Date: 20/5/2014

Subject: Physiology

Lecture #54

-Welcome to sheet #54 let the fun begin.....eh!

**Hypothalamus:**

Today we are going to talk about the Hypothalamus:

Location: its is the smooth surface part of the subcortical region between the [corpus callosum](https://www.google.jo/search?es_sm=93&biw=935&bih=889&q=corpus+callosum&spell=1&sa=X&ei=u6x7U-_WFIm7ygO3goCIBw&ved=0CCMQvwUoAA) and the mid brain refer to slide#4

Physiologically we have three systems that mediate our response to internal and external stimuli either through Visceromotor (Autonomic) ,Endocrine (Hormonal) or Somatomotor. these systems stimulate the brain or directly our motor functions to change our internal environment based on the outer Environment or the situation we are in.slide#6

- **Functions of Hypothalamus(slide#3):**

Endocrine function

Caloric balance

Osmolarity balance

Thermal regulation

Autonomic balance

Sleep

Affective behavior

Memory

Somatic movements

Note: these functions are also related to the Limbic system.

**Anatomy of Hypothalamus :**

Anterior to posterior  **(**Slide #6) divided into: Preoptic area (Medial/lateral), Supraoptic region Tuberal region and the Mammillary region.

- Medial to lateral: periventricular zone, Medial zone and lateral zone

-notes:

* we will focus on medial zone since it contains the nuclei!
* the lateral zone mainly is a fiber bundle connecting the others.
* periventricular zone mainly involved in hormonal control with supraoptic and Arcuate?(not sure...)

**Preoptic Area contains:**

Medial nucleus: mainly involved in hormone secretion.

Lateral nucleus: involved with motor function connect

**Supraoptic region contains**:slide#14

suprachiasmatic nucleus :control sleep (circadian rhythms) (sleep/wake cycle)

supraoptic nucleus : oxytocin and vasopressin (ADH)secretion

Anterior nucleus: heat dissipation (when feeling hot and you need to decrease your body heat)

paraventreicular: involved with oxytocin and vasopressin (ADH)

**Tuberal region contains:**

Dorsomedial nucleus: "sham rage" means its involved with the anger feeling.

Ventromedial: Satiety center concerned with feeling full after eating a meal

Arcuate nucleus: releasing hormones and inhibiting hormones

**Mammillary region Contains :** (most posterior)

Mammillary nucleus : responsible for memory and learning since its part of the limbic system and the hypocampus and responsible for converting short term memory to long term memory

posterior nucleus: heat conservation (active when feeling cold and trying to conserve heat in our bodies).

**The Effect of Stimulation or Lesion of the Principal Hypothalamic Nuclei table (slide#17)**

|  |  |  |
| --- | --- | --- |
| Nucleus | Stimulation of | Lesion of |
| suprachiasmatic.n | Adjusts circadian rhythms | Abolishes circadian rhythms |
| supraoptic n.  Paraventricular. n | increased blood pressure | Diabetes insipidus |
| Lat.hypotha.n | Increased feeding | decreased feeding |
| Ventromedial n. | Decreased feeding | increased feeding |
| Dorsomedial n. | Sham rage | decreased aggression and feeding |
| Mammillary body | - | short-term memory is not processed into long-term memory |

-**Motor connection of hypothalamus (slide 13.)**

notes: we can train our brain to control the nuclei of hypothalamus to control feeling pain, temperature....etc due to the connection between the cortex and hypothalamus.

- **Videos Notes:**

- Gorilla video: video concerned with Attention where we focused on observing the white team number of passes while a a person in a gorilla suit (unexpected stimuli) walks by.

the experiment is done to show a phenomena called Inattentional blindness.

Inattentional blindness: is the failure to notice an unexpected stimulus (the Gorilla) that is in one's field of vision when other attention-demanding tasks are being performed. It is categorized as an attentional error and is not associated with any vision deficits. This typically happens because humans are overloaded with stimuli, and it is impossible to pay attention to all stimuli in one's environment. This is due to the fact that they are unaware of the unattended stimuli.

-Radiologist video: focus help us ignore distractions as 24 expert Radiologist focused on diagnosing x-ray scans in an experiment they failed to notice a gorilla image in the scans even when they looked directly at it which is a Reminder that we see in our brain! but how Does this video relate to us?

- well in the Dental field pain is not always a clear guide for Dental problems since we are going to face patients who complain of a pain (specially dull pain which is non localized) about certain tooth but its actually on totally different one

that’s why when we examine a patient we should not let our attention be mislead by the patient

note: pain rarely crosses from left to right so if the pain is on the left side its on that side.

THE End.

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Goodluck! =]