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FEATURES OF BRAIN ANATOMY ITSELF

Annotation: The brain, contained in and protected by the skull and suspended in cerebrospinal fluid, is one of the most important and complex organs in the body. It is the central organ of the nervous system, and with the spinal cord makes up the central nervous system, which controls most of the activities of the body, processing, integrating, and coordinating the information it receives from the sense organs and determining the signals or instructions sent back to the rest of the body.

Key words: brain, nervus system, spinal cord.

At birth, the average brain weighs about 350 - 400grams, approximately 25% of the final adult brain weight of 1.4 - 1.45 kg and accounting for only 2% of overall body mass, which is reached between 10 and 15 years of age. Fastest growth occurs during the first 3 years of life, with almost 90% of the adult value reached by the age of 5 years. Its average width is about 140 mm, the average length is about 167 mm, and average height about 93 mm. While the brain continues to change throughout our life span, changes in brain morphology during childhood, adolescence and adulthood are much more subtle than those in the first 4 years of life. The rate and amount of growth that occurs in the brain after birth is neither constant nor pre-determined, nor is it protected from outside influences, both positive and negative, and as such can be speeded up and increased, or slowed down and decreased.

The cerebrum is the largest part of the brain. The surface of the cerebrum is composed of depressions or grooves (sulci) and ridges or raised areas (gyri), which increase the surface area of the cerebrum without an increase in the size of the brain. Grey matter, approximately 2 to 4 mm thick, forms the outer surface of the cerebrum, which processes and integrates information from white matter fibre tracts, which form the inner surface of the cerebrum. The cerebrum consists of two cerebral hemispheres, the right hemisphere and the left hemisphere, connected by the corpus callosum which facilitates communication between both sides of the brain, with each hemisphere in the main connection to the contralateral side of the body i.e. the left hemisphere of the cerebrum receives information from the right side of the body resulting in motor control of the right side of the body and vice versa. The Hemispheres are then further divided into four lobes. The frontal lobe is located at the front of the brain, occupying the area anterior to the central sulcus and superior to the lateral sulcus. It is associated with reasoning, motor skills, higher-level cognition and expressive language. At the back of the frontal lobe, near the central sulcus, lies the motor cortex. This area of the brain receives information from various lobes of the brain and utilises this information to carry out body movements. Damage to the frontal lobe can lead to changes in sexual habits, socialisation, and attention as well as increased risk-taking.

Area	Function	Dysfunction
Primary Motor Cortex	Voluntary Control of Movement	Altered Muscle Tone Poor Motor Control
Pre Motor Area	Selection of movement based on external events	Dyspraxia
Supplementary Motor Area	Selection of movement based on stored plans specified by internal cues. Involved in planning of motor actions.	
Pre-Supplementary Motor Area	Acquiring new sequences	Dyspraxia
Broca's Area	Left Hemisphere - Expression of Speech	Expressive Dysphasia
	Right Hemisphere - Non-Verbal Communication	
Pre-frontal Cortex	Personality and Behaviour	Changes in Character
		Inappropriate Behaviour
	Higher executive function - problem solving, initiation, moderation and termination of bevaiour.	Dysexecutive Syndrome

The cerebellum, sometimes referred to as the "Little Brain", is found inferior to the tentorium cerebella or tentorial membrane in the posterior cranial fossa, posterior to the fourth ventricle, the pons and the medulla oblongata. The cerebellum accounts for approximately 10 % of the brain's total size but has for more than 50 % of the total number of neurones located in the entire brain. It is the largest part of the hindbrain forming the Deep Cerebellar Nuclei, which consists of an outer layer cortical region with an inner subcortical mass of cells. It consists of two cerebellar hemispheres joined by a narrow median vermis and is connected to the posterior aspect of the brainstem by 3 cerebellar peduncles, which are symmetrical bundles of nerve fibres. The cerebellum is divided into three small lobes; anterior, middle and flocculonodular lobes, which receive information from the balance system of the inner ear, sensory nerves, and the auditory and visual systems.

The cerebellum is primarily involved in the coordination of movements as well as the learning of movements (motor learning) and has ipsilateral control of movement i.e. the left hemisphere of the cerebellum controls the left side of the body and vice versa. It regulates initiation, timing, sequencing, and force generation of muscle contractions, sequencing the order of muscle firing when a group of muscles work together to perform a movement and assists with balance and posture maintenance. While the cerebellum is associated with motor movement and control, motor commands do not originate here, rather the cerebellum serves to modify these motor commands it receives from sensory systems of the spinal cord and from other parts of the brain, and integrates these inputs to fine-tune motor activity in order to make motor movements accurate and useful. The cerebellum compares the intended movement originating from the motor cortex areas with the actual movement relayed back by the afferent systems and interneurons in the spinal cord. The main functions of the cerebellum are to;

1. **To act as a comparator**: comparing descending supraspinal signals with ascending afferent feedback. If there is any discrepancy, this is then fine-tuned to produce the actual movement desired via descending pathways. This helps to achieve smoothness and accuracy in movement.
2. **To act as a timing device**: it converts descending motor signals into a sequence of motor activation. This helps the movement achieve smoothness and coordination, maintaining posture and balance. (receiving input from the vestibular system).

3. **To initiate and store movement**: has the ability to store and update motor information. there is a significant role played inaccurate learned movement. This is due to a modifiable synapse at the purkinje cell.

Cerebellar damage produces disorders in fine movement, equilibrium, posture, and motor learning depending on the part of the cerebellum involved and how it is damaged.

References:

1. Salomov, S., Aliyev, H. M., & Rakhmanov, R. R. (2022). MORPHOMETRIC INDICATORS OF THE GROWTH OF THE THICKNESS OF THE LAYERS OF THE VISUAL CORTEX (FIELD 17, 18, and 19) OF THE LEFT AND RIGHT HEMISPHERES OF THE BRAIN IN A HUMAN IN POST-NATAL ONTOGENESIS. *Galaxy International Interdisciplinary Research Journal*, *10*(1), 875-878.
2. Izbosarovna, O. M. (2022). FLOWERING PLANTS USED IN LANDSCAPING WORK. *British Journal of Global Ecology and Sustainable Development*, *10*, 184-190.
3. Izbosarovna, O. M. (2022). CARE AND FEEDING OF CARP FISH. *British Journal of Global Ecology and Sustainable Development*, *10*, 108-113.
4. Ачилова, З. (2023). Словообразовательные и грамматические трудности при переводе испанского текста на русский. *Центральноазиатский журнал образования и инноваций*, *2*(6 Part 6), 220-224.
5. Ачилова, З. П. МЕТОДЫ ОБУЧЕНИЯ ПРИ ПЕРЕВОДЕ ПОЛИТИЧЕСКИХ ВЫСТУПЛЕНИЙ Эргашев Алишер Фарход угли.
6. Nozimjon o‘g, S. S., & Mahramovich, K. S. (2024). The Chemical Composition Of The White Carrak Plant And Its Medicinal Role. *Texas Journal of Medical Science*, *29*, 78-80.
7. АЧИЛОВА, З. LAS PARTICULARIDADES DE LA COMPETENCIA COMUNICATIVA DE LOS ESTUDIANTES.
8. Nozimjon o’g’li, S. S., & Makhmudovich, A. H. (2024). The Most Effective Drugs in the Treatment of Myocarditis Disease. *Health & Medical Sciences*, *1*(2), 6-6.