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Review article

Clinical significance of reproductive hormones

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ABSTRACT

Though a topic of speculation since the early ages, the true nature, mechanisms and functions of the reproductive hormones have been understood only fairly recently. The earliest known description was in the Sushruta in 1400 BCE, but it was not till the 17th century that the physiological processes involved started becoming lucid. Another few decades passed before experiments revealed the mechanism of action of these hormones. The reproductive hormones are secreted by the anterior pituitary gland as well as the gonads, and include both steroid and peptide hormones. It was elucidated that these reproductive hormones act through receptors whereby they alter transcriptional activation of target genes. Prolactin and the gonadotropin hormones i.e. Follicle Stimulating Hormone and Luteinizing Hormone are released from the anterior lobe of the pituitary gland. The major gonadal hormones include Estrogen, Progesterone and Testosterone and the placental hormone, Human Chorionic Gonadotropin. Recently, the Anti-Mullerian Hormone has been included as a unique marker of gonadal function. Testing of these hormones provides significant insight into the underlying pathology and can thus be highly useful in aiding clinical decisions; however, interpreting the results can be challenging. In view of the intricate mechanisms and complex interactions of the reproductive hormones, this review aims to highlight briefly, the physiology, metabolism and the most important clinical aspects of these hormones, to facilitate their optimal utilization in clinical practice.

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1. Introduction

Reproductive physiology has been a topic of speculation since the early ages but the reproductive hormones, their true nature, mechanisms and functions have been understood only fairly recently. The earliest known description was in the Sushruta in 1400 BCE, where menstruation was explained as the impurity of the seven body elements, while pregnancy was the result of the union of this fiery blood with semen. The same scripture also

recommends “testis tissue for impotence”. It was not till the 17th century that the physiological processes involved started becoming lucid. Theodor Kerckring (1638–1693), who is famous for his “Spicilegium Anatomicum”, stated that the ovum is expelled by the onset of menstruation.¹⁻³

Eugen Steinach, an Austrian physiologist, and his colleagues were the first to study the effects of steroid hormones on sexual behavior in rats – an experiment that gained him the status of the pioneer in reproductive neuro-endocrinology. His discovery of the

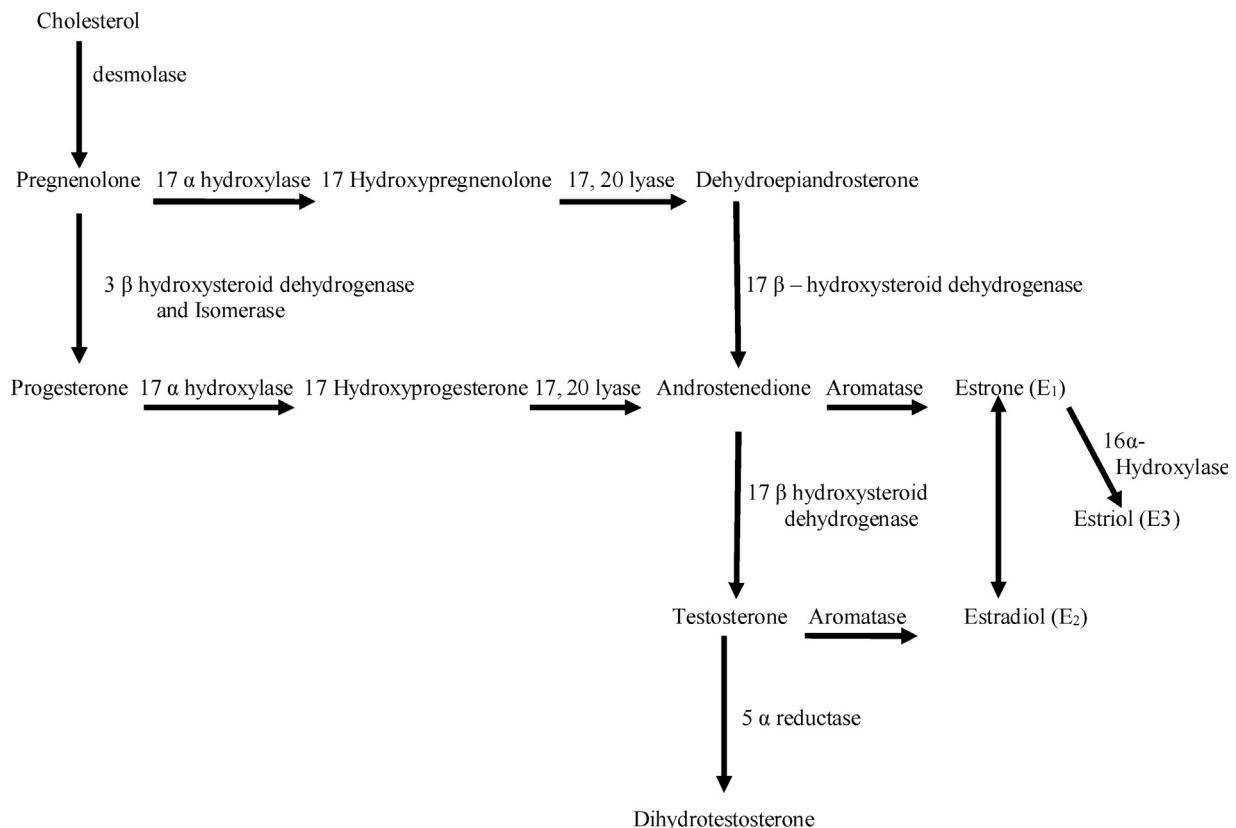


Fig. 1. Pathways involved in the biosynthesis of reproductive hormones.

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