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MOLECULAR-PHYSIOLOGICAL MECHANISMS OF THE MAIN FACTORS AND CONDITIONS OF MEMORY DEVELOPMENT, THE IMPORTANCE OF ENVIRONMENTAL FACTORS IN THE FORMATION OF MEMORY

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Abstract

The purpose of the study: by studying the molecular-physiological mechanisms of memory formation, we can find out the capabilities of the human brain. The main thing is that by fully studying the formation of memory, we will know the material foundations of the development of memory, and to consider the importance of memory in the formation of the background, we will consider the role of upbringing and labor to become the owner of a strong memory.

Keywords: afferent nerve fiber, Axon, AXO-somatic Synapse, glutamate mediator, AMPA(alpha-amino-3-hydroxy-5-methyl-4-isoxazolpropionic acid) ionotropic receptor, NMDA (N-methyl aspartatic acid) ionotropic receptor, calmodulin protein, CaM-(calmodulin) kinase, phosphorylation, adenylate-cyclase, s-AMF(cyclic-adenosine-mono-phosphate acid), map(mitogen-activated protein) -kinase, glial neuron, myelin, “memory cells”

Relevance of the topic:

It is known that the virus, which received the name of the RNA-preserving Covid 19, which began to spread in 2019, caused a pandemic. The covid virus strain differs from others in that it causes pathologies in all members. Including, the Covid 19 virus has also been found to proliferate in cranial neurons and glial cells. It can be seen from this that in people infected with the Covid 19 virus, various pathological conditions can occur in the head brain. We want to find a response by studying how much Covid 19 has affected human memory (memory formation), the molecular mechanisms of memory formation.

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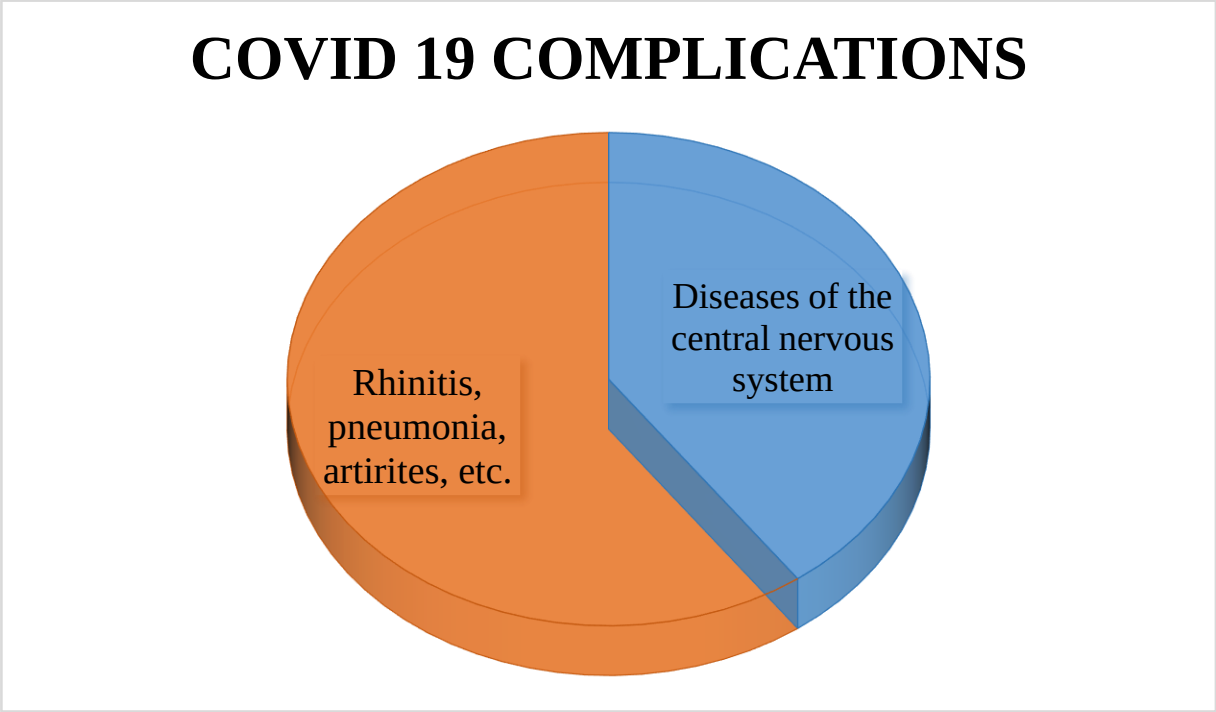

Methods

We used the observation method in the process of writing the article. The reason why I came to these conclusions is that as a result of observing and talking to my fellow students and people around me, I studied their complaints about memory. Almost all of the monitored persons are those who follow a healthy lifestyle, therefore, we paid the main attention to how much they work, without paying attention to their diet. When we took a closer look at the persons with memory problems among the studied persons (14 persons in total), it became clear that they received less information, that is, they read less books. It is known that people who do not have problems with their memory read a lot of books.

Memorizing ten words (Ebbinghaus method)

Purpose: To check the level of recall. This method is designed to test short-term memory.

Necessary materials: For this, you need a table with 10 words that are not close to each other in meaning. For example, house, apple, pencil, sky, iron, horse, flower, paper, river, room. Explains the purpose and rules of the inspection.

Instruction: "Now I will read 10 words. You listen to me carefully and you have to remember those words. When you finish reading, you can say them in any order you want." Of course, it is difficult to remember all 10 words on the first try.

Therefore, the following instruction is given to the patient: "Now I will read those 10 words again. You have to remember all of them and tell me again. You don't have to repeat them. "Repeat 10 words until the patient can say all the words correctly will read.

Display the results: The result of each attempt is in the test form is reflected. A "+" sign is placed under the word that the patient said. For example, in the 1st attempt, he memorized 5 words, In the 2nd attempt, he memorized 7 words and so on. If the patient says another word if he says it, this word will

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be written on the margin. 30 minutes later,recall those 10 memorized words without warning the patient you will be asked to download and tell.

Test form

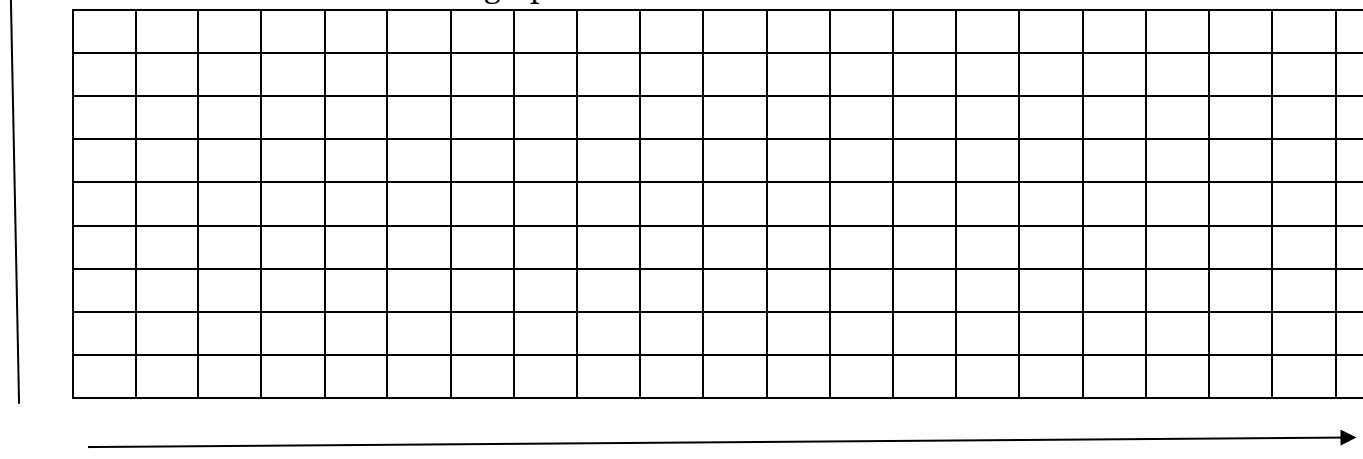
Name _____ age _____date_____

№	1	2	3	4	5	6	7	8	9	10	an overused word
	house	apple	pencil	sky	iron	horse	flower	paper	River	room	
1											
2											
3											
4											
5											
6											
7											
After 30 minutes											

Levels of recall, points:

1. Very high recall - 4 points (10 words after 2-3 attempts
he repeated with full memory);
2. It is good to remember - 3 points (after 5-6 attempts, he repeated 10 words with full memory);
3. Slow recall - 2 points (complete 10 words after 7-8 attempts
remembered and repeated);
4. Very slow recall - 1 point (remember even after 9-10 attempts
can't get it, it's stuck in one place).

The results are shown in this graph:



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Graph to determine recall. On the abscissa axis – recall omitted words; On the ordinate axis - the number of attempts presented to the patient sequence number.

Based on the obtained results, a graph is made and in it information is displayed. A healthy person should say 10 words every time he memorizes as many words as he goes, and a person with a poor memory unable to retell the words, forgets them. Some repeat only 5-6 words after 4-5 attempts and stop. Such

the condition indicates fatigue of attention and slowness of memory. Saying too many words, forgetting what you said before not only distraction and memory loss, but also emotional stagnation and is also a sign of numbness of thoughts. 30 or 60 memorized words after a minute, the patient may be asked to repeat. If all the previously memorized words are remembered again, then it is long term memory is also good. However, since there are many types of memory, a conclusion about the strength or weakness of a person's memory based on one examination cannot be issued.

№	1	2	3	4	5	6	7	8	9	10	an overuse word
	house	apple	pencil	sky	iron	horse	flower	paper	River	room	
1		+	+		+	+		+	+	+	
2	+	+	+	+	+	+	+			+	car
3	+	+	+	+	+	+	+	+	+	+	
4											
5											
6											
7											
After 30 minutes	+		+	+	+		+		+	+	bag

Levels of recall, points:

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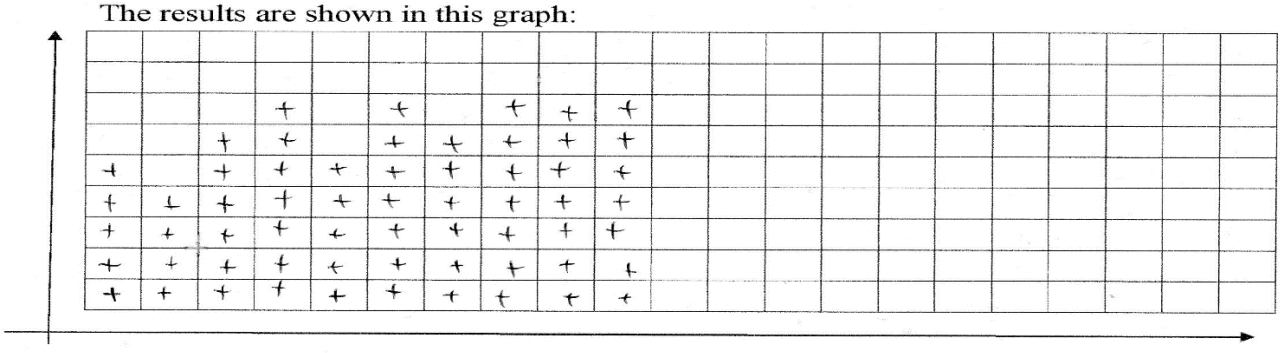

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The above graph shows the result of the experiment conducted on the person named M.S.Q. It can be seen from the graph that this person has a good memory. I conducted this experiment with 14 (5 boys and 9 girls) classmates. The results are as follows: the recall of 6 people is very high (4 girls and 2 girls), the recall of 7 people is good (3 boys and 4 girls), the recall of 1 person is weak (girl). But after 30 minutes, when the words recalled were checked, the boys scored better (8 words for boys, 6 words for girls). It can be seen that girls' short-term memory and boys' long-term memory are well developed . (the experiment was conducted on March 10 among students of Tashkent Medical Academy, Faculty of Medicine, group 204-B).

Mental processes such as remembering, recalling and forgetting things and events perceived in the past are called memory. Any experience, any impact, a person remembers for a short or long time, in the form of a "trace" of these events. We remember words and phrases, as well as images that can be restored in the form of imagination, and three main functions of memory are distinguished: remembering (remembering), remembering and recalling. Also, forgetting is one of the memory processes. Temporal connections between traces are important in memorization. These temporary connections or associations are a type of conditioned reflex. For example, if a child is shown something unfamiliar to him, say, glasses, for the first time, he will not be able to name it. But if he has heard about the structure of the glasses before, this information is stored in the brain as memory traces and he can tell the name of the glasses shown to him. Because between the traces in the brain formed from the image of vision and the word "glasses", conditional reflex links, that is, associations, appear, and as a result, the name of the object is restored in memory. So associations are very important in the process of memory. The word "association" in Latin means "association". Any information is initially stored as short-term memory. If the brain structures make a "decision" about the need for information, it becomes long-term memory. Otherwise, it remains as short-term memory, that is, the information is deleted from the brain.

E. Hebb (1949) divided memory into short-term and long-term memory. Short-term memory impairment is associated with a strong impact on the brain after an event. In animal experiments, it was found that when the brain is strongly affected after training an animal for something, what was studied disappears, while the qualifications it had previously received are preserved. The brain is strongly influenced by pharmacological drugs, extreme cooling, impaired oxygen supply.

In the experiment, mice withdraw themselves from climbing onto the field after electrocuting it. Initial, 30-second-long behavior of electrically affected mice was observed in the mine. If the mouse is hit by a vine and is hit by Ether narcosis within 10 minutes, the conditioned reflex that escapes from the field disappears, and the mouse continues to take the field again. Ether narcosis partially impaired the conditioned reflex if missed 16-20 minutes. Narcosis given to mice 24 minutes after the stroke of the vine absolutely does not affect the formed conditioned reflex.

This can be explained as molecular-physiologically as well: in the area of synaptic (AXO-somatic) Binding of Afferent nerve fibers formed by End-order neurons in the cranial cortex, as a result of depolarization of the nerve fiber (afferent neuron), the glutamate mediator exits into the synapse cavity and excites the neuron (end-order) receptor on the Soma. The result is the entry of Na^+ ions across the

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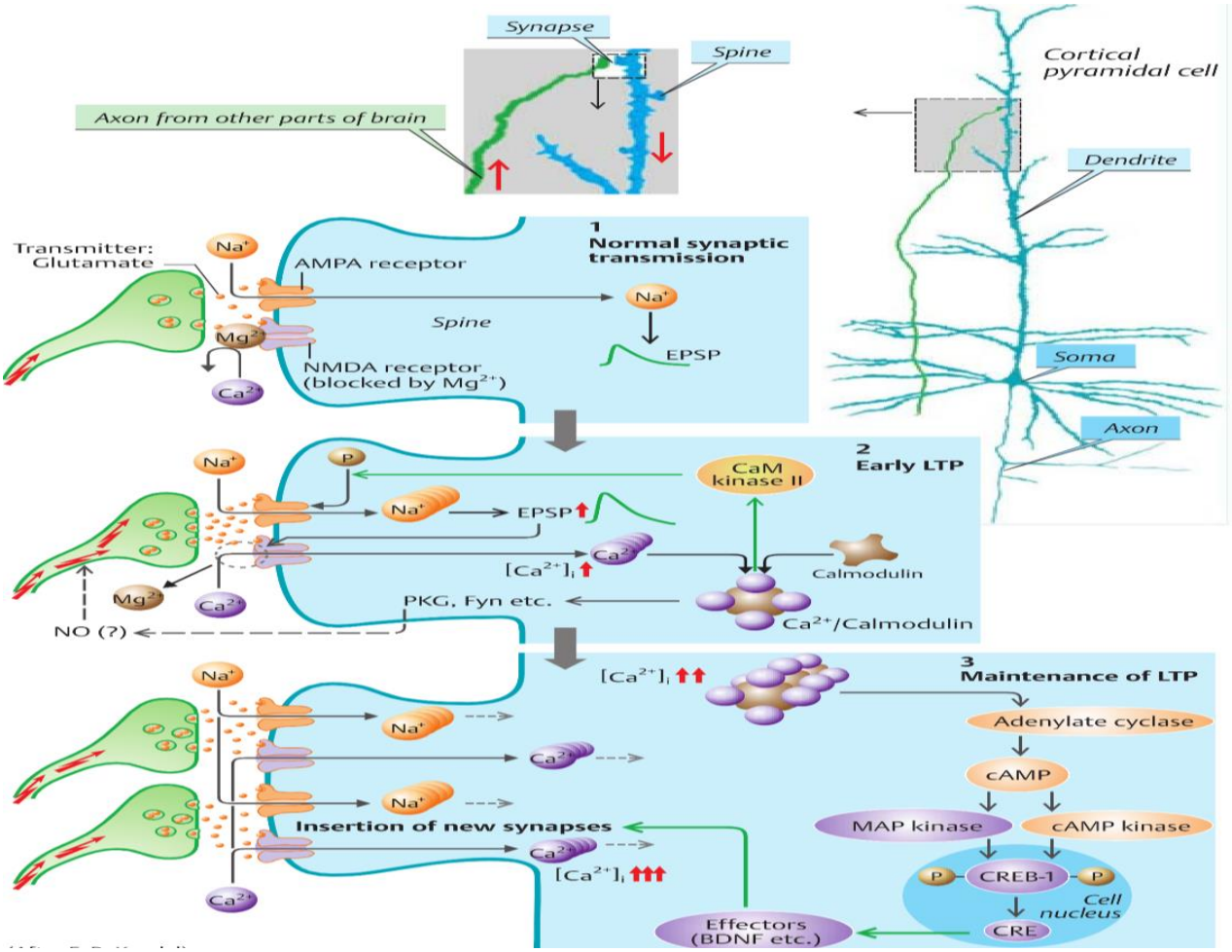
membrane (via AMPA ionotropic receptor channels) in the final order neuron. Na^+ membrane entry ensures that Ca^{2+} ions enter the cell (in which the glutamate mediator is bound to the NMDA ionotropic receptor-Na^+ ions entering the cell in large quantities ensures that Mg^{2+} ions leave the NMDA receptors that are blocking the Mg^{2+} ions and opens the way for Ca^{2+} ions to enter) (short-term memory). The fact that Ca^{2+} ions form many complexes with the Calmodulin protein activates the enzyme CaM-kinase, which is an AMPA ionotropic receptor. An increase in the Ca^{2+}-calmodulin complex activates the enzyme adenylate-cyclase which activates cyclic-AMF. Cyclic-AMF activates MAP-kinase and cyclic-AMF-kinase. These enzymes phosphorylate transcription factors in the neural nucleus and activate protomoter (CRE)and new synapses are formed (long-term memory) . Glial cells enable the growth of afferent neural axons in the formation of new synapses and The Binding of the membrane to the depolarized end-order neuron. If the impulse arrival through this new synapse is constant (i.e. the memorized poem is continuously repeated) this Axon is Myelinated and the rate of information transfer is further increased. If the opposite impulse fails to arrive (i.e. the memorized poem is not continuously repeated) after a certain period this Synapse may disappear and only a trace remains.



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Complementary thought: As we all know, one of the important properties of our nerve cells is neuroplasticity. If I consider this feature, a certain group of neurons of the last order of analyzers creates a temporary memory, and the axons of certain groups are usually free [that is, neurons of the last order of the analyzer, which have not formed synaptic connections]. After temporary memory neurons form a memory (i.e. long-term synaptic connection), another free neuron (a neuron in the cerebral cortex, in which certain analyzer neurons are connected with neurons with their centers) can form a synapse) forms a synapse with Under the influence of new event impulses, permanent memory is formed again, and temporary memory neurons form synapses with other free neurons. can be explained by remaining. For example, a memorized poem will disappear from a person's memory if it is not read back. The physiological mechanism of this situation is as follows: as it is known, in order to create a permanent memory, the last order must grow the axon of the neuron and form a synaptic connection, and for this there must be a source of energy. If, after the synaptic connection is formed, the impulses to it stop (that is, the poem is not reversed), the maintenance of the synapse loses its importance, and the glial cells do not feed this synapse. I do not need to conduct any acute experiments to prove these points. This can be proven simply by the fact that a person who has read a lot of books has a strong memory.

In Conclusion, we studied the material foundations of the formation of memory above. This means that certain substances must also be sufficient in the body for memory to form. Considering that the Covid 19 virus causes various changes in cranial neurons and glial cells, memory formation is a cause of disruption but it should not be assumed that even if the neurons infected with Covid 19 (if they are not primary nerve conduction neurons) do not perform due to the high number of new cells in a person of my memory has decreased due to. This is because well: taking strong memory as a personal-individual trait, it is possible to explain them by the fact that in individuals with such abilities, the metabolism of substances in the memory-forming cells that I mentioned above is high. One thing in this place should also be remembered that when we take a closer look at the lifestyle of people who have a strong memory, we will find that they read a lot of books. We have no choice but to believe that strong memory can be achieved by working hard(reading). We have listed the material foundations of memory above and explained the mechanisms. Considering that the brain is supplied with the necessary substances in the body first, a deficiency in the metabolism that occurs in the body (if there is no cause for any disease) cannot have a strong effect on memory formation. This suggests that the role of upbringing in the strength of memory is much greater. Just as the muscles of a person who is not engaged in physical education (even if he eats enough nutrients) do not become strong on their own, the memory of a person who has not read a book will not be strong. So, in order for us to develop society (to improve the memory of people), we need to develop ways to encourage people to learn more.

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