Annals of General Psychiatry

BioMed Central

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Ethnicity, steroid hormones, and pain perception

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from International Society on Brain and Behaviour: 3rd International Congress on Brain and Behaviour
Thessaloniki, Greece. 28 November – 2 December 2007

Published: 17 April 2008

Annals of General Psychiatry 2008, **7**(Suppl 1):S260 doi:10.1186/1744-859X-7-S1-S260

This abstract is available from: http://www.annals-general-psychiatry.com/content/7/S1/S260

Background

The purpose of this study was to examine the relationship of steroid hormones to pain sensitivity in African Americans (AAs) and non-Hispanic Whites (nHWs).

Materials and methods

Ninety-one medically healthy men (24 AAs, 21 nHWs) and women in the late follicular phase of their menstrual cycles (26 AAs, 20 nHWs) were tested for voluntary threshold and tolerance to ischemic (IS), thermal heat (TH), and cold pressor (CP) pain. Blood was sampled after a rest period for serum testosterone and progesterone (females).

Results

In nHW men testosterone was directly related to IS threshold and TH tolerance (rs = +.61 and +.56, ps <.05). In nHW women testosterone was inversely related to IS threshold (r = −.45, p <.05). In nHW women progesterone was also inversely associated with IS tolerance and TH threshold and tolerance (rs = −.44 to −.56, ps <.05), and IS threshold (r = −.41, p <.06). There were no relationships between pain sensitivity and testosterone or progesterone in AAs.

Conclusions

This is the first study in humans to document a relationship between testosterone and pain sensitivity, which may be mediated by neuroactive metabolites of testosterone [1]. The relationship between progesterone and pain sensitivity in nHW women may explain findings on menstrual cycle and pain sensitivity [2,3], and also fits with our previous report that increased allopregnanalone, a neuroactive metabolite of progesterone, is associated with increased pain sensitivity [4]. The results suggest ethnic and gender differences in putative steroid hormone regulation of pain perception.

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