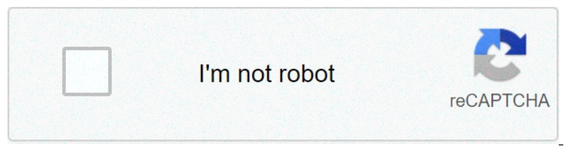

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The hypothalamus regulates the endocrine functions of the pituitary gland

By the end of this section, you will be able to: explain the interrelations of the anatomy and functions of the hypothalamus and the back and front lobes of the pituitary gland identify the two hormones released by the rear pituitary, their target cells, and Their main actions identify the six hormones produced by the front lobe of the pituitary gland, target cells, their main actions, and their adjustment from the hypothalamus the hypothalamusÃ ¢ pituitary complex can be thought as a center command Ã ¢ of the endocrine system. This complex secretes many hormones that directly produce answers in target tissues, as well as hormones that regulate the synthesis and secretion of other glands hormones. Furthermore, the hypothalamusÃ ¢ complex coordinate hypophyseals the messages of the endocrine and nervous system. In many cases, a stimulus received from the nervous system must pass through the hypothalamusÃ ¢ complex ipofisis be translated into hormones able to start an answer. The hypothalamus is a brain-resistor structure located front and lower than the thalamus (figure 1). It has both neural and endocrine functions, which produce and secrete many hormones. Furthermore, the hypothalamus is anatomically and functionally related to the pituitary gland (or hypophysis), a bean organ suspended from it by a stem called infidal bibus (or hypophyseal peduncle). The pituitary gland is lulled in the turkish saddle of the skull. It consists of two lobes that arise from distinct parts of the embryonic fabric: the rear pituitary (neuroipophysis) is neural fabric, while the front pituitary (also known as adenoipophysis) is glandular fabric that develops from the primitive digestive tract. The hormones secreted by the front and front pituitary, and the intermediate area between the lobes are summarized in the table A 1. Figure 1. The hypothalamus region is lower and prior to the Talamo. It connects to the pituitary gland by the foot peduncle similar infundobble. The pituitary gland consists of a front front and lobe, with each lobe they secrete different hormones in response to signals from the hypothalamus. Table 1. Hormone pituit hormones Lobo Associated hormone chemical hormone Effect Front of growth (GH) Protein promotes the growth of body tissues prola (PRL) Peptide promotes milk production from the mammary glands Anterior release of the stimulating hormone thyroid (TSH) Glycoprotein stimulating thyroid hormone by thyroid front adrenocortotropic hormone (ACTH) peptide stimulating hormone release from adrenal cortical front follicle-stimulating (FSH) glycoprotein stimulates gamete production gonads front hormone luteoinisant (LH) glycoprotein stimulates androgen production gonads rear hormone antidiuretic (ADH) Peptide Stimulates the reabsorption of water from the rear kidneys Oxytocin Peptide Stimulates uterine contractions during intermediate birth Zone Hormone Melanotropo Peptide Stimulates melanin in melanocytes Rear Pentuitary training The rear pituitary is actually a prolongation of the neurons of the paravertricol Are and Supraopt IC nuclei of the hypothalamus. The cellular bodies of these regions rest in the hypothalamus, but their axons go down as the hypothalamic ¢ pituitary stretch inside the infundible, and end in axon terminals that constitute the rear pituitary (Figure 2). Figure 2. Neurosecretory cells in the hypothalamus ossitocine (OT) or ADH release in the rear lobe of the pituitary gland. These hormones are stored or released in the blood through the capillary plexus. The rear pituitary gland does not produce hormones, but rather warehouses and secret the hormones produced by the hypothalamus. The parapery nuclei produce the hormone oxytocin, while the soultic nuclei produce ADH. These hormones travel along the axons inside Storage sites in in Rear pituitary axons terminals. In response to the signals themselves hypothalamic neurons, hormones are released from the assion terminals in the bloodstream. When oxytocin fetal development is complete, the hormone peptide derivative oxytocin (therapy- = Ã ¢ childbirthÃ ¢) stimulates uterine contractions and cervical expansion. During most pregnancy, oxytocin hormonal receptors are not expressed at high levels in uterus. Towards the end of pregnancy, the synthesis of oxytocin receptors in uterus increases, and the smooth muscle cells of the uterus become more sensitive to its effects. Oxytocin is released continuously during childbirth through a positive feedback mechanism. As noted above, oxytocin contractions uterine instructions pushing fetal head towards the cervix. In response, cervical stimulates extends additional oxytocin from synthesize from the hypothalamus and released by the hypophysis. This increases the intensity and effectiveness of uterine contractions and requests additional dilation of the cervix. The feedback ring continues until birth. Although the MotherÃ ¢ s high blood oxytocin levels begin to decrease immediately after birth, oxytocin continues to play a role in maternal and neonatal health. First, oxytocin is necessary for the reflection of milk emission (commonly referred to as a Let-Downa) in breastfeeding women. As the newborn starts from milk, sensory receptors in the transmission nipples signals to the hypothalamus. In response, oxytocin is secreted and released in the bloodstream. In a few seconds, cells in milk MotherÃ ¢ s contract conducts, expulsion milk in the mouth Infanta s. Secondly, in males and females, oxytocin is designed to contribute to parentÃ ¢ newborn bonding, known as an attachment. Oxytocin is also thought to be involved in feelings of love and closeness, as well as in sexual response. Antidiuretic hormone (ADH) The concentration of blood solute, or blood oxystery, can change in response to the consumption of some foods and liquids, as well as in response to the disease, injury, drugs, or other factors. Blood osmolarity is constantly monitored by specialized cells osmoreceptorsÃ ¢ within the hypothalamus particularly sensitive to the concentration of sodium ions and other solutes. In response to the high osmolarity, which can occur during dehydration or after a very salty meal, the osmoceptors report the rear pituitary to release the antidiuretic hormone (ADH). ADH target cells are found in kidney tubule cells. Its effect is to increase the epithelial permeability to water, allowing greater reabsorption of water. More water resorbed by the filtered, the greater the amount of water that is returned to the blood and less that is excreted in the urine. A greater concentration of water involves a reduced concentration of solutes. ADH is also known as vasopressin because, in very high concentrations, it causes bleed vessels constriction, which increases blood pressure by increasing peripheral resistance. The release of ADH is controlled by a negative feedback ring. As blood oxystery decreases, hypothalamic osmoceptors detect rapid variation and a corresponding decrease in ADH secretion. As a result, less water is reabsorbed by filtered in urine. It is interesting to note, drugs can affect ADH secretion. For example, alcohol consumption inhibits the release of ADH, resulting in increased urine production that can lead to dehydration and a hangover. A disapurement disapurement disapurement is characterized by chronic toh subproduction that causes chronic dehydration. Because little ADH is produced and secreted, not enough water is reabsorbed by the kidneys. Although patients feel thirsty, and Their consumption of liquids, this doesn't be effectively reducing the concentration of solour in their blood, because ADH levels are not high enough for trigger trigger water In the kidneys. The imbalances of electrolyte can occur in serious cases of insipid diabetes. Front pituitary The front pituitary originates from the digestive tract in the embryo and migra towards the brain during fetal development. There are three regions: Pars Distilis is the further, intermediate pars is adjacent to the rear pituitary, and the Pars Tuberalis is a slender Ã ¢ â,¬ Å "TubeÃ ¢ â,¬ envelop the infundibulum. Recall that the rear pituitary does not synthesize hormones, but simply stores them. On the contrary, the front pituitary produces hormones. However, hormone secretion from the front pituitary is regulated by two hormone classes. These hormones "secreti from the hypothalamus" are the released hormones that stimulate the secretion of hormones from the front pituitary and the inhibitous hormones that inhibit secretion. The hypothalamic hormones are secreted by neurons, but enter the front pituitary through blood vessels (figure 3). Inside the infundibulum is a capillary bridge that connects the hypothalamus to the front pituitary. This network, called the hypophysical portal system, allows you to transport hypothalamic hormones to the front pituitary without first inserting the systemic circulation. The system comes from the upper ipophysary artery, which branches out of carotid arteries and transports blood to the hypothalamus. The branches of the upper ipophysaria artery form the Hypofysal portal system (see Figure 3). Hypotalamic release and inhibiling hormones travel through a primary capillary plexus to the veins of the portal, which lead them into the front pituitary. The hormones produced by the front pituitary (in response to released hormones) enter a secondary capillary plexus, and to drain circulation. Figure 3. The front pituitary produces seven hormones. The hypothalamus produces separate hormones that stimulate or inhibit hormonal production in the front pituitary. Hormones from the hypothalamus reach the front pituitary through the ipophysical portal system. The front pituitary produces seven hormones. These are growth hormone (GH), the stimulating thyroid hormone (TSH), adrenocorticopic hormone (ACTH), the stimulating hormone of the follicle (FSH), the luteinizing hormone (LH), the beta Endorphine and prolactin. The front pituitary hormones, TSH, ACTH, FSH and LH are indicated collectively as tropical hormones (tropics - Ã ¢ â,¬ Ã "turningÃ ¢ â,¬) because the function of other endocrine glands light up or light. Growth hormone The endocrine system regulates the growth of the human body, protein synthesis and cellular replication. An important hormone involved in this process is the hormone of growth (GH), also called somatopinÃ ¢ â,¬ "a protein hormone produced and secreted by the front pituitary gland. Its primary function is anabolic; promotes protein synthesis and The construction of tissues through direct and indirect mechanisms (Figure 4). GH levels are controlled by the release of GHRH and GHIH (also known as somatostatin) from the hypothalamus. Figure 4. The growth hormone (GH) directly accelerates the rate of protein synthesis in skeletal muscles and bones. The insulin growth factor 1 (IGF-1) is activated by the growth hormone and indirectly supports the formation of new proteins â €

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