BIOS252 Week 6 Case Study: Endocrine System

Introduction recap

The anterior lobe of the pituitary gland, also known as the adenohypophysis, is an essential component of the endocrine system responsible for producing and secreting several hormones that regulate various physiological processes throughout the body. Here is a detailed description of the anatomy and physiology of the anterior lobe of the pituitary gland:

Anatomy:

1. **Location:** The anterior lobe of the pituitary gland is situated at the base of the brain within the sella turcica of the sphenoid bone, just below the hypothalamus.
2. **Structure:** It is composed of glandular tissue organized into distinct cell types, including somatotrophs, lactotrophs, corticotrophs, thyrotrophs, and gonadotrophs.
3. **Vascular Supply:** The anterior pituitary receives its blood supply from the hypophyseal artery, which branches off from the internal carotid artery. This rich vascular network ensures efficient delivery of hormones to the systemic circulation.

Physiology:

1. **Growth Hormone (GH):** Produced by somatotroph cells, GH plays a crucial role in stimulating growth, cell reproduction, and regeneration. It promotes longitudinal bone growth during childhood and maintains bone and muscle mass in adults.
2. **Prolactin (PRL):** Secreted by lactotroph cells, PRL regulates lactation by stimulating milk production in mammary glands after childbirth. It also influences reproductive function and behavior.
3. **Adrenocorticotropic Hormone (ACTH):** Synthesized by corticotroph cells, ACTH stimulates the adrenal cortex to produce and release cortisol, a stress hormone involved in regulating metabolism, immune function, and the body's response to stress.
4. **Thyroid-Stimulating Hormone (TSH):** Produced by thyrotroph cells, TSH stimulates the thyroid gland to synthesize and release thyroid hormones, including thyroxine (T4) and triiodothyronine (T3), which regulate metabolism, growth, and development.
5. **Follicle-Stimulating Hormone (FSH) and Luteinizing Hormone (LH):** Released by gonadotroph cells, FSH and LH regulate reproductive functions in both males and females. FSH stimulates the growth and maturation of ovarian follicles in females and spermatogenesis in males, while LH triggers ovulation, testosterone production, and progesterone synthesis.