Misdiagnosis of Epilepsy Attributed to Inadequate History Taking

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Abstract

Background: There was a noticeable amount of patient with epilepsy who were misdiagnosed at Dr. Hasan Sadikin General Hospital. Misdiagnosis of epileptic seizure will expose patients to inappropriate managements, and subsequently leads to complications. History taking is an important part for the diagnosis of epileptic seizure. This study aimed to see the improvement of diagnosis based on the adequacy and inadequacy of history taking attributed to misdiagnosis of epileptic seizure by the epilepsy consultant at Dr. Hasan Sadikin General Hospital.
Methods: This was a descriptive study using medical records of misdiagnosis of epilepsy. It was indicated by different initial (before epilepsy consultant's confirmation) and final (after epilepsy consultant's confirmation) seizure diagnosis at Epilepsy Outpatient Clinic at Dr. Hasan Sadikin General Hospital during the period of January 2007–October 2012.
Results: There were 61 medical records with different initial and final seizure diagnosis. This study indicated inadequate history taking in 83.6% patients. Misdiagnosis occurred due to incomplete history taking, absence of reliable witnesses, and misinterpretation of history taking result. History taking by epilepsy consultant improved the misdiagnosis in 27.9% patients. While it is used simultaneously with Electroencephalography (EEG), the result increased to 72.2%.
Conclusions: The adequate history taking improved the accuracy of epileptic seizure diagnosis. The simultaneous used of history taking and EEG increased the result. **[AMJ.2016;3(2):304–9]**

Keywords: EEG, epileptic seizure diagnosis, history taking.

Introduction

Epilepsy is one of the world's most common neurological diseases. Incidence of epilepsy in developing countries reached 114 per 100,000 population per year.[1] Consequently, the number of people living with epilepsy in Indonesia is estimated to rise to 250,000 each year.[2]

Epilepsy is a condition characterized by repeated epileptic seizure that occurs without provocation.[3] Diagnosis of epilepsy consists of 3 steps; recognizing a paroxysmal event as an epileptic seizure, differentiating type of epileptic seizure according to International League Against Epilepsy (ILAE) 1981 classification, and later, determining epileptic syndrome according to ILAE 1989 classification.[2] Each step is prone to misdiagnosis. Diagnosis of epileptic seizure is primarily a clinical one,[4] in 90% cases, information obtained from history taking alone is enough to diagnose epilepsy and determine the type of epileptic seizure.[5] A complete and accurate history taking is not always easy and poses a great challenge to general physicians. Although there is a guideline from Indonesian Neurology Association 2011 for history taking in epilepsy, human error or absence of reliable witness make inadequate history taking inevitable. Interpretation of information obtained from the history taking itself is also challenging. Electroencephalography (EEG), despite of its importance, could not always be obtained. In addition, EEG in people with epilepsy does not always show abnormality,[6] so it cannot be used as a sole basis for epilepsy diagnosis.

Mistakes in history taking is the major cause of epilepsy misdiagnosis.[7] Misdiagnosis rate in the United Kingdom is high, around 16.3%

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to 41.9%.[4], 7-10 Misdiagnosis of epilepsy and epileptic seizure gives a big impact to the patients, such as continuing seizure, side effects of unnecessary medication, ban of getting driving license, and employment difficulties.[7] In a broader scope, epilepsy and epileptic seizure misdiagnosis is a major obstacle in the prevention of epilepsy.[2] This study aimed to seethe improvement of diagnosis based on the adequacy and inadequacy of history taking attributed to misdiagnosis of epileptic seizure by the epilepsy consultant at Dr. Hasan Sadikin General Hospital Bandung.

Methods

This study was a descriptive case series study conducted at Epilepsy Outpatient Clinic at Dr. Hasan Sadikin General Hospital during the period of September–October 2012. The subjects were selected from the medical records of epilepsy patients from outpatient clinic at Dr. Hasan Sadikin General Hospital Bandung. Inclusion criteria for this study were medical records of misdiagnosis of epilepsy indicated by difference in initial (before history taking by epilepsy consultant and/or supportive investigations) and final seizure diagnosis by further history taking done by an epilepsy consultant and/or further investigations (EEG, imaging, lab test). History taking by epilepsy consultant was in accordance with guideline of Epilepsy by Indonesian Neurology Association 2011.[2] Exclusion criteria were the medical records containing no obvious reasons upon changing the diagnosis. There were 93 medical records with different initial and final diagnosis. Thirty two data were missing and 61 met the inclusion criteria and none of them has the exclusion criteria

When the patients first came to epilepsy outpatient clinic, they were seen by neurology residents who make an initial diagnosis with or without EEG result. The patients then were consulted to an epilepsy consultant for diagnosis confirmation and therapy planning. Epilepsy consultant assesses the patient by history taking and/or asked for further investigations and established a final diagnosis. In order to achieve the objective of this research, this study recorded initial and final diagnosis, inadequacies in history taking made by neurology resident, and investigation used in establishing final diagnosis (history taking by epilepsy consultant alone or with further investigations). In addition, these inadequacies in history taking were then used to compile a history taking question list to improve future epileptic seizure diagnosis accuracy. Statistical analysis was analyzed by computer.

Results

Median age of subjects was 28 years old, ranging from 14–72 years old. The number of female was more than male (59.1% to 40.9%) (Figure 1).

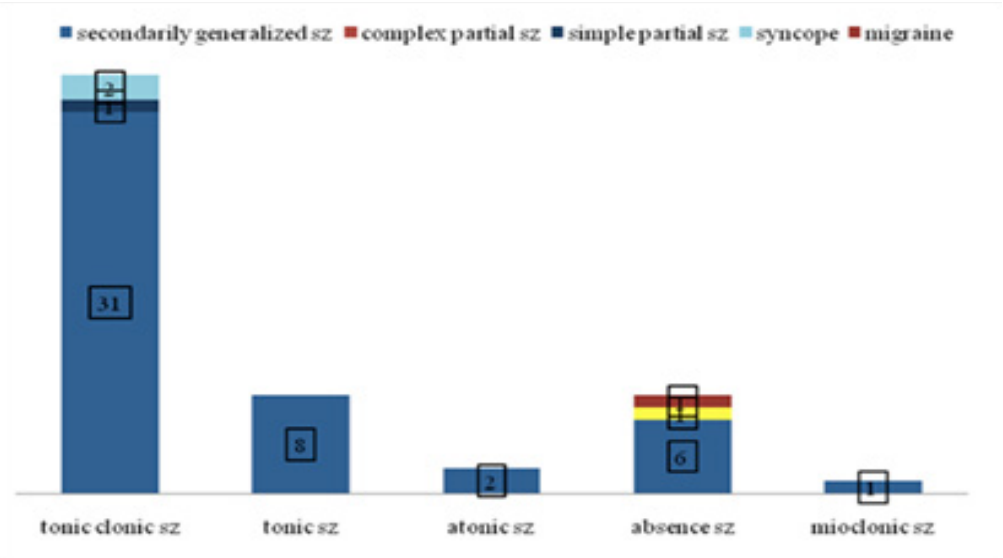

Figure 1 Final Diagnosis in Patients Initially Diagnosed as Having Generalized Seizure

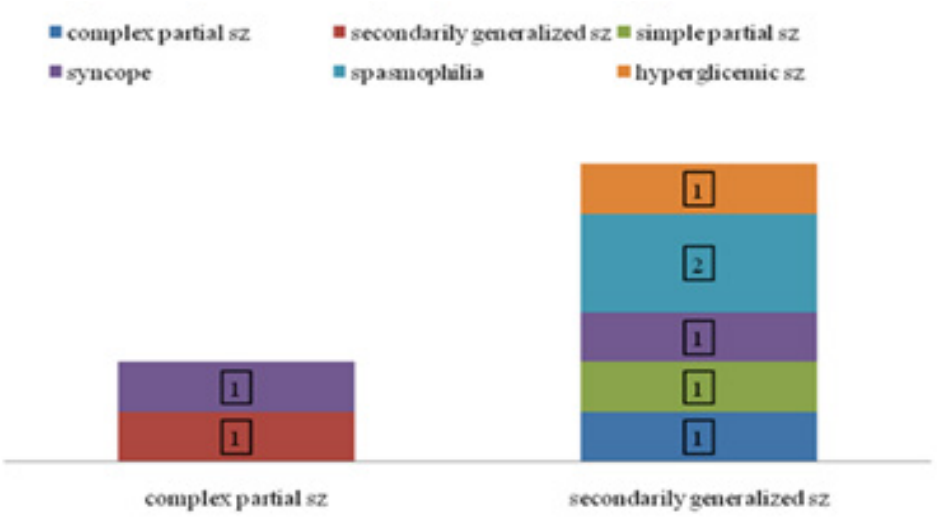

Figure 2 Final Diagnosis in Patients Initially Diagnosed as Having Partial Seizure

As presented in Figure 1, from 61 patients, 53 were initially misdiagnosed as having generalized seizure, 49 were finally diagnosed as having partial seizure, while the remaining 4 were finally diagnosed as having non-epileptic seizure.

Figure 2 showed 8 patients were initially misdiagnosed as having partial seizure, 3 were finally diagnosed as having another type of partial seizure and the remaining 5 were diagnosed as having non-epileptic seizure. Non-epileptic seizures initially misdiagnosed as epilepsy are syncope, narcolepsy, migraine, spasmophilia, and hyperglycemic seizure.

Most of the subjects were initially diagnosed with history taking. From 11 subjects diagnosed after EEG exam, misdiagnosis occurred because the clinicians carrying out the diagnosis neglected the EEG expertise (Table 1).

Further history taking by an epilepsy consultant contributed to diagnosis improvement in 83.6% of patients, while for the remaining subjects, diagnosis were made on the basis of EEG result with or without laboratory test(s) (Table 2).

Mistakes occurred in history taking were incomplete history taking, absence of reliable witness, and misinterpretation of history taking.

History taking inadequacies that was found was history taking without reliable witness (27.5%), incomplete history taking (27.5%), absence of aura information (25.5%), and misinterpretation of history taking (19.5%) (Table 3). History taking without reliable witness happened when patients came alone, patients came with a person who never witnessed the seizure or did witness but gave wrong information. Questions not asked in incomplete history taking were related to patient's level of consciousness, focal symptoms, sequence of symptoms, postictal confusion, accompanying symptoms, circadian rhythm of seizure, and presence of seizure trigger factors. Meanwhile, misinterpretation of history taking was characterized by patients with adversive symptoms but diagnosed with generalized seizure, patients with aura but diagnosed with generalized seizure, patients without loss of consciousness but diagnosed as secondarily generalized seizure, patients

Table 1 Investigations Used in Initial Diagnosis

Investigations	Frequency	Percentage
History taking	50	82.0
History taking and EEG	11	18.0

Table 2 Investigations that Improve Diagnosis

Investigations	Frequency	Percentage
Further history taking and EEG	27	44.3
Further history taking alone	17	27.9
Further history taking, EEG, MRI	5	8.2
Further history taking , EEG, MRI, ECG	1	1.6
Further history taking , blood calcium level	1	1.6
EEG only	9	14.8
EEG and random blood glucose	1	1.6

with loss of consciousness but diagnosed as partial complex seizure, and patients without convulsion but diagnosed as partial complex seizure.

This study compiled a list of questions essential to differentiate epilepsy from non-epileptic seizure and determine it into several types: 1) was there anything felt before the seizure or the patient know that seizure was about to happen?; 2) were there any unnoticed symptoms before seizure (such as eye blinking/ gasping)?; 3) in the beginning of the seizure, was the position of the head straight or did it turned to one side?; 4) did the seizure always start from one part/side of extremity(ies)?; 5) how long was the duration of seizure?; 6) how often and in what circumstances did the seizure happen? Was there any trigger factor for the seizure?; 7) did the patient loss consciousness during the seizure?; 8) did the patient fully conscious after the seizure? Were there any symptoms after seizure (such as nausea or eye blinking)?; 9) what was the sequence of events during the seizure?

Discussion

In this study, the majority of patients initially diagnosed as having generalized seizure were finally diagnosed as having partial seizure. This result was in line with literature stating that adult-onset epilepsy is rarely a generalized seizure.[6,11] Non-epileptic seizure most often misdiagnosed as epilepsy was syncope. This result is not in accordance with a research carried out by Benbadis[12] suggesting that psychogenic seizure is the most common disease misdiagnosed as epilepsy in tertiary care center, syncope places number two. In contrast, Scheepers et al. and Zaidi et al.[10] suggest that syncope is the most common medical condition misdiagnosed as epilepsy. Other non-epileptic seizure misdiagnosed as epilepsy in this research were quite different with findings in the previous study.[7]

History taking inadequacies occurred in 83.6% of patients with different initial and final diagnosis. This result is in concordance with a research in England[7] stating that history taking inadequacies are the main cause of misdiagnosis. Most patients were initially diagnosed based on history taking, this is in line with a research carried out by Ferrie[13] in England stating that misdiagnosis in epilepsy can be caused by diagnosis based on history taking only, without confirmatory investigations. Research by Anderson and Smith[14] also confirm this finding by stating that epilepsy misdiagnosis is primarily caused by history taking and examination inadequacies and premature diagnosis.

Investigations needed to improve misdiagnosis were further history taking by epilepsy consultant, EEG, MRI, ECG, and laboratory tests. This is quite similar with the methods that some researchers used to detect misdiagnoses in previous published researches.[4,7,9,10]

Table 3 Inadequacies in History Taking

History taking inadequacies	Frequency	Percentage
History taking without reliable witness	14	27.5
Incomplete history taking	14	27.5
Absence of aura information	13	25.5
Misinterpretation of history taking	10	19.5

History taking inadequacies found in this research were history taking without reliable witness, incomplete history taking, absence of aura information, and misinterpretation of history taking. This finding is in concordance with previous research by Smith et al.[7] suggesting that misdiagnosis occurred because of history taking without reliable witness, misinterpretation of motoric signs, and inadequate history of past medical and psychiatric illness. This result is also supported by Bromfield et al.[15] who suggested that patient's and witness' memory regarding aura and focal symptoms is very important.

Questions that this study compiled are important in differentiating epileptic seizure from non-epileptic one and differentiate each type of epileptic seizure. Questions regarding frequency and duration of seizure are essentially important in differentiating epilepsy and spasmophilia and absence and partial complex seizure.[6,11] Questions regarding sequence of symptoms during seizure are important in differentiating epilepsy from syncope. Questions regarding aura, focal symptoms, head turning, patient's consciousness, and postictal symptoms are important in differentiating generalized seizure from partial one.[6]

In conclusion, this study showed that adequate history taking improved accuracy of epileptic seizure diagnosis. Adequate history taking has to be a combination of autoanamnesis and alloanamnesis from reliable witness and includes questions regarding auras, focal signs, accompanying symptoms, patients' consciousness, and sequence of symptoms during seizure. The EEG increased the yield of epileptic seizure diagnosis improvement.

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