Gastroenterological Masks of Partial Epilepsy in Clinical Practice: A Case Example

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Abstract

The purpose of this paper is to focus gastroenterologist’s attention and underline the necessity to conduct detailed differential diagnosis in patients with dyspepsia syndrome. This paper shows a clinical case of abdominal form of the partial epilepsy. We have focused on the medical history; therefore, this disease has been suspected, further electroencephalography and neurologist’s consultation were recommended in order to correct treatment. Partial epilepsy has to be included into the list of differential diagnosis in dyspepsia. Gastroenterologists and other internal medicine practitioners should be familiar with different clinical types of epilepsy and symptoms of partial epilepsy, as well as with the features of its medical treatment for early diagnosis and better outcomes in patients with epilepsy. It is necessary to collect detailed medical history and refer to neurologist patients with dyspepsia and a history of head injury, participation in combat sports, football or any severe infectious diseases with an intoxication syndrome. Early diagnosis of somatic masks of the partial epilepsy will allow predicting unexpected secondarily generalized seizures, since these somatic masks, according to their nature, actually are auras of the possible tonic and clonic seizures.

Keywords: Dyspepsia; Differential Diagnosis; Partial Epilepsy

Introduction

The future of modern gastroenterology, in our opinion, is inextricably linked with a significant interdisciplinary integration of existing scientific and clinical knowledge. Gastroenterology as science and practice require a wide range of medical knowledge and views. Often the gastroenterologist becomes a key figure who establishes the mental or neurological origin of the patient’s complaints that firstly was consulted by an otolaryngologist, allergist, or dermatologist, etc. Functional dyspepsia is a glaring example of the connection between the manifestations of gastroenterological symptoms and the imbalance of the neurotransmitter system in the brain.

Dyspepsia is the most common syndrome in gastroenterological practice. In general, the prevalence of uninvestigated dyspepsia (UD) in the world varies between 7 and 45%, depending on the diagnosis and certain geographical features of the population of a country, while the prevalence of functional dyspepsia (FD) is between 11 and 29.2% [1].

Currently in Ukraine, the prevalence of FD reaches 30 - 40% [2]. Systematic surveys show that about 20% of the world’s population have symptoms of dyspepsia. Dyspepsia is more common among women, smokers, and those who take nonsteroidal anti-inflammatory drugs on a regular basis. FD does not affect the life expectancy of patients, but its symptoms negatively affect the quality of life of the population and cause economic damage to the health sector of each country [3]. The symptoms of dyspepsia are nonspecific and can accompany many diseases that are diverse in nature [4].

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Clinically, dyspepsia is defined as the presence of predominant epigastric pain lasting at least 1 month, which may be associated with symptoms of upper gastrointestinal lesions such as postprandial fullness, nausea, vomiting. However, the pain syndrome in the epigastrium is leading, because it prompted the patient to come to the doctor. FD is diagnosed in patients who have already undergone a number of diagnostic studies and ruled out any organic pathology that could cause existing symptoms [3]. According to Rome Criteria IV (2016), FD is a set of disorders that includes pain and a feeling of early satiety and fullness in the epigastrium after eating and observed in the for the last 3 months with symptom onset at least 6 months before diagnosis in case of exclusion of structural disease (including at upper endoscopy) that is likely to explain the symptoms.

The national guidelines clearly separate the criteria for the differential diagnosis of dyspepsia with gastroesophageal reflux disease, IBS, aerophagia and functional vomiting. There are also clear recommendations for dyspepsia treatment by the drugs of the first (proton pump inhibitors, prokinetics) [2] and second lines (tricyclic antidepressants) [3].

Meanwhile, there is no information in the available clinical guidelines regarding possible link between dyspepsia symptoms with such a common neurological disease as epilepsy, in particular its partial (focal) form.

Epilepsy is also one of the most common neurological diseases, which in the middle of the last century was considered incurable, progressive and leading to profound dementia. Today epilepsy has undergone significant changes in its course and consequences, in the impact on the overall health of patients and their socio-demographic status. However, despite significant scientific advances in recent decades, epilepsy remains a significant medical and social problem. It is considered the most common serious chronic neurological disease and the second most common neurological pathology after headache. According to the latest data, there are between 65 and 70 million patients suffer from epilepsy in the world [5].

Recently, there is some evidence about connection between FD with impaired pain perception, increased response to pain stimuli as a result of increased release of the neurotransmitter glutamate at the synapse level in the central sensory areas, activation through pain pathways of the spinal cord of those pain receptors that were not previously involved. Moreover, the patients with FD have abnormal regional brain activity. Changes in the perception of information coming from the gastrointestinal tract testify to the "interest" of the central nervous system in the etiopathogenesis of PD. It is believed that in the formation of visceral hypersensitivity of the gastric wall to stretching there is a violation of the transmission of impulses to the central nervous system in the form of increasing their frequency, increasing the normal impulse during the passage of spinal cord structures or strengthening them in the brain [4].

Glutamate and gamma-aminobutyric acid are neurotransmitters that have been extensively studied in epilepsy. They play a leading role in the development of epilepsy and it was confirmed that the disruption of the relationship in the brain between these two neurotransmitter systems contributes to the increased excitability of the brain and the development of epilepsy [5]. Glutamate is a leading excitatory neurotransmitter in the brain, which is responsible for generating excitatory postsynaptic potential by depolarizing neurons [6].

Thus, the crossover or so-called overlap of possible pathogenetic mechanisms of development of both functional dyspepsia and epilepsy (glutamate mechanism) is likely to contribute to diagnostic errors during treatment and diagnosis of a patient admitted to the hospital with pain syndrome of a certain location.

There is lack of data in international and national guidelines about management of patients with dyspepsia in whom instrumental diagnostic methods ruled out the presence of any organic pathology or the response to both proposed lines of therapy was not successful, as in the following clinical case.
Clinical Case

Patient D., 35-year-old man, consulted a gastroenterologist at the Internal Medicine Department № 1 of Bogomolets National Medical University. He had been complaining about attacks of burning pain in the epigastrium with spread to the right hypochondrium for 2 years. These complaints occurred periodically, without a clear pattern, not related with an eating. For the last 8 weeks, the frequency of pain has increased to almost daily that made him visited a gastroenterologist in private clinic:

- The results of complete blood count and biochemical test were within normal range;
- Upper GI endoscopy showed the signs of erythematous gastropathy;
- *Helicobacter pylori* infection test was negative;
- There was moderate stage of hepatic steatosis according to sonography.

The diagnosis of functional dyspepsia: Epigastric pain syndrome was established according to results of clinical findings with laboratory and instrumental methods. The treatment of this patients included pantoprazole 40 mg per day and mebicar 500 mg per day. After 3 weeks of unsuccessful treatment patient turned to the university clinic for an alternative consultation with a gastroenterologist. Due to detailing complaints and anamnestic data, it was found that pain occurs without obvious provoking and relieving factors, always at the time of waking up in the morning, the symptoms decrease in the evening, when drinking alcohol, but significantly intensifies for the next day after alcohol consumption. The patient has not bad habits, leads a healthy lifestyle and takes physical exercise weekly. In addition, the patient denies the presence of excessive emotional stress, as well as the connection of symptoms with them. As a result of the consultation, we made a preliminary diagnosis: dyspepsia, partial (focal) epilepsy, abdominal form? It is recommended to conduct electroencephalography and consult a neurologist based on its results. Conducting upper GI endoscopy, ultrasound and general clinical tests was irrelevant at that stage. Preliminary patient was recommended pregabalin 75 mg/day as a treatment until neurologist consultations, but it was recommended to consider the option: to refrain from taking the drug until consulting a neurologist.

EEG study: Low-amplitude polymorphic disorganized bioelectrical activity of the brain. There are signs of dysfunction of mesencephalic structures of non-paroxysmal nature with a predominance of desynchronizing effects, which have an adaptive-regulatory nature. Against the background of functional tests, focal changes were registered with accent in fronto-precentral areas, S=D, and areas of medial localization, accompanied by paroxysms of epileptiform nature without signs of involvement of mesencephalic structures and tendency to spread. Rhythmic photo stimulation showed increased photosensitivity and photoparoxysmal reaction.

ECG: Sinus rhythm, 70 per minute, with an adequate increase in heart rate on the background of functional tests with load.

Post treatment EEG dynamics: Photo paroxysmal response to rhythmic photo stimulation was registered in the lower lobes in the fronto-precentral areas, S=D, and in the areas of the middle localization in the form of complexes "sharp wave - slow wave", complexes "spike - slow wave" and "polyspike - slow wave" 3 - 6 Hz without propensity to propagate. In the interstimulation period, outbreaks of theta activity are registered in the precentral areas with lateralization on the right.

It should be further noted that during the photoparoxysmal reaction, the patient noted the appearance of symptoms that bothered him.

Other EEG data: Alpha rhythm is weakly irregular, disorganized, frequency is 10 - 11 Hz, amplitude is up to 20 μV, shape is irregular, the image is spindle-shaped, symmetrical. Beta-rhythm dominates, irregular, diffuse, frequency - 13 - 30 Hz, amplitude - up to 30 μV. Theta rhythm is available in the form of irregular waves, diffuse, frequency - 5 - 7 Hz, amplitude - up to 30 - 40 μV, short flashes of bilateral-
synchronous character of 5 - 6 Hz up to 30 - 40 μV are noted. Delta rhythm: diffuse unit waves, frequency - 0.1 - 2.8 Hz, amplitude - up to 15 μV. Adhesions, sharp waves: single, diffuse, without a stable accent. There is no paroxysmal activity.

The activation reaction is expressed in the form of depression and desynchronization lasting 1s (normal - 2 - 4s), single sharp waves.

**Clinical diagnosis:** Partial (focal) epilepsy, abdominal form. Together with a neurologist, we agreed on a change of treatment and prescribed carbamazepine 200 mg per day.

**Results**

Currently the patient is receiving the prescribed treatment and is under supervision for 8 months. During this time, no attacks of abdominal pain were observed, the tolerability of treatment was satisfactory (no side effects were observed).

**Discussion**

This clinical case, in our opinion, is glaring example of how thorough diagnostic assessment of the patient’s condition, his careful history, complaints, provoking and mitigating factors allowed gastroenterologist to build a correct diagnostic chain and prescribe EEG (as well as fundamentally correct empirical treatment to get results!) to this patient.

Today, the EEG remains a mandatory method of examination for epilepsy. After the first epileptic seizure, 39 - 50% of patients do not have epileptiform disorders on EEG and about 10% patients do not show any EEG disorders at all. To prove that the seizures are epileptic needs EEG, provocation test or EEG recording within 24 hours after seizure. It should be emphasized that patients with epilepsy are burdened with a large number of not only medical but also psychological, social, economic problems, the solution of which is often more important than the epileptic seizures themselves. Finding out the cause of the disease is the cornerstone of epileptology, because in 30-70% of patients the cause of the disease remains unknown, often throughout the patient’s life [8]. According to various authors, in adults with newly diagnosed epilepsy, the most common etiological factors are stroke, neurodegenerative diseases such as dementia or multiple sclerosis, primary or metastatic brain tumors and traumatic brain injury [9]. One of the main keys of success in the treatment of epilepsy is the professionalism of the physician [10]. According to J Szaflarski., et al. [11], patients who were observed in specialized epileptology centers recovered or had significantly fewer seizures than those who consulted ordinary neurologists, and this did not depend on which antiepileptic drugs were treated. In this context, the above clinical case shows that specialists in the field of gastroenterology need to have basic knowledge and at least some vigilance about the possible association of dyspeptic complaints with the abdominal form of partial epilepsy.

**Conclusions and Practical Recommendations**

- Partial (focal) epilepsy should be included in the list of diseases with which the differential diagnosis of dyspepsia.

- Physicians of therapeutic specialties should be acquainted with the clinical options and symptoms of partial epilepsy, as well as with the peculiarities of its medical treatment, which will contribute to the early detection and better results of treatment of patients with epilepsy.

- It is necessary to conduct a detailed survey of the patient with a careful collection of complaints and medical history.

- It is necessary to refer for consultation to neurologist if the patients have FD, in the anamnesis of which there are head injuries, martial arts, hand-to-hand sports, football, recently suffered severe infectious diseases with severe intoxication syndrome.
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- Early detection of “somatic masks” of partial (focal) epilepsy, which by their nature is actually an “aura” of a possible, unpredictable secondary generalized epileptic seizure, will allow timely treatment and prevent its development.

Competing Interests

None declared.

Bibliography


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