Basic Knowledge of Epilepsy among Medical Students

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Background: *The medical students' knowledge about basic medical neuroscience in the preclinical level may be fragmented and incomplete.*
Objective: *Evaluate the knowledge of students prior to a lecture on epilepsy in clinical level.*
Material and Method: *One hundred ten fourth-year medical students' knowledge was accessed by a self-administered questionnaire.*
Results: *The presented results revealed that 91.8% of respondents knew that epilepsy arose from a transient dysfunction in the brain. Generalized tonic-clonic seizures (GTCs) were the most common type (91.5%) they knew and absence seizures were the least common type (33.6%) they knew. All of them knew that eating pork and punishment of gods did not cause epilepsy. However, 50% thought that genetics was a cause and 80.3% did not know that stroke and sleep deprivation (92.7%) cause epilepsy. About treatment and prognosis, only 28.2% of respondents thought epilepsy can be cured and patients should take antiepileptic drugs (AEDs) for seizure free 2-5 years (48.2%), life long (33.6%). They knew that the patients should be prohibited from driving (80%), working on machinery (74.5%), and (27.3%) avoid drinking. However, they knew that the patients could marry (100%), get pregnant (98.2%), and lactate (91.9%). Regarding the first aid management, 50.9% of them recommended that placing a piece of wood between the teeth during a seizure and perform chest compressions (20.0%). Means knowledge scores is about 60%, the highest score is the definition of epilepsy (90.2%) and the lowest is type of seizure (43%).*
Conclusion: *The findings indicated that lecturers should review aspects of pathophysiology and emphasize on type of seizure, cause, consequences, and prognosis including first-aid management.*

Keywords: *Basic knowledge, Medical student, Epilepsy*

J Med Assoc Thai 2007; 90 (11): 2271-6
Full text. e-Journal: *http://www.medassocthai.org/journal*

Epilepsy is a common neurological disease; therefore, general practitioners and family doctors should have a good knowledge of its types, presentations, and treatments. Fourth-year medical students at the Faculty of Medicine, Khon Kaen University, Thailand, have a 1 hr lecture on epilepsy plus prior studies in basic science. In third-year preclinical neuroscience, the students should understand the fundamental concepts involved in epilepsy including neuropatho-physiology, neuroanatomy, classification of seizure types, common terminology in epilepsy, and

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antiepileptic drugs (AEDs), However, medical students' knowledge of the concepts of neuroscience may be fragmented and incomplete, which led the authors to revamp the content and desired post-lecture knowledge based on epilepsy for fourth-year medical students.

Objective

It is crucial for medical lecturers to identify the knowledge level of the medical students in order to prepare appropriate lessons. In the present research, the authors evaluated the knowledge of students prior to a lecture on epilepsy. Upon knowing the level of knowledge and weaknesses in each part of the epilepsy syllabus, attention can be directed at developing a more effective presentation and content for the fourth-year students and better integration between the preclinical and clinical levels.

Material and Method

The Epilepsy Research Group (EPREG) in Srinagarind Hospital was established in 2003 to provide education about epilepsy to medical students. A self-administered questionnaire on epilepsy was distributed to 110 fourth-year medical students who would be attending the epilepsy lecture (Table 1). The present study was conducted in 2005. The authors obtained the number of correct/wrong responses for knowledge on the subject matter.

The authors calculated the number of correct responses for each item (max = 50): 1) What is a seizure? (5); 2) What are the causes of epilepsy? (5); 3) What types of seizures are included? (10); 4) Is epilepsy curable? (5); 5) For how long should antiepileptic drugs be taken? (5); 6) What are the consequences of seizures? (10); and, 7) How should acute seizures be managed? (10). Statistical analysis included the percentage of correct responses and the means of the total scores.

Results

All of the medical students that attended the epilepsy lecture agreed to participate and compliance

Table 1. Epilepsy questionnaire

1. What do you think a seizure is? (Check all that you think apply)
   - [ ] an abnormal electrical discharge in the brain
   - [ ] demonic possession
   - [ ] divine punishment
   - [ ] an abnormal movement
2. What do you think causes epilepsy? (Check all that you think apply)
   - [ ] an evil spirit
   - [ ] a head injury
   - [ ] brain tumor
   - [ ] divine punishment for reneging on a vow
   - [ ] sleep deprivation
   - [ ] alcohol withdrawal or heavy drinking
   - [ ] stroke
   - [ ] genetic disease
   - [ ] high fever
   - [ ] eating pork
3. What are the types of seizures? (Check all that you think apply)
   - [ ] rigid then jerking (tonic-clonic seizure)
   - [ ] unusual sensation or abnormal jerking with preserved awareness (simple partial seizure)
   - [ ] lost awareness and physically disabled, repetitive involuntary movements (complex partial seizure)
   - [ ] loss of muscle strength and tone: the person collapses (atonic seizure)
   - [ ] staring spell, suddenly absent, loss of awareness (absence seizure)
4. Do you think epilepsy can be cured?
   - [ ] Yes
   - [ ] No
5. How long should antiepileptic drugs be taken?
   - [ ] for life
   - [ ] 2-5 years
   - [ ] only on the full moon
   - [ ] only during an episode
   - [ ] for 3-6 months
6. What are the consequences of epilepsy? (Check all that you think apply)
   - [ ] should not allowed to drive a motor vehicle
   - [ ] no sexual intercourse
   - [ ] cannot get married
   - [ ] should not work with machinery
   - [ ] cannot get pregnant
   - [ ] abruptly stop antiepileptic drugs during pregnancy
   - [ ] not able to lactate
   - [ ] should not eat pork
   - [ ] must quit work
   - [ ] should not drink alcohol beverages
7. What should be done during a seizure? (Check all that you think apply)
   - [ ] place the person in a semi-prone position to prevent choking
   - [ ] place something in the mouth to prevent biting the tongue
   - [ ] give an antiepileptic drug during the episode
   - [ ] restrain the person and perform chest compressions (CPR)
   - [ ] prevent injury during the episode

was indeed 100% vis-à-vis completing and returning the questionnaire before the lecture began. Tables 2 through 6 present percentage of answers to the questions and Table 7 presents the mean score for all of the knowledge questions.

Definition and types of seizures (Table 2)

"Seizure is an abnormal electrical discharge in the brain" was considered by 91.8% of respondents, while 15.5% thought it was a form of abnormal movement. "Generalized tonic-clonic seizures (GTCs)" were the primary type of seizures recognized by 95.5% of respondents, while 33.6% were aware of "absence seizures".

Cause(s) of epilepsy (Table 3)

The rank of causes of epilepsy given by respondents was brain tumors (81.8%), head injury (74.5%) and genetics (50%). None of the medical students thought that eating pork, witchcraft, or punishment by the gods for reneging on vow were causes of epilepsy. It should be pointed out that in the local vernacular epilepsy is described as *'wild pig disease'* hence the local belief of some sort of connection between eating pork and the illness.

Treatment and prognosis (Table 4)

Only 28.2% of respondents thought epilepsy was curable disease. While about 33.6%, 4.5%, and 13.6% thought epileptics needed to take AEDs for life, 3-6 months, and only when there is an attack, respectively.

Consequence of epilepsy (Table 5)

Most respondents (80.0%) knew that epileptics should not allowed to drive, while 1.8% thought patients should have not got pregnant or never have sexual intercourse. All of the students thought epileptic patients should not be forbidden to marry.

Helping epileptics during attack (Table 6)

Half of the respondents (50.9%) would try to put an object into the mouth to prevent the tongue from being bitten and 20.0% would try to restrained the patient and administer chest compression, or give AEDs during the attack.

The scores of knowledge (Table 7)

The knowledge scores included seven items and the mean score was about 60% (29.60/50.00). Knowledge about "What is a seizure" achieved the

Table 2. "What is an epileptic attack?" and "What are the types of seizures?"

Questionnaire	Answer (n = 110) (%)	
	Yes	No
What do you think an epileptic attack is?		
- An abnormal electrical discharge in the brain	91.8	8.2
- Demon possession	-	100
- An abnormal movement	15.5	84.5
What are the types of seizures?		
- Generalized tonic-clonic seizures	95.5	4.5
- Simple partial seizures	74.5	25.5
- Complex partial seizures	11.8	88.2
- Atonic seizures	43.6	56.4
- Absence seizures	33.6	66.4

Table 3. "What causes epilepsy?"

Questionnaire	Answer (n = 110) (%)	
	Yes	No
What do you think causes epilepsy?		
- Demons	-	100
- Head injury	74.5	25.5
- Brain tumor	81.8	18.2
- Divine punishment	-	100
- Sleep deprivation	7.3	92.7
- Alcohol withdrawal or heavy drinking	30.9	69.1
- Stroke	19.1	80.9
- Genetic disease	50.0	50.0
- High fever+	67.3	31.8
- Eating pork	-	100

+ Missing data 1

Table 4. "Do you think epilepsy is a curable disease?" and "For how long should antiepileptic drugs be taken?"

Questionnaire	Answer (%)
	Yes
Do you think epilepsy is a curable disease?	
- Yes	28.2
- No	71.8
How long to take antiepileptic drugs?	
- Life-long	33.6
- 2-5 years	48.2
- During an episode	13.6
- 3-6 months	4.5

Table 5. "What are the consequences of epilepsy?"

Questionnaire	Answer (n = 110) (%)	
	Yes	No
What are the consequences of epilepsy?		
- Should not allowed to drive	80	20
- Sexual intercourse	1.8	98.2
- Cannot marry	-	100
- Should not work with machinery	74.5	25.5
- Cannot become pregnant	1.8	98.2
- Must stop taking antiepileptic while pregnant	41.8	58.2
- Not able to lactate	9.1	91.9
- Cannot eat pork	-	100
- Must quit work	19.1	80.9
- Cannot drink alcoholic beverages	27.3	72.7

Table 6. "What should be done during a seizure?"

Questionnaire	Answer (n = 110) (%)	
	Yes	No
What should be done during a seizure?		
- Place in semi-prone position to prevent choking	61.8	38.2
- Place an object in the mouth to prevent biting the tongue	50.9	49.1
- Give antiepileptic drug during the episode	20.0	80.0
- Restrain and perform chest compressions (CPR)	20.0	80.0
- Prevent injury during episode	82.7	17.3

Table 7. Score of knowledge in each item

Items	Score (mean ± SD)
What is seizure? (5)	4.59±1.38
What are causes of epilepsy? (5)	2.41±0.96
What are types of seizures? (10)	4.30±2.12
Is seizure a curable disease? (5)	3.59±2.26
How long to take antiepileptic drugs? (5)	2.36±2.51
What is/are consequence of seizures? (10)	5.17±2.39
How to manage acute seizures? (10)	7.18±2.54
Total (50)	29.60±7.54

highest scores (90.18%), while knowledge scores about the causes and types of seizures and how long to take AEDs were answer correctly by < 50% of respondents. The different types of seizures had the lowest scores (43%).

Discussion

In the present study, the knowledge of fourth-year medical students' vis-à-vis epilepsy revealed a 60% total mean score of knowledge compared with 75% among fifth-year medical students[1] and 47.3% of first-year medical students[1]. Senior medical students had the best level of familiarity and knowledge[2].

Most (91.8%) of the respondents knew that an epileptic attack is an abnormal electrical discharge in the brain and none thought it was the result of any supernatural cause. By contrast, 30% of rural Ethiopians[3] and 60% of epileptics and their parents thought it had a demonic origin[4]. A significant proportion of respondents in other studies harbored supernatural associations as predisposing factors[5]. Similarly, Ismail et al reported that Muslims living in the UK believe that epilepsy is demonic[6] despite medical evidence showing that epilepsy arises from a transient dysfunction in the brain[7].

Since the present findings reflect medical students' understanding of epilepsy, it is of concern that 15.5% think an epileptic attack could simply be abnormal movement. Knowledge of the classification of seizure types revealed that 95.5% of medical students recognized GTCs, whereas most did not recognize complex partial (CPS) (88.2%) or absence seizures (66.4%), suggesting medical students had only heard about GTCs. A review of seizure types is obviously necessary.

Regarding the causes of epilepsy, none of the medical students subscribed to local folklore that the cause of the illness was from eating pork, witchcraft or punishment of the gods for reneging on a vow. Interestingly, a large number of the students did not realize that stroke (80.9%), alcohol withdrawal or heavy drinking (69.1%) and sleep deprivation (92.7%) could cause or induce epilepsy, while 67.3% of them knew that high fever in children could. Of note, 50.0% of the students thought epilepsy was genetic in origin, similar to a report from Rahman (67%)[8], albeit no more than 1-2% of cases are due to genetic disorders[7].

Regarding epilepsy management, 48.3, 13.6 and 4.5 percent of the respective medical students thought epileptics should take AEDs for 2 to 5 years,

only during an attack and 3 to 6 months. Although all of the respondents had learned about epilepsy in the preclinical setting, not even one-third (28.2%) knew that epilepsy can be cured, less than the 46.3% reported by Rahman[8], suggesting most of the presented students (71.8%) retain misconceptions about the prognosis of epilepsy.

Vis-à-vis the consequences of epilepsy, some respondents had incorrect knowledge as they would stop AEDs during pregnancy (41.8%) thought mothers would not be able to lactate (9.1%) and should not have sexual intercourse (1.8%). Most (80.0%) respondents knew that epileptics should not be allowed to drive. In addition, 74.5% knew that the people with epilepsy should avoid working with machinery.

Regarding management of epileptics during episode, 50.9, 20 and 20 percent of respondents indicated incorrect protocols: 1) placing an object in the mouth to prevent the tongue from being bitten, 2) restraining the patient and/or performing chest compressions and 3) giving AEDs during an episode, respectively. The present findings are consistent with studies by Kankirawatana[9] (1999), Dantas *et al* (2001)[10] and Fong *et al* (2002)[11].

Half of the presented respondents with experience of first-aid management of seizures used improper and potentially harmful measures and as Senanayake et al reported, 64% of respondents recommended placing a piece of wood in the mouth during a seizure[5]. Evidently, local lore and teaching are retained by medical students. In another of our studies – *conducted among school teachers in Khon Kaen* – it revealed that mean score of knowledge of epilepsy is only 50%[12]. Thus, the medical school must also publicly disseminate correct knowledge and first aid management of epilepsy.

Conclusion

The present study demonstrated that knowledge of epilepsy among the presented medical students was incomplete and pinpointed areas needing redress. The content of the fourth-year epilepsy lecture should emphasize the types of seizure, causes of epilepsy, consequences, general and acute management. The outcome would be both better knowledge and improved physician-patient relations. In an author study, the presented questionnaire should be administered to the same study group of students after attending the lecture to assess for the degree of improvement in their knowledge and practice vis-□-vis epilepsy.

Acknowledgment

The authors wish to thank Mr. Bryan Roderick Hamman for his assistance with the English-language presentation of the manuscript.

References

1. Mason C, Fenton GW, Jamieson M. Teaching medical students about epilepsy. Epilepsia 1990; 31: 95-100.
2. Santos IC, Guerreiro MM, Mata A, Guimaraes R, Fernandes L, Moreira F, et al. Public awareness and attitudes toward epilepsy in different social segments in Brazil. Arq Neuropsiquiatr 1998; 56: 32-8.
3. Teckle-Haimanot R. Public attitude towards epilepsy in rural Ethiopia. In: Neurological disorders in Ethiopia. A community-based study on pattern and prevalence. Umea: Umea University Medical Dissertation; No.291. 1990.
4. Levy LF. Epilepsy in Rhodesia, Zambia and Malawi. Afr J Med Sci 1970; 1: 291-303.
5. Senanayake N, Abeykoon P. Epilepsy in Sri Lanka: public awareness and attitudes. J Trop Med Hyg 1984; 87: 61-6.
6. Ismail H, Wright J, Rhodes P, Small N, Jacoby A. South Asians and epilepsy: exploring health experiences, needs and beliefs of communities in the north of England. Seizure 2005; 14: 497-503.
7. Shorvon SD. Precipitating causes and differential diagnosis of epilepsy. In: Hand book of epilepsy treatment. Oxford: Blackwell Science; 2000: 19.
8. Ab Rahman AF. Awareness and knowledge of epilepsy among students in a Malaysian university. Seizure 2005; 14: 593-6.
9. Kankirawatana P. Epilepsy awareness among school teachers in Thailand. Epilepsia 1999; 40: 497-501.
10. Dantas FG, Cariri GA, Cariri GA, Ribeiro Filho AR. Knowledge and attitudes toward epilepsy among primary, secondary and tertiary level teachers. Arq Neuropsiquiatr 2001; 59: 712-6.
11. Fong CY, Hung A. Public awareness, attitude, and understanding of epilepsy in Hong Kong Special Administrative Region, China. Epilepsia 2002; 43: 311-6.
12. Tiamkao S, Aaauevitchayapat N, Arunpongpaisal S, Chaiyakum A, Jitpimolmard S, Phuttharak W, et al. Knowledge of epilepsy among teachers in Khon Kaen Province, Thailand. J Med Assoc Thai 2005; 88: 1802-8.

ความรู้พื้นฐานเรื่องโรคลมชักของนักศึกษาแพทย์

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ความรู้ความสามารถทางวิทยาศาสตร์การแพทย์พื้นฐานในเรื่องประสาทวิทยาศาสตร์สำหรับนักศึกษาแพทย์อาจมีบางส่วนที่ไม่ครบถ้วนและกระจัดกระจาย การศึกษาครั้งนี้เพื่อเป็นการประเมินความรู้เกี่ยวกับโรคลมชักของนักศึกษา ก่อนที่จะมีการฟังบรรยายเรื่องโรคลมชัก ซึ่งจะทำให้ผู้สอนสามารถจัดเตรียมบทเรียนที่มีเนื้อหาสอดคล้องและเหมาะสมแก่ผู้เรียน โดยให้นักศึกษาแพทย์ชั้นปีที่ 4 จำนวน 110 คน ตอบแบบสอบถามเพื่อประเมินความรู้ในหัวข้อต่าง ๆ ผลการศึกษาพบว่า ร้อยละ 91.8 ทราบว่าการชักคือความผิดปกติของกระแสไฟฟ้าในสมอง ชนิดของการชักที่ทราบมากที่สุดคือ การชักชนิดเกร็งกระตุก และมีเพียงร้อยละ 33.6 ทราบการชักแบบนิ่งเหม่อลอย สาเหตุของโรคลมชัก นักศึกษาแพทย์ทุกคนทราบว่าไม่ได้เกิดจากการลงโทษของเทพเจ้าหรือการรับประทานเนื้อหมู แต่คิดว่าเกิดจากกรรมพันธุ์ร้อยละ 50 และไม่ทราบว่าภาวะหลอดเลือดสมองอุดตันและการอดนอนเป็นสาเหตุหนึ่งที่ทำให้เกิดอาการชักได้ร้อยละ 80.3 และ 92.7 ตามลำดับ ความรู้เกี่ยวกับการรักษาและการพยากรณ์โรค มีนักศึกษาแพทย์ เพียงร้อยละ 28.2 ที่ทราบว่าโรคลมชักสามารถรักษาให้หายขาดได้ ร้อยละ 48.2 เท่านั้นที่ทราบว่าควรรับประทานยากันชักต่อเนื่อง จนกระทั่งไม่มีอาการชักนาน 2-5 ปี และร้อยละ 33.6 คิดว่าต้องรับประทานยาตลอดชีวิต นักศึกษาแพทย์ทราบว่า ผู้ป่วยโรคลมชักไม่ควรขับรถ (ร้อยละ 80) ไม่ควรทำงานกับเครื่องจักร (ร้อยละ 74.5) มีเพียงร้อยละ 27.3 ที่ทราบว่าควรงดดื่มแอลกอฮอล์ แต่ทราบว่าผู้ป่วยสามารถแต่งงาน ตั้งครรภ์ และให้นมบุตรได้ร้อยละ 100, 98.2 และ 91.9 ตามลำดับ การดูแลผู้ป่วยขณะชักนักศึกษาแพทย์ร้อยละ 50.9 จะช่วยเหลือโดยการนำเอาวัสดุใส่เข้าไปในปากเพื่อป้องกันการกัดลิ้น และร้อยละ 20 จะกดหน้าอกผู้ป่วย เมื่อวิเคราะห์ผลของค่าคะแนนความรู้ที่ได้โดยเฉลี่ยมีค่า 29.6 คะแนนจากคะแนนเต็ม 50 คะแนน (ร้อยละ 60) ความรู้ที่มีค่าเฉลี่ยสูงสุดคือ ความหมายของโรคลมชัก (ร้อยละ 90.2) และที่ต่ำสุดคือ ชนิดของการชัก (ร้อยละ 43) จากผลการศึกษานำไปสู่การเตรียมเนื้อหาในการบรรยายโรคลมชักในชั้นคลินิกในประเด็นของการทบทวนพยาธิสรีรวิทยาของการชัก และเน้นในเรื่องชนิดของอาการชัก สาเหตุ ผลของโรค การพยากรณ์โรค และการดูแลผู้ป่วยเบื้องต้นขณะชักอย่างถูกวิธี