



The role of cortisol in erectile function

David W. Barham[^]

Department of Urology, University of California, Irvine, Orange, CA, USA

Correspondence to: David W. Barham, MD. Department of Urology, University of California, Irvine, 333 City Blvd West, Suite 2100, Orange, CA, USA. Email: dwbarham14@yahoo.com.

Comment on: Rahardjo HE, Becker AJ, Märker V, *et al.* Is cortisol an endogenous mediator of erectile dysfunction in the adult male? *Transl Androl Urol* 2023;12:684-9.

Keywords: Erectile dysfunction; cortisol; psychogenic

Submitted May 17, 2023. Accepted for publication Jul 05, 2023. Published online Jul 18, 2023.

doi: [10.21037/tau-23-289](https://doi.org/10.21037/tau-23-289)

View this article at: <https://dx.doi.org/10.21037/tau-23-289>

Rahardjo and colleagues present a very interesting and thought-provoking study evaluating cortisol levels at different phases of the sexual response cycle (1). The authors enrolled 54 healthy males and 45 men with erectile dysfunction (ED) and measured cortisol levels in the systemic circulation (cubital vein) and within the corpora cavernosum. They should be commended for taking on this important work as it is no small feat to enroll almost 100 men to have blood sampled from the corpora cavernosum at multiple points throughout the sexual response.

The authors then compared cortisol levels measured from the cubital vein and corpora cavernosum during flaccidity, tumescence, rigidity, and detumescence in both healthy men and those with ED. I found the results of the healthy men to be most interesting. In this cohort, cortisol levels dropped significantly in systemic circulation (13.2 from 14.8 $\mu\text{g}/\text{dL}$, $P < 0.05$) and corpora cavernosum (13.3 from 14.8 $\mu\text{g}/\text{dL}$, $P < 0.05$) with the onset of an erection. Following loss of the erection, cortisol remained unchanged in systemic circulation, but further dropped in the corpora cavernosum. As the authors note, there is conflicting data on the role of cortisol and adrenocorticosteroids on erectile and sexual function. Some animal studies suggest cortisol levels are higher during sexual activity (2,3), while human studies suggest an inverse relationship between cortisol and sexual function (4,5). The findings of this study demonstrate that cortisol levels drop during the initiation of the sexual response in healthy men. The exact mechanism for this

change in cortisol levels is unclear and may be the result of increased activity of the parasympathetic nervous system and down regulation of the hypothalamic-pituitary-adrenal axis rather than a specific biochemical role of cortisol in the corporal tissue. Additionally, the further decrease of cortisol with detumescence within the corpora cavernosum is likely the result of increased venous drainage from the penis allowing washout of the cortisol levels rather than local degradation or use of cortisol. However, further study is necessary to delineate the biochemical role of cortisol on erectile function.

The authors also found that there was no significant difference in systemic or cavernosal cortisol levels in men with ED throughout the sexual response cycle. However, the starting level of cortisol in the men with ED was lower than healthy controls (cubital vein: 9.2 *vs.* 14.8 $\mu\text{g}/\text{dL}$; corpora cavernosum: 9.3 *vs.* 15.8 $\mu\text{g}/\text{dL}$). On the surface this may suggest a relationship between ED and cortisol levels; however, the men with ED were significantly older (52 *vs.* 25 years) which is very likely a confounder in these results as the authors state. Further work using matched groups may help overcome these limitations and improve our understanding of the relationship between cortisol levels and ED.

Despite the limitations in the interpretation of the data, this is the first study to examine both systemic and corporal cortisol levels throughout the sexual response in both healthy men and those with ED. Their results

[^] ORCID: [0000-0001-6369-4423](https://orcid.org/0000-0001-6369-4423).

support a decrease in cortisol levels with the initiation of the sexual response in healthy men. These findings support a biochemical theory for psychogenic ED. In men with psychogenic ED, stress levels are increased. Thus, one would expect cortisol levels to be elevated in these men. In these patients, cortisol levels may not be able to be suppressed or decreased due to persistent sympathetic output, further inhibiting erectile function. These results may be used by providers counseling men with psychogenic ED, that there is a biochemical rationale for their sexual dysfunction and it is not “all in their head” as the name psychogenic suggests. Future studies evaluating cortisol levels in men with psychogenic ED and age matched controls would help validate this theory. Nevertheless, the authors should be congratulated on their work and provide this meaningful contribution to the literature.

Acknowledgments

Funding: None.

Footnote

Provenance and Peer Review: This article was commissioned by the editorial office, *Translational Andrology and Urology*. The article did not undergo external peer review.

Conflicts of Interest: The author has completed the ICMJE uniform disclosure form (available at <https://tau.amegroups.com/article/view/10.21037/tau-23-289/coif>). The author has no conflicts of interest to declare.

Ethical Statement: The author is accountable for all

aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Open Access Statement: This is an Open Access article distributed in accordance with the Creative Commons Attribution-NonCommercial-NoDerivs 4.0 International License (CC BY-NC-ND 4.0), which permits the non-commercial replication and distribution of the article with the strict proviso that no changes or edits are made and the original work is properly cited (including links to both the formal publication through the relevant DOI and the license). See: <https://creativecommons.org/licenses/by-nc-nd/4.0/>.

References

1. Rahardjo HE, Becker AJ, Märker V, et al. Is cortisol an endogenous mediator of erectile dysfunction in the adult male? *Transl Androl Urol* 2023;12:684-9.
2. Borg KE, Esbenschade KL, Johnson BH. Cortisol, growth hormone, and testosterone concentrations during mating behavior in the bull and boar. *J Anim Sci* 1991;69:3230-40.
3. Veronesi MC, De Amicis I, Panzani S, et al. PGF(2 α), LH, testosterone, oestrone sulphate, and cortisol plasma concentrations around sexual stimulation in jackass. *Theriogenology* 2011;75:1489-98.
4. Kobori Y, Koh E, Sugimoto K, et al. The relationship of serum and salivary cortisol levels to male sexual dysfunction as measured by the International Index of Erectile Function. *Int J Impot Res* 2009;21:207-12.
5. Derouet H, Lehmann J, Stamm B, et al. Age dependent secretion of LH and ACTH in healthy men and patients with erectile dysfunction. *Eur Urol* 2002;41:144-53; discussion 153-4.

Cite this article as: Barham DW. The role of cortisol in erectile function. *Transl Androl Urol* 2023;12(8):1213-1214. doi: 10.21037/tau-23-289