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Necessary Application of the Clinical Method in Epilepsy

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Abstract

Mention is made of the clinical method and its origin in the School of Cos, in ancient Greece, by Hippocrates. It describes what the method consisted of and how it is influenced by the complementary studies that were introduced as support to medical sciences. Currently, this method is considered the scientific method of clinical science and the importance of its use in epilepsy is discussed. The aspects to consider when we are faced with a patient with the suspicion or diagnosis of this disease, which is considered a global health problem, are described. The epidemiological factors that are part of epilepsy are described and therefore the importance of an accurate diagnosis, through the clinical method and therefore with a clinical history with the elements inherent to it, which may imply a comprehensive management of the patient in an attempt to minimize the devastating aspects of this disease. The clinical method in epilepsy involves, in conclusion, a multifactorial analysis that includes the considerations described, making evident the importance of the questioning about the physical examination, without failing to take into account the complementary investigations and, of course, the differential diagnosis.

Keywords: Epilepsy; Clinical method; Clinical history; Differential diagnosis

Introduction

It is known that the clinical method was founded by Hippocrates (460-376 BC), in the School of Cos, in ancient Jonica Greece of Asia Minor. The Greeks were the first to use the word "clinic", which is derived from the Greek "klinikos", meaning bed; hence the relationship between the clinic and the medical art, which prescribed rules for healing at the bedside of the patient [1,2].

Hippocrates and the members of his School gave great importance to the observation by the doctor of his patient; they questioned the patient and his relatives, very carefully and carefully; they inspected him, proceeded to palpate him and touch any part of the body and even directly auscultated the thorax if necessary; they visited him at different times of the day and made a record of what they were finding and doing [3].

At that time, the clinical method consisted of: formulation (the patient told his health complaints), information (the doctor questioned and examined), hypothesis (the doctor gave his diagnosis) and in some cases a debatable and nebulous verification, by means of treatment. In relation to this, Hippocrates said very rightly: "Observation, anamnesis, examination, analysis, is therefore necessary, is indispensable, all of which must be done with a rigorous regime of thorough examination, in order to strengthen your ever-increasing experience." This method was maintained for more than 17 centuries [2,3].

The development of the first complementary tests began in the second half of the 19th century, considered the century of the clinic. It gave way to the era of the clinical laboratory, which lasted for more than a century, where the analyses were done by the same doctors and technicians and improved the possibilities of diagnosis [1].

The clinical method would continue to be made up of the five steps: Formulation; Information; Presumptive diagnostic hypothesis; Contrast and finally, Verification or not of the presumptive hypotheses. Of course, it cannot be ignored that, in recent decades, many of these steps have been eclipsed by imaging and neurophysiological studies, incorporated into medical practice, thus ignoring clinical diagnosis, which can never be replaced by the development of technology. If we add to the above the little interest by medical personnel in giving time and attention to the patient, we would not achieve adequate management of any disease and especially epilepsy [1].

Currently, the clinical method is considered the scientific method of clinical science, which has as its objective the study of the health-disease process. Any medical practice that is not based on the clinical method will be alien to clinical science and, to a large extent, responsible for "bad medical practice" [4]. For some, the clinical method is nothing more than the scientific method applied to working with patients.

Taking these considerations into account, we must emphasize that if in any entity the application of the clinical method is important, it is in Epilepsy, which is considered by many to be one of the most difficult in terms of comprehensive management of the medical specialties, due to the complexity involved in the affections of the nervous system, through the relationship with neuroanatomy, neurophysiology and neuropathology [5].

In turn, this disease constitutes a challenge for the physician, since the diagnosis is closely related to the symptoms that the patient describes, without underestimating the support of complementary research.

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The importance of the clinical history, as an essential part of the traditional clinical method, is widely recognized in all fields of medicine, and is even more important when the existence of epilepsy is suspected [1].

For this reason, we propose in this context to describe from an academic point of view, the aspects to consider when we are faced with a patient with suspected or diagnosed epilepsy, in order to insist on the need to apply the clinical method, guide him/her appropriately and try to minimize the devastating aspects of this disease.

To prepare it, the Google Scholar search engine and the descriptors epilepsy, clinical method and positive and differential diagnosis were used. The Medline, Scielo, Scopus and Medscape databases were used.

Epilepsy as a World Health Problem

Epilepsy is a global public health problem that requires an adequate response [6,7].

It is a clinical condition considered by most authors as the second neurological disease that affects between 50 and 69 million people of all ages, races, social classes and regions of the world, according to reports from the World Health Organization (WHO), estimating that [8] it affects 1 to 2% of the world's population [9,10].

Some authors consider that between 68 and 84% of people with epilepsy can live without epileptic seizures, if they are diagnosed and treated appropriately, but for the vast majority of patients this is not the case [11,12].

If we take into account that around five million new cases are reported in the world each year, we can understand that we are facing an entity that deserves attention. The annual incidence of unprovoked seizures is 33-198 per 100,000 population/year, and the incidence of epilepsy is 23-190 per 100,000 population/year [6].

The overall incidence of epilepsy in Europe and North America ranges from 24 to 53 per 100,000 person/year, respectively, which is consistent with Hauser's reports. The incidence in children is higher and even more variable, from 25 to 840 per 100,000 per year, most of the differences being explained by the diverse populations at risk and by the study design [13].

The global prevalence of epilepsy varies from 2.7 to 41 per 1000 inhabitants, although in most reports the rate of active epilepsy is in the range of 4-8 per 1000 inhabitants [14,15].

There are studies in the world population that show that the prevalence of epilepsy is between 1.5 and 30 cases per thousand inhabitants.

In another aspect, it is considered that patients with epilepsy have a risk of mortality three times greater than the general population. A key element that explains this risk among others, is the lack of control of epileptic seizures, since patients are at risk of suffering trauma, fractures, burns and psychosocial morbidities, such as depression, anxiety and even the possibility of suicide [16].

The psychological, social and community impact on patients who suffer from it is significant, as they are among the most vulnerable in any society, related to the particular stigma that this disease carries with it, which has been transmitted through generations for millennia. People with epilepsy experience discriminatory behavior in many areas of life, with associated comorbidity, all of which implies that it is considered a complex pathology, with social, psycho-biological and even economic consequences [17].

For all these reasons, it is essential to have a comprehensive management of the patient with this disease and to take into account possible prevention measures, thus avoiding the possibility of complications, considering lifestyle changes and the appropriate use of anti-seizure medication [18].

It is necessary to take into consideration the relevant aspects of a patient with suspected epilepsy, and it is in Primary Health Care (PHC) where it is necessary to insist with emphasis, since there are many questions; but the most important is the definition of whether one is dealing with a patient with an epileptic-type cerebral seizure or not [19,20].

Only with an adequate interrogation can a positive diagnosis be achieved, even if we can rely on the necessary means. But if time is not spent investigating the patient's history, an appropriate criterion is not achieved [19].

Awareness that one is facing a health problem that requires an adequate response implies a correct control of the disease and that preventable deaths due to this concept are avoided [8].

Concerns with A Patient with Suspected Epilepsy [19].

There are multiple questions that the doctor experiences when faced with a patient with a suspected diagnosis of epilepsy, but the most important are the following [19]:

- Are we in front of a patient with epilepsy?
- What type of seizure / epilepsy does the patient have?
- What is the etiology of epilepsy?
- What therapeutic behavior should we follow?

One of the most difficult dilemmas faced by physicians in medical practice is trying to determine whether a patient has this disease or not.

When we suspect an epileptic seizure, we must try to answer a series of diagnostic questions that such a situation poses. To answer the first question and decide whether a clinical episode is suggestive of an epileptic seizure, the diagnostic method of choice is the clinical history [19].

This disease has had various meanings and concepts, but for the purposes of this review, we will refer to the latest. The International League Against Epilepsy (ILAE) and the World Health Organization (WHO) since 1973 defined Epilepsy as a chronic and recurrent condition of paroxysmal crises (epileptic seizures), triggered by abnormal electrical discharges that have varied clinical manifestations of multifactorial origin and that are associated with paraclinical disorders (electroencephalographic abnormalities) that occur in an unprovoked manner [21].

Thirty years later, the conceptual definition of seizures and epilepsy according to the 2005 report of the International League Against Epilepsy (ILAE) working group specifies that an "epileptic

seizure" is the transient appearance of signs and/or symptoms caused by excessive or simultaneous abnormal neuronal activity in the brain and that epilepsy is a brain disorder characterized by a continued predisposition to the appearance of epileptic seizures and by the neurobiological, cognitive, psychological and social consequences of this disease. The definition of epilepsy requires the presence of at least one epileptic seizure [20,22].

More recently, in 2014, a group of ILAE experts, with the consensus of epileptologists from the different chapters, published the operational (practical) clinical definition of epilepsy:

Epilepsy is generally considered to be a brain disease defined by any of the following:

- At least two unprovoked (or reflex) seizures >24 hours apart.
- One unprovoked (or reflex) seizure and a probability of further seizures occurring within the next 10 years similar to the general risk of recurrence (at least 60%) after the occurrence of two unprovoked seizures.
- Diagnosis of an epilepsy syndrome [23].

According to these criteria, epilepsy is present in a patient who has had a seizure and whose brain, for whatever reason, shows a pathological and continued tendency to suffer recurrent seizures. This tendency can be imagined as a pathological reduction of the seizure threshold compared to people who do not have the disease [20,24].

Taking into account the definitions described above, the differentiation of epileptic seizures and pseudoseizures is of significant importance because [20,25]:

- There may be a failure to recognize and therefore not start treatment for the true pathology.
- The error in diagnosing epilepsy may lead to: consequent social stigma.
- And the unnecessary risk of using anti-seizure medication may lead to various unnecessary adverse reactions.

In the Positive Diagnosis of Epilepsy, The Following Elements Must be Taken into Account [10]:

- History of seizures
- General physical and neurological examination
- Complementary investigations

Angus-Leppan conducted an original study on the comparative diagnostic contribution between the clinical history, the neurological examination and complementary tests in 158 patients with possible epileptic seizures referred to a hospital clinic [1].

This author observed that a neurologist with special dedication to epilepsy was able to reach a diagnosis in 87.3% of them: 43% of epilepsy, 25.3% of syncope and 19% of other non-epileptic episodes. The most remarkable thing was that in practically all these cases the diagnosis was reached with the exclusive contribution of the clinical history [26].

The primacy of this diagnostic method was also evident in another study carried out in a reference hospital, which found that 26% of patients arrived with an erroneous diagnosis of epilepsy, and that the main reason for this was an incomplete clinical history [27].

Similar findings were found in a population study, which highlighted the importance of both an accurate clinical history and sufficient knowledge of the disease [28].

We agree with these studies, which we have corroborated in our professional practice.

In our consideration, the interrogation with an adequate schedule of the seizures reported by the patient and the family member is of relevant importance and is the greatest bulwark available to the physician to distinguish between an epileptic seizure and one of another type [10].

The first clinical symptoms frequently provide the most information regarding the zone of ictal and epileptogenic initiation as the initial symptomatogenic zone [29].

In addition to the semiological characteristics of the crisis, which include perceptual symptoms at the beginning and, if possible, during the episodes, the possibility of behavioral changes and associated diseases, such as loss of muscle tone, alterations in the state of consciousness and breathing, should be included in the questioning [20].

The appropriate questioning depends on whether it is possible to define which neurological and non-neurological alterations can be confused with epilepsy [20].

The Clinical History should Include [20,30]:

- Circumstances in which the paroxysmal events occurred (were initiated) details (clinical elements) of the paroxysmal events (not only the most dramatic ones), as they have been experienced by the patient and relatives/witnesses.
- Time and circadian distribution
- Position (standing, sitting or lying down)
- Circumstances (at rest or during exercise)
- Postictal clinical elements
- Possible activation: precipitating or facilitating factors
- Personal and family medical history.

Circadian distribution (upon awakening, nocturnal and diurnal) and precipitating factors (blinking in relation to lights, sleep deprivation, alcohol indulgence, stress and reading) often provide very valuable details for the correct diagnosis and can also lead to the appropriate procedure for the complementary studies to be performed [20].

In this regard, the clinical history can be considered the method of choice for the diagnosis of the epileptic nature of a clinical episode [1].

The physician must take into consideration that non-epileptic paroxysmal events are frequently found in neurological practice,

mainly in pediatrics and can be misdiagnosed as epileptic seizures. In children the percentage can vary from 20-25% [20,31].

Correct diagnosis is important, since these do not require anti-seizure medication, and may also be due to another etiology that -when not identified- does not receive adequate therapy. It is sometimes more difficult to define the type of crisis, since these events can also be associated with epileptic seizures and both etiologies may coincide in the same patient and be a cause attributable to failure in anti-seizures medications [20,32].

Among these, psychogenic non-epileptic seizures are of significant importance, in which most studies document that the prevalence occurs in seizure monitoring units. It is considered that approximately 20-40% of patients admitted for evaluation are diagnosed with psychogenic seizures [20,33].

Although it is Certain That These are Epileptic Seizures, There are Important Characteristics to Take into Account in their History

- First seizure event. Clinical features (aura, initial movement, or sensory disturbance described), date, and circumstances.
- Subsequent course of the event
- Postictal manifestation [focal (e.g., Todd paresis/palsy) vs. nonspecific diffuse]
- Is there more than one type of seizure?
- Has there been a change in the seizure pattern?
- Precipitating or triggering factors (alcohol, lack of sleep, hormonal)
- Age of onset, mean seizure frequency, and seizure-free interval
- Response to medication (dose, blood levels, drug combinations)
- Family history (parents, children, siblings)
- History of neonatal epileptic seizures or febrile convulsions
- Is there a history of previous brain injury?
- Is there a family or personal history of other neurological, mental, or systemic disease?

General and Neurological Physical Examination

The neurological examination should take into account the time interval between the last epileptic seizure, specifying elements such as Todd's hemiparesis, transient aphasic symptoms, which should be separated from postictal confusion. The main objective is to determine whether the symptoms or signs are permanent. In the interictal period, the examination may be normal in most patients [10,20].

The general examination should include examination of the skin, vision and eyes, as well as visceral examination (cardiovascular: arrhythmias), in addition to a brief Cognitive, Social and Behavioral Functioning Assessment [10,20].

Complementary Investigations

Laboratory procedures [blood and urine, Electrocardiogram (ECG), Electroencephalogram (EEG), brain imaging and others such as metabolic studies or toxicological investigations, serum monitoring of Anticonvulsant medication (AED), analysis of Cerebrospinal Fluid (CSF) and molecular genetic tests] should be conveniently prioritized and adapted to the patient's clinical picture [10,20].

The Electroencephalogram (EEG) is the most significant investigation in the diagnosis of epilepsies, and is often misinterpreted and indicated. It is a valuable instrument for the epileptologist in the topography of the different epileptic syndromes and has precise indication in the different conditions in which graphoelements may be present, with great semiological and prognostic value. Sleep studies, with sleep deprivation and induction, nap studies, and video-EEG monitoring can be performed, the latter being very useful in the precision of seizure semiology and the diagnostic disquisition of non-epileptic type cerebral seizures [20].

Imaging is another invaluable diagnostic procedure, which provides in vivo visualization of the structural causes of epilepsy such as hippocampal sclerosis, development of malformations and brain tumors, as well as other brain diseases [Computed Tomography and Magnetic Resonance (MRI), MRI with spectroscopy and functional, Positron Emission Tomography, Single Photon Emission Tomography] [20].

Genetic testing has become an available means for a growing number of hereditary disorders associated with epileptic seizures. Its use in the indicated cases is of invaluable diagnostic and therefore prognostic value.

Differential Diagnosis

In the differential diagnosis of transient events, it is not only necessary to specify that they are epileptic seizures, but also to distinguish between provoked epileptic seizures and a chronic epileptic condition [10,20].

Misdiagnosis in epilepsy is a colossal medical problem, considering its dimensions and consequences. Common disorders and even normal phenomena can mimic epileptic seizures and, conversely, certain types of epileptic seizures can mimic the symptoms of other diseases [20]. Misdiagnosis has serious repercussions. Patients with non-epileptic disorders who are incorrectly diagnosed as having epileptic seizures are susceptible to being mistreated with Anti-Seizure Medication (ASM). Similarly, patients with epileptic seizures misdiagnosed as psychogenic seizures [11], migraine, encephalitis, or other pathologies are likely to be managed with inappropriate treatments and also deprived of specific therapies [23].

Differential diagnosis includes all causes of episodic impairment of consciousness, aberrations of mental function, falls, sensory/motor phenomena, and generalized convulsive movements, which are common presenting symptoms of epileptic seizures [20,34]. Febrile seizures in infants and young children and seizures in alcoholics due to withdrawal are common examples of provoked seizure events that do not require a diagnosis of epilepsy. If seizures are recurrent, it is necessary to search for an underlying treatable cause [20,35].

The International League Against Epilepsy (ILAE) Defines Epileptic Seizure Mimics as [36]:

- Clinical manifestations unrelated to abnormal and excessive firing of a number of brain neurons, including:

- Disturbances in brain function (vertigo or dizziness, syncope, sleep and movement disorders, transient global amnesia, migraine, enuresis); and

- Pseudoseizures (sudden non-epileptic episodes of behavior presumed to be psychogenic in origin; these may coexist with certain epileptic seizures).

- An inadequate history is the most frequent cause of misdiagnosis.

In the mind of the physician who questions the patient [20,37,38], the differential diagnosis should prevail, which may include the following conditions: simple crisis, syncope, drop attacks, cerebrovascular disease, migraine, cardiac arrhythmia, sleep disorders, encephalopathy/dementia, acute elevation of intracranial pressure, vestibular disorders, toxic and metabolic disorders, involuntary movements, psychiatric disorders, sensory disorders, visual and auditory symptoms, autonomic disorders, neonatal conditions, tonic crises in multiple sclerosis, parasitism and digestive disorders. All these causes can be included in the diagnosis of recurrent cerebral crises (hypoxic, toxic, psychic crisis and sleep disorders) [20,32].

We must also keep in mind the Classification of phenomena that appear to be epileptic seizures, but are not (which are classified by the mechanism that causes them) and it is another way of differentiating these episodes [31,39].

Physiological: A. Cardiovascular mechanisms, B. Movement disorders, C. Migraine and its variants, D. Sleep disorders.

Psychogenic: A. Psychogenic crises (of psychological cause), B. Panic attacks, C. Somatoform disorders (simulate real crises), D. Psychotic disorders (loss of reality).

Cardiovascular mechanisms: A) Cyanotic sobbing spasm, B) Pale sobbing spasm, C) Syncope.

Movement disorders: A) Neonatal tremors, B) Benign myoclonus of infancy, C) Hyperplexia, D) Paroxysmal dystonic disorders with choreoathetosis, E) Paroxysmal ataxia, F) Tics.

Migraine and its variants.

Sleep disorders: A) Night terrors, B) Sleepwalking, C) Nightmares.

All of the above shows that the differential diagnosis of cerebral seizures is very diverse and the importance of questioning must be kept in mind, in order to try to define the nature of the event that we are analyzing.

It is necessary not to consider an epileptic seizure as a non-epileptic paroxysmal event, nor this as a seizure event, but for this, the clinical method must be taken into account as in any other pathology [1,20].

Studies on the diagnosis and treatment of epilepsy are a priority topic of research for neurosciences.

In the differential diagnosis of cerebral seizures, the importance of questioning must be kept in mind, in order to try to define the nature of the event that we are analyzing, not to introduce anti-seizure medication unnecessarily, avoiding possible adverse reactions and adequately managing the various possible etiologies [20,40].

In conclusion, we can state that the clinical method in epilepsy therefore involves a multifactorial analysis that includes the considerations described, making clear the importance of questioning during the physical examination, without forgetting to take into account complementary investigations and, of course, the differential diagnosis.

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