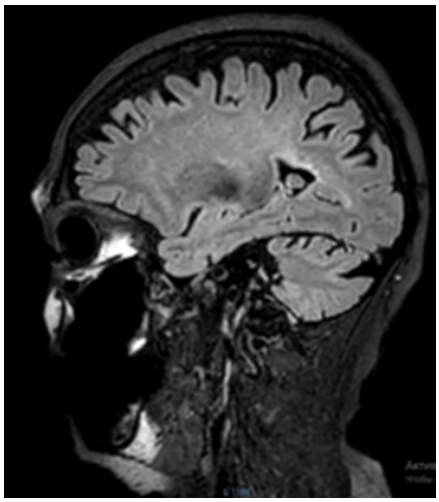

Figure 1 – MRI scanning of the sagittal axes of the head

Conclusions

This review emphasizes the critical role of cerebellar degeneration in neurodegenerative diseases and its impact on neurological function. Gaps persist in understanding its mechanisms, necessitating improved research methodologies and longitudinal studies. The patient with spinocerebellar degeneration exhibits intact cognitive functions but significant dysarthria and ataxia, alongside urinary incontinence, suggesting autonomic involvement. MRI scans are vital for confirming the diagnosis and ruling out other conditions. Neurological examination shows preserved muscle strength but decreased tone and severe coordination deficits. A multidisciplinary approach is essential for managing both neurological and pelvic dysfunctions, with further research needed to explore the link between spinocerebellar degeneration and autonomic dysfunction.

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V. M. Matam, A. K. Ballari

Scientific Supervisor: Ph.D., associate professor N. N. Usova

Educational Establishment
«Gomel State Medical University»
Gomel, Republic of Belarus

IMPACT OF STRESS ON COGNITIVE FUNCTION AND BRAIN STRUCTURE

Introduction

Stress, particularly chronic or prolonged stress, has profound effects on cognitive function and brain structure. Exposure to chronic stress leads to development of cognitive impairments in psychiatric disorders such as depression, anxiety disorder, obsessive compulsion disorders, post-traumatic stress disorder [1]. While acute stress can be adaptive and enhance certain

cognitive functions such as alertness and memory in the short term, chronic stress can impair brain health, leading to significant alterations in cognitive performance and brain structure [2]. The relationship between stress and the brain is complex, involving a variety of biological and psychological mechanisms [3]. This abstract explores the impact of stress on cognitive function, including memory, attention, and decision-making, as well as its effects on brain structure, focusing on areas such as the hippocampus, prefrontal cortex, and amygdala.

Goal

The primary objective of this study is to explore the relationship between stress and its effect on cognitive functions such as memory, attention and decision making as well as structural changes in brain associated with prolonged stress exposure.

Material and methods of research

This study employs a literature review of existing research articles published in PUBMED, SCIENCE DIRECT and GOOGLE SCHOLAR peer reviewed journals. Data were collected from studies utilizing neuroimaging and cognitive assessments to evaluate the effects of stress on brain structure and function.

The results of the research and their discussion

Stress activates the body hypothalamic pituitary adrenal axis [HPA], which leads to release of stress hormones which are cortisol and adrenaline. These hormones prepare body for "flight or flight" response. Prolonged activation of stress response due to chronic stress leads to negative affects on brain elevated cortisol levels can have neurotoxic effect on brain regions that are particularly involved in memory, emotional regulation and executive function. [4] Impact of stress in cognitive functions:

*Memor*y: Prolonged exposure to high cortisol levels can harm both short-term and long-term memory. The hippocampus, crucial for forming and retrieving memories, is especially affected, which can lead to memory issues and increase the risk of depression and anxiety [5].

Attention and Focus: Stress makes it harder to concentrate. It disrupts neurotransmitter systems, like dopamine, making it difficult to filter out distractions and maintain focus, resulting in decreased cognitive performance and increased mental fatigue.

Decision-Making and Executive Function: The prefrontal cortex (PFC), which governs decision-making, planning, and problem-solving, is also impacted by stress. Chronic stress can impair the PFC's ability to manage emotions and make rational choices, leading to impulsive behaviour and poor judgment [4].

Impact on Brain Structure

Chronic stress not only affects cognitive functions but also causes structural changes in the brain:

Hippocampus: This area is highly sensitive to stress and cortisol. Prolonged stress can lead to shrinkage of the hippocampus, which is linked to memory problems and a higher risk of neurodegenerative diseases. This atrophy can impair the brain's ability to form new memories and manage emotions [5].

Prefrontal Cortex (PFC): Chronic stress is associated with reduced gray matter in the PFC, which is crucial for cognitive control, emotional regulation, and decision-making. Changes in this area can lead to difficulties in planning, making decisions, and maintaining focus.

Amygdala: The amygdala, responsible for emotional processing and threat detection, often becomes overactive with chronic stress. This can result in an enlarged amygdala, contributing to increased anxiety and emotional instability. Its interactions with the hippocampus and PFC are vital for managing stress's emotional and cognitive effects.

Neuroplasticity and Recover: Interventions like stress management techniques, physical exercise, and cognitive-behavioural therapy can help promote recovery. For example, mindful-

ness meditation and aerobic exercise can lower cortisol levels, support hippocampal growth, and enhance overall cognitive function.

Psychopathological Implications

The changes in brain structure and function caused by chronic stress are closely linked to several mental health issues, including depression, anxiety disorders, and post-traumatic stress disorder (PTSD). Chronic stress can worsen these conditions or even trigger their onset by affecting brain areas involved in mood regulation and stress response, such as the hippocampus, amygdala, and prefrontal cortex. As a result, individuals may experience long-term cognitive impairments, emotional instability, and a diminished ability to cope with future stressors.

Conclusions

The impact of stress on cognitive function and brain structure is profound and multifaceted. While acute stress can enhance certain cognitive abilities, chronic stress has a detrimental effect on memory, attention, decision-making, and executive function. Furthermore, prolonged exposure to stress hormones like cortisol leads to structural changes in the hippocampus, prefrontal cortex, and amygdala, areas critical for cognitive performance and emotional regulation. Understanding the biological mechanisms underlying these effects opens the door to potential therapeutic interventions aimed at mitigating the cognitive and structural consequences of chronic stress. Encouraging stress management practices and promoting neuroplasticity through lifestyle changes and interventions can help support brain health and cognitive function in the face of stress.

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G. Mahdavi

Scientific Supervisor: Ph.D., associate professor N. N. Usova

Educational Establishment
«Gomel State Medical University»
Gomel, Republic of Belarus

RETROSPECTIVE COMPARATIVE COHORT ANALYSIS OF PRE-STROKE HEALTH FACTORS AND THEIR EFFECT ON RECOVERY IN PATIENTS WITH HEMORRHAGIC AND ISCHEMIC STROKES

Introduction

Stroke is the most common neurological disorder and the third common cause of death in many countries. The stroke is divided into two major subtypes of ischemic and hemorrhagic, Given the risk of post-stroke death and the problems it has for the individual, and the community, despite advances in acute care, recovery outcomes vary significantly, highlighting the importance of pre-stroke health status [1].