for these age groups where they are encountered more frequently. We consider that the reason for the lower prevalence recorded in our study as compared with previous studies is normal intelligence and good education of our study participants. Our results were similar to the values recorded in developed countries with regard to age specific epilepsy prevalence.

However, epilepsy is one of the most common neurologic disorders that is still associated with stigma in the wider society[22]. In fact, epileptic patients usually fill in the forms with misinformation about their history of epilepsy, which may lead to wrong results in prevalence studies. To avoid this limitation, we asked the participants to complete their forms anonymously using nicknames by themselves, so we think that they answered the questions with no fear from epileptic stigma or usage of alcohol, drugs and smoking.

Besides, the relationship of epilepsy incidence with income level and gender showed no significant results. Similarly, no relationship could be found between epilepsy incidence and smoking and use of alcohol and drug.

Epilepsy prevalence studies are very important in our country for the awareness of epilepsy disorder. Our study conducted in young adults with normal intelligence is important for supplementing the prevalence studies performed before in various age groups and populations.

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Sažetak

UČESTALOST EPILEPSIJE MEĐU STUDENTIMA SVEUČILIŠTA CANAKKALE ONSEKIZ MART, TURSKA

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Cilj istraživanja bio je ispitati učestalost epilepsije među studentima Sveučilišta Canakkale Onsekiz Mart, Turska. Ova presječna epidemiološka studija provedena je na 4762 od 19.988 studenata ovoga Sveučilišta u školskoj godini 2007.-2008. Identificirani su sudionici koji su na pitanje "Imate li kakvu bolest koju vam je dijagnosticirao liječnik?" odgovorili "epilepsija" u anketnom upitniku s 4 podskupine pitanja. Podaci su preneseni u statistički program Epi-Info verzija 6.0, a provjereni podaci su potom analizirani pomoću statističkog programa SPSS 15.0. Bilo je 53,1% studentica i 46,9% studenata srednje dobi 20,4±2,1(17-43) godina. Dijagnozu epilepsije je imalo 12 (0,25%) ispitanika, osam (66,7%) studentica i četvorica (33,3%) studenata srednje dobi 20,8±1,8 godina. U ovoj studiji epilepsija je utvrđena u 12 (0,25%) ispitanika. Epidemiološke studije učestalosti epilepsije u određenim dobnim skupinama vrlo su rijetke, poglavito među studentima kao populaciji s prosječnom inteligencijom. Stoga smatramo da je važno rezultate ove naše presječne studije podijeliti sa svima koji se bave epidemiologijom i liječenjem epilepsije.

Ključne riječi: *Epilepsija – epidemiologija; Učestalost; Studenti; Turska – epidemiologija*