

Episodic Memory in Patient with A grand mal Seizure

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Abstract: This study examines the episodic memory in a grand mal seizure, the aim is to detect the impact of epilepsy by the duration of the injury and the type of seizure on memory in particular episodic memory, as well as how episodic memory disorder affects subjective states of consciousness. This is done through a case study approach using observation, clinical interview, case history, and testing the episodic memory. Both the work of Endel Tulving and Pascale Piolino are relied on to interpret the episodic memory. The results indicate that the recurrence of a grand mal seizure leads to a weak recovery of episodic memories in the infected young man, and that the weak recovery of episodic memories is accompanied by a disturbance at the level of consciousness.

Keywords: Memory; episodic memory; epilepsy; grand mal seizure; consciousness.

الملخص: ذاكرة الأحداث عند الشاب المصاب بالنوبة الصرعية الكبرى.

تناولت هذه الدراسة موضوع ذاكرة الأحداث عند الشاب المصاب بالنوبة الصرعية الكبرى، وذلك بهدف الكشف عن مدى تأثير مرض الصرع من حيث مدة الإصابة ونوع النوبة على الذاكرة، وخاصة منها ذاكرة الأحداث، وكذا كيفية تأثير اضطراب ذاكرة الأحداث على الحالات الذاتية للوعي. وذلك من خلال منهج دراسة الحالة باستخدام الملاحظة والمقابلة العيادية، وتاريخ الحالة، واختبار ذاكرة الأحداث. وقد تم الاعتماد على كل من أعمال Endel Tulving و Pascale Piolino في تفسير ذاكرة الأحداث، بحيث دلت النتائج على أن تكرار حدوث النوبة الصرعية الكبرى يؤدي إلى ضعف في استرجاع ذكريات الأحداث عند الشاب المصاب، وبأن ضعف عملية استرجاع ذكريات الأحداث يصاحبه اضطراب على مستوى الوعي.

الكلمات المفتاحية: الذاكرة، ذاكرة الأحداث، الصرع، النوبة الصرعية الكبرى، الوعي.

Introduction

The human needs all his mental and cognitive faculties to adapt and develop within his surroundings, through that, he can understand, learn, think, solve problems, and make decisions. These mental processes also work as an integrated

activity within the cognitive system and are multiplied according to the desired activity (A.Chalabi, 2001: 66).

According to Patrick Lemaire's 2002 study "Psychologie cognitive", Bruxelles, Boock university edition ,p95." , the memory is a cognitive process through which we learn and retrieve what we have learned, and we have gained from previous experiences, the first process is done by receiving information and processing it, and then storing it in long-term memory, the second process is retrieving and extracting information from the store in the long memory of short-term memory and using it (P, Lemaire, 2002: 95) therefore any defect or hit at the level of the brain, such as in epilepsy can affect memory, especially the episodic memory, and mainly in the process of recalling events.

Memory is one of the main topics of modern cognitive psychology; contains many theories and hypotheses about the nature of memory, its work and mechanisms, and one of the topics of memory that currently interest various researchers is to classify it into long-term memory and short-term memory, every detail. What interests us in this context is long-term memory, with Tulving distinguishing between two types of long-term memory: semantic memory and episodic memory, as well as memory disorders and the substances that can affect them, and changes occurring due to variables, including epilepsy, the heart of our study, where epilepsy is a chronic disease characterized by the recurrence of seizures, these seizures are changes that include severe clinical symptoms such as motor, sensory and psychological, which may be accompanied by loss of consciousness and mainly associated with the discharge of irregular and oversynchronized charges of a light or often

expanded group of neurons of the cerebral cortex. These attacks promote a significant increase in memory deficits, highlighting the extent of the great difficulty in recovering memories or their information, the appearance of a disturbance of consciousness and the loss of other mechanisms.

Rationale of the study

Memory is one of the most carefully considered cognitive processes of many studies in a long time and this attention is due to its extreme importance as the mainstay of other processes in the structure of the mind, the stronger is the memory, the more capable the mind think and solve problems, so the memory has an active role in adapting the human being and solving his problems and is the cornerstone of psychological growth. (Foukiah Ahmed, 2003:120).

The episodic memory occupies an important place in human's life, being the vessel that stores and maintains temporary facts and events, and the relationships between these events, which are historical and personal. We remember what happened to us and in what order, that is the chronology of events, when they happened, where and so on. They are also subject to change and loss, but it is considered as an important memory for identifying events, and may be an episodic memory that is short-term or long-term (Abdellah Mohammed, 2003 :64).

Tulving is the first to define it as a memory that must work under the consciousness of the individual, consisting of the life experiences of the individual, specialized in personal matters, extending its background to the past in the form of memories, and the prospects of the future in the form of planning and preparation for the success of the individual. (Baddeley, A , 2001 :25)

Neurological disorders are one of the most serious problems affecting humans; this is due to the significant difficulties and

cognitive disorders they cause. Epilepsy may be one of them, and the clinical schedules of an epileptic seizure are determined by the location of the active fireplace that emits turbulent electrical waves, as well as by the severity of these waves and the extent of their spread, so what happens during an epileptic seizure varies fundamentally by type. (Sami, 1993:60).

Epilepsy has many different types of symptoms and pathological types, every human being is exposed to organic injuries of varying degrees and multiple causes, epilepsy is a word that has a special undesirable effect in many people as a result of its effects.

From what we have mentioned previously, the problem of the study can be identified in answering the following questions:

How does a **grand mal** seizure affect the episodic memory of an ill young man?

What are the most important implications of this impact process?

Study hypotheses:

In the light of these questions, we have raised the following hypotheses:

A **grand mal** seizure leads to a poor recollection of episodic memories in an ill young man.

A weakness in the recollection of episodic memories is accompanied by a disturbance at the level of consciousness, especially autonomic

The importance of the study lies in its essence, so that research in the field of pathological psychology of epilepsy is generally few, especially if it is involved with the cognitive processes represented by memory, where we tried to collect the data that was available in our hands, to highlight the extent of the significant negative impact of epilepsy in the

dedication and deepening of the episodic memory, which allows for the establishment of temporal and causal links between events. An epileptic seizure, however its origin, affects the processes of the identifier, especially the episodic memory.

Purpose of the study :

- Trying to detect the extent to which a grand mal seizure affects the episodic memory of the ill young man.
- Detect the nature of disorders associated with episodic memory impairment in an ill young person, such as how the memory of episodic disorder affects the subjective state of consciousness.

Study Design:

1. Theoretical background of the study This study deals with two parts within the theoretical framework: the episodic memory and its various characteristics and elements and some explanations about epilepsy and various types of seizures.

1.1 Episodic Memory

The concept of episodic memory, a relatively recent concept in the fields of cognitive psychology, was introduced about 30 years ago, where it was referred to at the time as a set of commands and tasks, and who was reviewed more broadly, it was previously pointed out that Tulving was the first to touch in detail the episodic memory in 1983, if the episodic memory is what we remember and contains information organized by specific context.

(Baddeley, 2001:26) also defined it as a mental system, a brain distinct from the rest of the memory systems, so that the man can remember past events and experiences.

In 2002, Tulving described it as a basic ability characterized by the combination of three concepts: self, mental and self-awareness and time, and therefore a special

memory pattern in which we preserve what is happening in our lives from the specific events of time and space, which is the neurocognitive pattern that enables us to consciously remember events as in the individual's experience. (Tulving, 2002 :182)

In 2008, Szakacs & Blanke stated that this self-conscious knowledge of time is due to our unique human abilities to remember the past and imagine the future, which enables us to recreate our own past experiences by putting ourselves in the time and place of previous experience, and by imagining a past experience that has occurred in the past, or by putting itself in the future during imaginary events that have not yet occurred. (Abdelhamid Sania, 2009:35)

The most important characteristics of the episodic memory:

- The episodic memory depends on the awareness of one person himself and the surrounding world, without awareness, the episodic memory cannot be formed and events cannot be retrieved.
- The process of remembering using the episodic memory takes a metaphorical form of time travel, where the person returns his memory to the past to remember some events, and is often retrieved in the form of visual images.
- It is remembered in the chrono real order of its occurrence.

Epilepsy

Epilepsy is a chronic disease of the brain, characterized by the occurrence of frequent seizures as a result of the flow of multiple charges or electrical impulses from the brain cells, and the symptoms take the form of a disturbance of consciousness, motor disorders, digestive and physical (Abdul Guafoor, 2009 :12) by studying brain waves, seizures were found to be a lack of compatibility between different brain centers.

Each seizure, whether general or partial, is controlled through its own axon, the latter has a limited number of corticosteroid and subcortical systems, the hyperactivity of these axes leads to a seizure. (Abdul Rahman Al-Issawi, 1974:100).

Epilepsy is classified in terms of cause to three types:

1. **Idiopathic epilepsy:** affects the child and adult, and includes all types of genetic epilepsy.
2. **Symptomatic epilepsy:** called secondary, affects all types of acquired epilepsy.
3. **Cryptogenic epilepsy:** for an unknown reason, it contains all types, so that the condition does not suffer from specific neurological damage and at the same time the genetic nature of epilepsy is uncertain.

Seizures can also be divided into partial seizures, including minor and complex, general seizures and unclassified seizures.

Partial epileptic seizures is developed in a part of the brain and then affect the whole hemisphere or a part of one of its lobes. The symptoms vary depending on where epilepsy occurs: Simple ones may be affected by a small portion of the lobes but the person remains conscious. When this is the case, it is called a simple partial seizure.

Complexity affects a larger part of the hemisphere compared to a minor partial seizure, and a person may lose consciousness.

The grand mal seizure, which is the subject of our research, whose symptoms can be monitored below: all the brain is immersed, the patient loses consciousness and falls on the ground, and all his muscles are firm and becomes stiff (that is in a state of stiffness) and the contraction of the muscles of his chest resists the exit of air from his lungs and may cause a terrifying cry, and the bladder is grasping and often wets itself, and it is not common to contaminate himself and at first he is pale and quick to blue because he does not breathe . If you notice the state of stiffness (case of sclerosis) you feel that it is over, then the muscles relax and contract again violently and relax in succession and tension results in seizure or convulsion movements that last for several minutes, and this condition is called (spastic or vibratory condition) and in each contraction is necrosised and embedded in the mouth and in the form of air bubbles through saliva and these are blood-trace, gradually, the convulsions and movements are less violent and the periods of relaxation are longer, and when all these things stop together, breathing returns to normal, and in any case the brain is stressed and the patient remains unconscious and within minutes the feeling returns to him, and because of being stressed, it takes in deep sleep and therefore the patient in an unconscious state throughout the seizure does not fully realize and does not remember what is happening. (Abbas mahmoud, 1999 :142)

Study Approach

In our study, we followed this clinical approach, which is based on the case study, and on the clinical

interview, the history of the case, clinical observation and psychological tests.

The study was conducted on two cases selected according to the basic variables of the study.

Study tools:

In order to achieve the objectives of the study, the following tools were used:

Clinical interview: The interview is a listening method that allows us to collect the most personal, familial and social information, as well as a basic rule in clinical psychology.

It is considered one of the best ways to test and evaluate personal qualities, as it has a great benefit in identifying the problem closely, and there are many uses of the interview in the domain of psychology in all its fields, depending on the variety of its forms and types, either individual, restricted or free according to the intended objective.

In our study, we relied on the interview and half of the course to give a kind of freedom of expression to the two studies.

Clinical observation: According to Norbert Selami, it is known as a method followed by the researcher in observing the behavior and expressions of the individual,

And his gestures, the way he talks, his accompanying commitments and his responses due to the interview questions (Mourad salleh, 2002 :300).

Psychological tests:

Pascale Prolino was used to test the episodic memory and it is a test that covers four ages.

The tester is required to retrieve events during these age stages, so there are instructions to be read to the patient. Before the test is applied, each age phase contains three questions and each question contains an indicator.

Therefore, these questions are frequent at all age levels. This test explores an individual's ability to recall personal and detailed events of four stages of life, and detailed events within a specific temporal and spatial framework that we can consider to be private events only.

Each retriever event is dotted with 4 points in case:

- Respect the event property (single or duplicate event).
- Put it in time and place (we mean time today and hour).
- The level of detail in the event.
- In the case of a special event, a single source, located in time and place, is well detailed and offers 4 points.
- In the case of a special event, a single source, present in time and place, but the least detailed, offers 3 points.
- In the event of a general or recurring event, or an unknown source, located in time and space, he is given 2 points.
- In the case of a transient event, a recurring source, not present in time and space or an impression of a person, offers 1 point.
- In the absence of a response, or general knowledge, it is estimated at 0.

So, all four stages are dotted at 12 degrees, that is, each question drops at 4 points as maximum and since each stage contains three questions, the drip is as follows: x34

R/K self-assessment of Gardiner's self-conscious state of consciousness:

Definition: This procedure introduced by the scientist Tulving and developed by Gardiner allows the evaluation of the subjective states of consciousness and is called a procedure I remember /know so that the examiner is asked to provide how his or her self-state of consciousness while retrieving information, and he must mention the objective

content **le quoi** and then the spatial content **le ou**, then the temporal content **le quand**.

There are three types of supposed answers:

- Answers of the kind ***I remember (je me rappelle)***.
- Answers of the kind ***I know (je sais)***.
- Answers of the kind ***I suppose (je suppose)***.

If the answers are of the first type, this means that the individual has identified the items that mean the conscious remembrance, that is he recalls all the conditions of learning, and here he is accompanied by the identification of a special event resulting from his or her thinking and learning.

If the answers are of the second type, this means that the identification process is associated with sense of familiarity, he cannot relive the event mentally by learning it. If the answers are type III, this indicates that the individual is unsure of his answer.

1- Results of the study:

1-1- Presenting the two cases:

Case 1:

Farida belongs to a well-off family, her father is a doctor and her mother is a teacher, she is the second among her brothers, eldest son is 20 years old and he studies at university, she has been with epilepsy for about 8 years, the condition has suffered a febrile seizure at the age of 18 months and after being treated with antibiotics improved her condition, and she has not suffered any seizure until she entered school at the age of 9 years where she was studying in the fourth year of primary school. She suffered from her first seizure at the school where she fell to the ground and passed out with some movements at the level of hands and legs, which necessitated taking her to the hospital and undergoing examination, it was not clear then that anything, but after several tests was

diagnosed with idiopathic epilepsy by a neurologist accompanied by general seizures.

Interview summary: First case:

After several interviews with the case, it was assumed that her answers were superficial and brief, with no details about her illness, and the absence of temporal content.

The situation has limited her friendships, she always tries to avoid relationships only because her illness hinders her social communication. The condition has shown great psychological suffering due to her illness; she is so busy with her illness that she is waiting for a seizure and preparing the days for it to happen. She suffers from a defect in the level of recollection, especially childhood, she did not talk about much.

The first stage:

- The first question: a personal impression, a single source, the absence of a temporal and spatial framework.
- The second question: a special event, a total absence of details, the absence of time and the existence of place.
- The third question: personal impression, total absence of details, absence of time and place.

The second stage:

- The first question: a personal impression that is not available in time and place.
- The second question: a personal impression, a frequent source, the presence of the spatial frame and the absence of time.
- The third question: a fleeting event, a frequent source, the absence of details.

The third level:

- The first question: a special event, a single source, the existence of space and the absence of time

- The second question: a transient event, a frequent source, the existence of place and the absence of time.
- The third question: a special event, the absence of details, the total absence of time and place.

Final stage:

- The first question: a personal impression, a single source, the absence of time and place.
- The second question: the absence of response.
- The third question: lack of response

In the light of these findings, we find that the situation suffers from a lack the episodic memory at the level of all age groups. The R/K procedure reveals that the case provided answers of a type that I know more than one of the kind I remember, indicating that the situation cannot evoke or live the event mentally, with the absence of a conscious recall process.

Case 2:

Muhammed is 19 years old; he is the second among his three brothers, he is in the ninth grade, he lives with his father and stepmother in poor economic and social conditions, his father is a daily worker, there is no income for the family, which led the son to stop studying and going out to earn a living for his family. Muhammad had several other seizures that required anti-epileptic treatment for 500g Dépakine.

Interview summary: Case 2:

It turns out that the condition is fully aware of his state of health by submitting his illness and various symptoms from time to time, although his illness is a hindrance and causes him to be annoyed and worried all this because of the pain that accompanies each seizure.

The situation shows negative responses to all the situations to which he is exposed because, in his opinion, it is all due to his illness.

For the third question: general knowledge, the existence of the spatial framework and the absence of time.

Test results:

The first stage:

- The first question: a transient event, a recurring source, the existence of a spatial frame and the absence of time.
- The second question: a personal impression, a frequent source, the absence of time and place.
- The third question: personal impression, absence of time and place, lack of details

The second phase:

- The first question: a personal impression, a frequent source, a total absence of a temporal and spatial framework
- The second question: a transient event, a recurring source, the existence of a spatial frame, with the absence of time
- The third question: a transient event, a frequent source, the absence of a spatial framework, with the absence of details

Third level:

- The first question: a transient event, a total absence of a spatial framework.
- The second question: a transient event, the existence of a temporal and spatial framework.
- ✎ • The third question: a personal impression, a frequent source, the absence of a temporal and spatial framework

Final stage:

- The first question: a person's impression, a single source, the absence of a time frame, a total absence.

- The second question: a transient event, the absence of a time frame and the existence of space.
- The third question: general knowledge, the existence of the spatial frame and the absence of time.

In the light of these results, the situation suffers from a lack of the episodic memory at all age levels, from childhood to adolescence, adulthood and recent years.

The case provided answers of a kind that I know more than one of the kind I remember, which proves that the situation, despite its recollection of the event, cannot be re-examined mentally in the absence of a conscious recall process.

3- Discussion of the results:

3-1- The first hypothesis:

The study's hypothesis stated that a grand mal seizure leads to poor recollection of the episodic memories of an ill young man. It can be said that the hypothesis has been achieved in both cases.

The first case showed a disability and a breakdown in the retrieval of memories, which was manifested in the lack of a list of the events of her seizures as well as when asking some questions about her personal life, and this was confirmed by the results of the test through her inability to list events in all age stages, especially childhood.

As for the second case, he was presented with this deficiency by not being able to recount events, sequence them and arrange them according to their retrieval, and failing to provide details with regard to educational information and educational attainment, as well as living with his illness.

This weakness in recollection of episodic memories is due to epilepsy, especially when a person has a major epileptic seizure, as confirmed by the results of the Genevieve Rayner M. Det Sarah study, J. Wilson argues that the decrease in

episodic memory is associated with the early age of epilepsy as in both cases and the frequency of seizures means the number of recurrent seizures per week.

The results of the study are also consistent with the findings of a study (Ahmed Okasha, 2005) that there is memory loss after a concussion, electrical sessions and big seizures.

The results also, coincide indirectly with those of his study (Viscontas, 2000) on episodic memory deficits in patients with temporal lobe epilepsy, which showed that these patients suffered from impaired memory of episodic while the semantic memory remained intact.

These results can be explained in the light of the study, as both cases showed deficiencies in the level of total memories, and at different age stages, as well as in terms of disability and poverty in terms of content and detail, and therefore it can be said that the two cases produce few special memories, which was demonstrated by the evaluation results of Pascale Piolino's memory test, in other words, the results revealed several imbalances in the episodic memory.

3-2- The second hypothesis:

A weakness in the recollection of episodic memories is accompanied by a disturbance in the level of consciousness or the conscious recollection process.

Based on the results obtained through the clinical interview, observation, and Pascale Piolino test, showed that both cases provided answers of a type I know more than the answers of the kind I remember, which means that both cases had the ability to feel familiar with a special event or anniversary while being able to experience the special aspects of episodic memories mentally such as perceptions, thoughts, feelings or feelings present during the living experience were very weak, this also means that the findings confirm a disturbance at the level of consciousness or the conscious recollection process,

while the sense of familiarity remained preserved in both cases, which corresponds to what was revealed through gardener's R/K test.

The disorder of the conscious recollection process is a reflection of the presence of a disturbance at the level of the episodic memory, and may be caused by a disturbance in the encoding or during recovery, and the difficulty in retrieving information may be a major cause of observation altogether. So, all these disturbances are in fact the product of all the difficulties recorded at the level of the process of retrieving private information.

The large section of memories shares with the conscious process of recollection, as is known in the psychological heritage, this kind of memory is linked between our past and present goals, but also with our motives and desires, all of which are the mainstay of the character.

Conclusion

In the context of our episodic memory in a person with a grand mal seizure study, and through the results, we conclude that the person with a grand mal seizure has less production of episodic memory, which leads us to say certainly that epilepsy has effects that do not stop at the limits of the seizure or the age of the onset of the disease, but goes beyond that by the emergence of several cognitive and behavioral disorders in the young man, which is prominently reflected at the level of episodic memory, as pointed out (Sazex and Planck, 2008) The past is special, by putting oneself in the time and place of previous experience, imagining past experience that has occurred in the past, or by putting oneself in the future during conceptual events that have not yet happened.

Bibliography

1. Abbas Mahmoud Awad, (1999): "Physiological Psychology", University Knowledge House, p142
2. Abdel Hamid Sania, (2009): "Past and Future Personal Events on the Cheek of Life," Egyptian Journal of Psychological Studies, Issue 68, 2010, p. 35-52
3. Abdul Rahman Al-Issawi, (1974): "Physiological, Psychology" Arab Renaissance House, Beirut1, p. 100
4. Abdullah Mohammed, (2003): "Memory Psychology, Modern Issues and Trends," Cairo, Series, World of Knowledge, p64
5. Abdul Ghafoor Turkistani, (2009): "Epilepsy, Diagnosis and Treatment", p12
6. Ahmed Chalabi, 2001: "Introduction to Cognitive Psychology", Jordan, House of Thought, p66
7. Ahmed Okasha, (2005) "Physiological Psychology", Anglo-Egyptian Publishing Library, I10, Egypt, p120
8. Baddeley, A. (2001): "The concept of episodic memory", New York: British Library Cataloging in Publication, ,p25
9. Foukiah Ahmed Sayed, 2003, p120
10. P.Lemaire, (2002), " Psychologie cognitive ", Bruxelles, Boock university edition ,p95.
11. Murad Saleh and, 2002.
12. Sami Abdul Quwa, (1993) p60,
13. Tulving, E, (2002) "Episodic Memory": From Mind To Brain. Rotman, Research Institute if Baycrest. Toronto. Canada, p182.
14. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC508507/>.
15. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC508507/>.