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SUBJECT : ANATOMY

ID : 15368

Q1: Write a comprehensive note on the blood supply of brain?

* **INTRODUCTION TO BRAIN:** human brain is the central organ of the human nervous system , and it makes central nervous system with spinal cord .the brain consist of the cerebrum ,the brain stem and the cerebellum. It controls most of the activities of body like
* **Processing**
* **Integrating**
* **Coordinating the information**

Brain is protected by hard skull bone of the head .The cerebrum is the largest part of the human brain .it is divided into two cerebral hemispheres. Each hemisphere is divided into four main lobes, that is

* Frontal lobe
* Parietal lobe
* Temporal lobe
* Occipital lobe
* The cerebral cortex is an outer layer of grey matter .covering the core of white matter .the cortex is split into the neo cortex and the much smaller allo cortex .
* The brain is protected by the skull laying in cerebrospinal fluid and isolated form the blood stream by the ( blood brain barrier) however the brain is still suspect able to damage ,disease and infection.
* We have right brain and left brain .the cerebrum is divided into two halves .The right and left hemisphere. They are joined with bundle of fibers called as ( corpus callosum ) . And transmit messages from one side to another. Each hemisphere controls the opposite side of the body. E.g if stroke occur on to your left side of brain so it will effect your right side of leg or arm **BLOOD SUPPLY OF BRAIN:** The blood is running in our body just by two ways and that is **arteries and veins.** Arteries carries oxygenated blood and veins carry deoxygenated blood and to get oxygenated the deoxygenated blood enter through pulmonary artery to heart and then get oxygenated in lungs and through pulmonary vein oxygenated blood is supply to left aorta of the heart And then is supply to the whole body .
* The brain receives arterial supply from two pairs of vessels
* **THE VERTEBRAL ARTERIES**
* **THE INTERNAL CAROTID ARTERY**

These two arteries going up to the cranial cavity and bifurcation occur their and become 1 artery .these arteries arises in the neck, and ascend to the cranium. With in the cranial vault the terminal branch of these arteries form an circle called as circle of Willis. From this circle branch raises with supply the majority of the cerebrum .

Other part of CNS such as **pons** and **spinal cord**  are supplied with smaller branches from the vertebral arteries.

**INTERNAL CAROTID ARTERIES:**  The internal carotid arteries originate at the bifurcation of the left and right common carotid arteries at the level of the fourth cervical vertebrae ( C4) .

* They move superiorly with in the carotid sheath ,and and enter the brain via the carotid canal of the temporal bone . They do not supply any branches to the face or neck .
* **OPHTHALMIC ARTERY:** supply the structure of the orbit .
* **POSTERIOR COMMUNICATING ARTERY :** act as anastomotic connecting vessel
* **Anterior choroidal artery :** motor control and vision
* **ANTERIOR CEREBRAL ARTERY :** supplies part of the cerebrum.

**VERTEBRAL ARTERIES:** The right and left vertebral arteries arises from the subclavian artery ,medial to the anterior scalene muscle . And ascend posterior to the neck ,through hole in the transverse process of the cervical vertebrae, known as foramen transversarium.

* The vertebral arteries enter the cranial cavity via foramen magnum .with in the cranial vault , some branches are
* Meningeal branch
* Anterior and posterior spinal arteries
* Posterior inferior cerebellar artery

**Venous drainage:**  the veins of the central nervous system frame deoxygenated blood from the cerebrum ,cerebellum and brain stem and spinal cord after emptying into dural venous sinuses .most cerebral venous blood flows into the internal jugular vein before it is return to the heart .

**Venous draining** is divided into

* Superficial vein
* Deep vein

The superficial veins primarily drain the cerebral cortex where as the deep vein drain the deep structure with in the hemisphere… the cerebral veins empty into the dural venous sinuses situated with in the subarachnoid space . The superficial system drains into the superior digital sinus while the deep system drain into the transverse straight and sigmoid sinuses .

**EXTERNAL CEREBRA VEIN :**

* **SUPERIOR CEREBRAL VEIN**  present into lateral surface of cerebral hemisphere drain into superior saggital sinus
* **SUPERFICIAL MIDDLE CEREBRAL VEIN**  present at lateral surface of cerebral hemisphere drain into cavemous sinus
* **DEEP MIDDLE CEREBRAL VEIN**  present in the insula joined by anterior cerebral and striated basal vein
* **Superior Anas vein**
* **Inferior Anas vein**

**INTERNAL CEREBRAL VEIN**

* THALMOSTRIATE and CHOROIDAL vein supply to the basal ganglia ,thalamus, internal capsule tela choroidea of 3rd ventricle, hippocampus drain into internal cerebral vein ,great cerebral vein , straight sinus and dural venous sinus .

**Q2: WHICH TYPE OF STROKE IS COMMON ? WRITE A COMPLET NOTE ON IISCHEMIC STROKE ?**

**INTRODUCTION TO STROKE :** stroke is a disease that effect the arteries leading with in the brain .it become cause of death or disability. A Stroke occur when a blood vessel that Carrie’s oxygen and nutrients to the brain is either blocked by a clot or bursts or ruptures.

* Most common stroke is ISCHEMI stroke. It is the most common type of stroke out of almost 80 percent of all stroke , is caused by a clot or other blockage within an artery leading to the brain

**INTRODUCTION TO ISCHEMIC STROKE:**

**ISCHEMIC stroke** is one of three types of stroke .its also referred to as brain ischemia and cerebral ischemia. This type of stroke is caused by a blockage. Reduces the blood flow and oxygen to the brain .leading to damage or death of brain cells .if circulation isn’t restored quickly, brain damage can be permanent .

* Approximately 87 percent of strokes are ISCHEMIC

**SYMPTOMS:** It depend on what region of the brain is affected .certain symptoms are common across stroke is :

* **VISION PROBLEM**  such as blindness
* **WEAKENESS OR PARALYSIS**
* **DIZZINESS AND VERTIGO**
* **CONFUSION LOSS OF COORDINATION DROOPING OF FACE ON ONE SIDE**

**CAUSES :** ISCHEMIC stroke occur when an artery that supplies blood to the brain is blocked by a blood clot or fatty buildup ,called plaque. The blockage can appear at neck or in the skull .

Clots usually starts in the heart and travels through the circulatory system.

ISCHEMIC stroke caused by a fatty buildup happens when plaque breaks off from an artery and travels to the brain . Plaque can also build up in the arteries That supply blood to the brain .and narrow those arteries enough to cause ischemic stroke .

**RISK FACTORS :**

* High blood pressure
* Atherosclerosis
* High cholesterol
* Arterial fibrillation
* Prior heat attack
* Sickle cell anemia
* Clotting disorders
* Congenital heart defects

**TREATMENT: The first goal of treatment is to restore breathing ,heart rate and blood pressure to normal .**if necessary, then will try to reduce pressure in the brain with medication.

**The main treatment for ISCHEMIC stroke is intravenous tissue plasminogen activator** which break up clots .

Q3: **WHAT DO U KNOW ABOUT THALEMIC NUCLEI OF BRAIN?**

* **INTRODUCTION TO THALMIC NUCLWI OF BRAIN :** it have strong reciprocal connections with the cerebral cortex, forming thalmo-cortico-thalmic circuits that are believed to be involved with consciousness. It ply major role in arousal the level of awareness, the activity. Damage to thalamus can lead to permanent coma.

**STRUCTURE AND FUNCTION:** the thalamus is a paired structure located in the center of the brain each side can divided into three groups ,a medical nuclear group ,and an anterior nuclear group and lateral nuclear group . These three groups get split by the internal medullary lamina ,a y shaped structure is present on each side of the thalamus. Reticular nucleus that covers each lateral thalamus

**Function of thalamus :** A major relay station for the cerebral cortex ,brain stem ,hypothalamus and basal ganglia .think of this structure as a processing center in the middle of the brain .alla the information coming to brain is first stored , integrated and analysed by the thalmi before it sent further .

The thalamus sorts out and interprets, to a certain extent, incoming sensory and motor information.

* It have an ability to control the information projected to and from the cerebral cortex ,thus affecting level of consciousness and alertness.
* It receives feedback ,being involved even in behavioral arousals and sleep- wake cycles.

**Grouping by anatomic location categorized by function**

**There are three categories :**

**1** . Relay nuclei ( lateral nuclear group ,medical nuclear group ,anterior nuclear group )

**2 . Reticular nucleus**

**3 . Interlaminar nuclei**

***1.Lateral nuclear group***:

* Ventral posterolateral nucleus
* Ventral posteromedial nucleus
* Lateral geniculate nucleus
* Medial geniculate nucleus
* Ventral lateral nucleus
* Ventral anterior nucleus
* Pulvinar
* Lateral dorsal nucleus
* Lateral posterior nucleus
* Ventral medial nucleus

2***. Medial nuclear group:***

* Mediodorsal nucleus

***3. Anterior nuclear group :***

* Anterior nucleus

**ANTERIOR PART :** it contain anterior thalamic nuclei . These nuclei receive information from the so called limbic system of the brain giving them important functions and influence upon emotional states and memory .

**MIDDLE PART :** it have a component Called as dorsomedial nucleus and it is subdivide into anteromedial magnocellular and posterolateral parvocellular

* The antero medial part communicate with several regions of brain .some fibers are one way communication others are afferent and efferent while other are 2 way

***LATERAL PART :*** the nuclei complex is the largest division and lies laterally to the internal medullary lamina.

**Q 4: WRITENOTE ON DESCENDING TRACTS OF SPINAL CORD ?**

**DESCENDING TRACTS OF SPINAL CORD:** The DESCENDING tracts are the motor pathways by which motor signals are sent from the brain to lower motor neurons.and then directly innervate muscles to produce movements .

**CORTICOSPINAL TRACT:** it originate in the motor cortex that’s located in pre central gyrus .Depending on where the the neuron originate with in the gyrus they will supply to different regions like legs the foots ,control by medial part of the gyrus .whereas the arms are control by the outer lateral surface.

**The sensory information received from the body by the somatosensory cortex .**

**CORTICOBULBAR TRACT :** RESPONSIBLE FOR THE INFLUENCING the motor nuclei of a number of cranial nerves including

* Oculomotor lll
* Trochlear lV
* Mandibular component of trigeminal V3
* Abducens Vl
* Facial Vll
* Glossopharyngeal lX
* Vague X
* Spinal accessory Xl
* Hypoglossal Xll nerves

Q5 : **NOTE ON AUTONOMIC SYSTEM .DIFF BETWEEN SYMPATHETIC AND PARASYMPATHETIC NERVOUS SYSTEM ?**

**INTRODUCTION TO AUTONOMIC SYSTEM :** The AUTONOMIC nervous system is a component of nervous system that regulate involuntary physiological process including heart rate ,blood pressure , respiration ,digestion and sexual arousal and contain three anatomically distinct divisions that is SYMPATHETIC, PARASYMPATHETIC and enteric .Two division of AUTONOMIC system are the SYMPATHETIC and PARASYMPATHETIC division

**SYMPATHETIC SYSTEM :**  it is activated in fight and flight response

It is frequently considered part of the peripheral nervous system although that lie within the central nervous systems

Through SYMPATHETIC ganglia SYMPATHETIC neurons of spinal cord communicate with peripheral SYMPATHETIC neuron .spinal cord SYMPATHETIC neuron are that’s why called as presynaptic neuron .in response to the stimulus it releases noradrenaline.

Prolonged activation can elicit release of adrenaline from the adrenal medulla

Binding to adrenergic receptor causes the effects seen during fight and flight response.

* These include pupil dilation
* Increased sweating
* increased heart rate
* Increase blood pressure

**PARASYMPATHETIC SYSTEM:**

**It is** responsible for the body rest and digestion response when the body is relaxed resting or feeding

It decreases respiration and heart rate and increases digestion .

Stimulation of PARASYMPATHETIC nervous system results in:

* Construction of pupils
* Decreases heart rate
* Decreases blood pressure
* Constriction of bronchial muscles
* Increase in digestion
* Increase production of saliva and mucus
* Increase in urine secretion