



SJSM Science

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Can symptoms of premenstrual syndrome be objectivized using autonomic nervous system testing?

Are female complains during the “certain period of month” justified? Thousands of jokes made on PMS shows that both men and woman are curious to know the answer – probably because both gender sometimes feel miserable victims of PMS. More than 60 instruments have been used for symptoms recording and still a single favorable method for the measurement and the detection of physical changes is missing.

A group of SJSM students tried to find out:

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(Paper presented at the Science day, Bonaire, Dutch Caribbean, May 8, 2012)

CAN SYMPTOMS OF PREMENSTRUAL SYNDROME BE OBJECTIVIZED USING AUTONOMIC NERVOUS SYSTEM TESTING?

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Objective:

- Examine autonomic nervous system (ANS) changes in healthy females with/without premenstrual syndrome (PMS).
- Determine what part of ANS (sympathetic – SANS or parasympathetic – PANS) is involved.
- Correlate PMS symptoms and ANS changes.

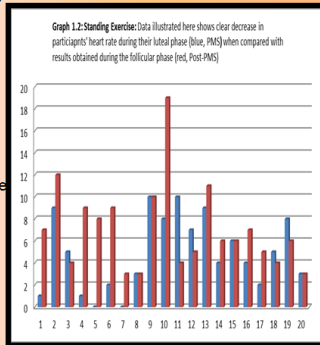
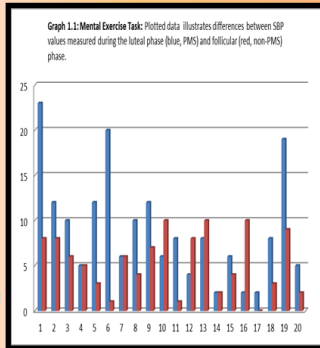
Background:

Most women of child-bearing age have symptoms related to normal ovulation, but medical definitions of PMS refer to a consistent pattern of emotional and physical symptoms occurring only during the luteal phase of the menstrual cycle (5-11 days before menstruation) that are of sufficient severity to interfere with some aspects of life. Our hypothesis was that almost all PMS symptoms could be associated with or even attributed to verifiable ANS changes.

Material and methods:

Twenty healthy medical students between the ages of 23 and 38 filled the Daily Symptom Rating Scale and underwent Ewing and Clarke short test battery during their follicular and luteal phases of menstrual cycle:

- (1) Resting BP and HR,
- (2) HR variation with deep breathing,
- (3) BP and HR response on mental arithmetic challenge,
- (4) BP and HR response on handgrip
- (5) BP and HR response to standing (lying/standing position).



Results:

- Questionnaire differentiated 3 groups of subjects with mild, modest and pronounced objections before as well as after the period.
- The intensity of objections did not determine whether a subject has PMS: only 4 subjects satisfied criteria for PMS.
- Subjects without significant differences in symptoms before and after menstruation had no significant differences in ANS tests.
- Statistically significant changes emerged in SBPs during the mental exercise task in luteal phase when compared to SBPs obtained in the follicular phase (SANS and central integration processes tests) (Graph 1.1).
- Heart rate values measured during the luteal phase were significantly lower than those observed during the follicular phase (PANS test) (Graph 1.2).
- Further, motor (handgrip) and cognitive mental integration processing differ during follicular and luteal phases of menstrual cycle in healthy females.

Discussion:

To our knowledge, no previous research evaluates ANS changes during PMS using the full Ewing's Battery. As such, observed changes in our study are the result of a wide array of tests that aim at reliably evaluating autonomic nervous system changes in a valid, comprehensive way.

Conclusion:

Regardless of the presence or absence of PMS, subjects had ANS changes before and after menses. This further emphasizes the role of hypothalamic hormonal, behavioral and ANS control during the cycle as well as the need for additional research. Particularly, the involvement of central integrative mechanisms present the challenge for future investigations.



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Mentor: Branka Filipovic, MD

Selected readings:

- Dickerson, L. M., Mazyck, P. J., Hunter, M. H. (2003, Apr 15). Premenstrual syndrome. 2003; 67(8): 1743-1752 <http://www.touchneurology.com/articles/diagnosing-autonomic-nervous-system-disorders-existing-guidelines-and-future-perspectives?page=0%2C2>
- Matsumoto, T., Ushiroyama, T., Morimura, T., Moritani, T., Hyashi, T., Suzuki, T., Tatsumi, N. (2006). Autonomic nervous system activity in the late luteal phase of eumenorrheic women with premenstrual symptomatology. US National Library of Medicine National Institute of Health. 27(3): 131