Orexin and male reproduction

ABSTRACT

Orexins (or hypocretins) are hypothalamic neuropeptides with a multitude of physiological functions. They occur in two known forms, namely, orexin A and orexin B with a common precursor, preproorexin. The orexin receptors (orexin 1R and orexin 2R) belong to the Family of G-protein coupled receptors. The primary function of the orexin system, i.e. the orexins, their receptors and associated neuronal circuitries, perhaps is to increase spontaneous physical activity and food intake, thereby promoting an increase in energy expenditure. Reports suggest that orexins may be the key brain components to mediate the mechanism of obesity resistance. Recent research also has thrown lights upon a significant role of orexins, especially orexin A, in regulation of male reproductive functions owing to their receptor expressions in vital testicular cells, such as Leydig cells, Sertoli cells as well as spermatozoa at different developmental stages, even in the epididymis and penis. Moreover, orexins have been reported to greatly influence gonadotropin-releasing hormone neurons and their secretions to regulate reproductive functions via modulation of the hypothalamic-pituitary-gonadal axis. Evidence thus implicates participation of orexins in steroidogenesis, spermatogenesis, transportation and maturation of sperm as well as in the control of penile function. However, further research is required in this direction to elucidate the mechanisms by which orexins play a role in different testicular functions and effect of orexins on semen quality.

Keyword: Obesity; Orexin; Testis; Steroidogenesis; Spermatogenesis