

The Influence of Sex Glands on Human Psychology and Personality

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Abstract: This article examines the hormonal activity of the sex glands and their influence on human psyche and personality traits. The roles of hormones such as testosterone, estrogen, and progesterone in shaping emotions, behavior, temperament, and personality development are analyzed. The article highlights the interrelation between the endocrine system and the psyche within the field of medical psychology. Furthermore, it explores how hormonal changes during adolescence are associated with psychological crises in personality development, and how hormonal imbalances may contribute to mental conditions such as depression, aggression, or low self-esteem. The study also discusses diseases that may arise from dysfunctions of the sex glands.

Keywords: *sex glands, hormones, psychology, personality, endocrine system, testosterone, estrogen, temperament, emotional balance, adolescence*

Introduction

The harmonious functioning of each system in the human body determines not only physical health but also psychological well-being. Among these systems, one of the most significant is the sex glands. They influence not only reproductive processes but also have a profound impact on emotional state, temperament type, and personality formation. Recent research in the fields of psycho-neurology and endocrinology has revealed a direct relationship between sex hormones and mental stability.

For instance, a large-scale German study reported that at least one sexual dysfunction (such as erectile dysfunction or premature ejaculation) occurred in 33.4% of men and 45.7% of women within a year [1]. In the same study, cases in which sexual dysfunction was accompanied by emotional distress were found in 13.3% of men and 17.5% of women. Other sources also indicate that the prevalence of erectile dysfunction among men ranges between 25–30% [2].

Hormones secreted by the sex glands such as testosterone, estrogen, and progesterone affect the activity of the central nervous system, particularly through the hypothalamus and limbic system, which regulate emotional responses. Fluctuations in these hormone levels influence mood, behavior, motivation, and self-esteem. Therefore, endocrine imbalances are often considered contributing factors to various psychological disorders, including depression, affective instability, aggression, and apathy.

During puberty, the activation of the sex glands marks a crucial stage in personality development. Changes in the levels of estrogen and testosterone significantly affect an adolescent's emotional balance, self-confidence, and social behavior. Moreover, in women, hormonal fluctuations during the menstrual cycle may lead to mood swings, emotional sensitivity, and psychological discomfort.

This article analyzes the anatomical and physiological structure of the sex glands, the mechanisms of hormone secretion, and their effects on the central nervous system and human psychology. It also examines pathological conditions that may arise from hormonal imbalances and their influence on personality development.

Main body

The sex glands are the primary endocrine organs responsible for the production of hormones in the human body. In addition to regulating reproductive functions, these glands have a direct influence on psychological state. Known as gonads, they are classified as internal secretion glands, meaning that the hormones they secrete are released directly into the bloodstream. Their activity, anatomy, and mechanisms of hormone synthesis are closely interconnected with various body systems, representing the intersection between psychoneurology and endocrinology.

The anatomical structure of the sex glands reflects the complexity of the reproductive system. Functionally, these glands differ between sexes: in females, the main sex gland is the ovary, whereas in males it is the testis. In females, the ovaries are located along the fallopian tubes and measure approximately 3–5 cm in length. They are connected to the uterus via the fallopian tubes, positioned within the minor pelvis anteriorly adjacent to the pelvic cavity and urinary bladder, and laterally bordered by the ovarian artery and vein. In males, the testes, which produce testosterone, are located in the scrotum, an external organ designed to maintain an optimal temperature of 33–34°C for sperm production.

From a histological perspective, the parenchyma of the sex glands consists of specialized cells Leydig cells in the male testes, and granulosa and theca cells in the female ovaries. These cells synthesize steroid hormones such as estrogen, progesterone, testosterone, and inhibin. Steroid hormones are lipid-soluble, allowing them to pass through cell membranes, bind to intracellular receptors in the cytoplasm, and regulate gene expression within the cell nucleus.

These hormones perform a wide range of vital functions, including regulation of reproductive processes, development of secondary sexual characteristics, libido, bone density, muscle mass, tissue repair, and metabolic balance. For example, testosterone in males supports sperm synthesis and sexual drive, while estrogen in females regulates the menstrual cycle and maintains neural connectivity within the brain.

The biomechanisms of hormones also have a pronounced impact on the brain. Hormones particularly estrogen contribute to synaptic plasticity, neuronal longevity, and the antioxidant defense system within the brain. During menopause, when estrogen levels decline, mitochondrial activity decreases, neuroinflammation increases, and synaptic density is reduced, which can result in cognitive and memory impairments.

During the menstrual cycle, estrogen is predominantly produced in the ovaries at the initial (follicular) phase, leading to elevated levels that enhance mood, vitality, and social engagement. This occurs because estrogen stimulates the release of neurotransmitters such as serotonin and dopamine. However, if fertilization does not occur, the corpus luteum degenerates in the luteal phase, causing a sharp decline in both progesterone and estrogen. This hormonal drop often results in irritability, emotional sensitivity, mood swings, and psychological instability, a condition known as Premenstrual Syndrome (PMS) [3].

Sudden hormonal changes also affect the limbic system particularly the amygdala and hypothalamus — thereby intensifying emotional reactivity [4].

As a result, the female body attempts to restore hormonal balance; the endometrial layer of the uterus sheds, marking the process of menstruation. Once hormonal levels stabilize, a woman's mood

gradually returns to normal. This process vividly illustrates the influence of estrogen on human psychology.

Scientific studies have shown that estrogen supports neural connectivity in regions of the brain such as the frontal cortex, hippocampus, and cingulate gyrus [5].

When hormonal balance is disrupted, it can lead to various psychological conditions, including depression, anxiety, mood instability, and emotional reactivity. For instance, sexual dysfunction such as erectile dysfunction in men or reduced sexual desire in women is reported to occur in 43% of women and 31% of men within the general population. Moreover, research indicates that individuals with mood disorders are more likely to experience sexual dysfunction, suggesting a bidirectional relationship between these two conditions.

During puberty, hormone levels fluctuate dramatically testosterone and estrogen concentrations rise and begin to stabilize, testing an adolescent's emotional stability, self-confidence, social adaptation, and sexual identity formation. At this stage, both primary sexual characteristics (such as ovaries and testes) and secondary sexual traits (such as beard growth, voice deepening, and breast development) are actively formed.

From a pathological perspective, several disorders related to the function of sex glands are recognized, including hypogonadism, polycystic ovary syndrome (PCOS), premature menopause, sexual dysfunction, depression, bipolar disorder, psychosis, and Alzheimer's disease.

Conclusion

Every change in human behavior is not only a reflection of psychological shifts or external influences, but is also closely linked to hormonal activity. Hormones in the human body act as invisible regulators that govern not only physiological processes but also emotions, cognition, mood, and behavior.

The intricate relationship between the brain, the endocrine system, and the psyche causes individuals to experience different emotional states each day at times feeling energetic, inspired, and affectionate, while at other times indifferent, depressed, or irritable. These fluctuations do not represent "instability," but rather the body's natural biochemical rhythms.

Such variations occur differently in every individual. Among young people, these changes are often associated with the activation of newly functioning hormones, whereas in older adults, they reflect the gradual decline of long-established hormonal balance.

In men, testosterone, and in women, estrogen and progesterone, exert profound effects on the psyche influencing not only sexual desire, but also self-esteem, confidence, social activity, and emotional attachment.

Therefore, changes in mental and emotional state should not be viewed superficially as mere "mood swings" or "nervousness." Behind these fluctuations lies a complex biological foundation a delicate balance between hormones and neurotransmitters that underpins human psychological stability.

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