Plasma Corticosterone and Leptin Concentration in Male and Female Rats: Debatable Facts

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Received: 1 Aug. 2012; Accepted: 5 Jan. 2012

We read with interest the recently published an article entitled "The comparison of the effects of acute swimming stress on plasma corticosterone and leptin concentration in male and female rats" by Parvin Zareian *et al.* (1). This article explained the relationship between the plasma corticosterone and leptin level in both sexes of the acute swimming stress rats. Interestingly, there were changes in the plasma leptin level; however, it did not correlate with the plasma corticosterone. Plasma leptin also is not sex dependent. Therefore, we take this opportunity to share some important scientific facts on the published article.

According to earlier researchers, hypothalamic-pituitary-adrenal axis (HPAA) was activated in response to stress stimulus and caused an increase in the corticosterone level which increased leptin secretion from white adipose tissue (2), High plasma leptin exert an inhibitory effect on the HPAA by inhibiting the corticotrophin releasing factor (CRF) released, and it does not directly inhibit adenocorticotrophin (ACTH). The CRF also activates the sympathetic, serotonergic and catecholamines systems and all of these systems have potential to inhibit food intake and reduce body weight (3). Therefore, inhibitions of the CRF by leptin will increase body weight and lead to obesity. Additionally leptin acts in a negative feedback loop to inhibit further expression of the leptin gene (4).

It would be interesting to observe any change in results due to the temperature of water to which the rats were exposed for swimming. Temperature control in the body of any animal is governed by higher centres in brain. This can also influence the stress level.

Leptin released from adipocytes reaches the brain and stimulates the release of the neurotransmitter neuropeptide Y which acts to stimulate physical activity in the rodents (4). In other words, the secretion of leptin from the adipocytes may be needed for the rodents in order to be able to swim. Therefore, the increases of plasma leptin level in the swimming rats stimulates the rats to swim compared to the control rats. Overall, an interesting article for which authors and editor in special need to be applauded.

References

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