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A preliminary report relating frequency of vaginal intercourse to heart rate variability, Valsalva ratio, blood pressure, and cohabitation status

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Abstract

The relationship between recalled frequency of penile-vaginal intercourse (FSI) and resting heart rate variability (HRV; an index of parasympathetic tone), resting diastolic blood pressure (DBP) and heart rate (HR) response to the Valsalva maneuver was examined in 51 healthy adults aged 20–47 (subjects scoring above the 86th percentile on the Lie scale of the Eysenck Personality Inventory (EPI) were excluded). As hypothesized, greater HRV and lower DBP were both associated with greater FSI (but not masturbation or non-coital sex with a partner) in cohabiting subjects, but not in non-cohabiting subjects. Valsalva ratio was unrelated to sexual behavior. Results are discussed in terms of both the modulating role of blood pressure on a number of psychological functions and the role of parasympathetic tone in HRV, FSI, and possibly pair-bonding.

Keywords: Blood pressure; Heart rate variability; Vaginal intercourse; Sexual behavior; Valsalva

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1. Introduction

The correlates of frequency of penile-vaginal intercourse (FSI) have been extensively reviewed (Brody, 1997a), and include neuroendocrine, autonomic and sensory factors as well as positive health indices. Although many researchers have treated intercourse and other sexual behaviors as equivalent, there are important psychological and physiological differences between the potentially reproductive sexual act and others (Brody, 1997a).

Diastolic blood pressure (DBP) and heart rate variability (HRV) are cardiovascular indices of autonomic tone which have bearing on several sensory and interpersonal phenomena. The Valsalva ratio measures heart rate (HR) reactivity to the Valsalva maneuver (see Brody et al., 1999), and reflects a mixture of mechanical and broad autonomic factors. The present study examines the relationship of DBP, HRV, Valsalva ratio, and cohabitation status (affecting sexual partner access) to FSI, and contrasts FSI with other sexual behaviors.

HRV is a measure of vagal parasympathetic activity, and is often assessed by the standard deviation (S.D.) of resting HR (Kristal-Boneh et al., 1995). Although some researchers use frequency domain (spectral) analyses of HRV, the more readily understood time domain measure appears to provide an accurate measure of vagal tone (Hayano et al., 1991; Sacknoff et al., 1994). Orienting and attentional aspects of vagal activity and HR variability fit with findings that poorer attention to sexual activity is associated with less sexual arousal (Dekker and Everaerd, 1988). In a comparison with normals, reduced HRV discriminated half the cases with erectile dysfunction (Daffertshofer et al., 1994). Porges (1998) proposes the two brain regions activating the vagus have different functions, one vegetative, and the other related to attention, emotion, and communication processes that contribute to pair bond formation and to love.

Given the association of HRV with attention, emotional reactivity, less sexual dysfunction, and the role of parasympathetic tone in sexual arousal, it was hypothesized that for persons with potentially daily access to a partner (cohabitants), but not for those with intermittent access (non-cohabitants), HRV would be positively associated with FSI, but not other sexual activity.

BP is associated with pain threshold (Ghione, 1996), although the effects vary by pain modality (Rau et al., 1994). Baroreceptor-mediated analgesia is not generally manifest (subjectively or indexed by somatosensory evoked potentials) in persons with lower DBP (Brody et al., 1997). Given that sexual intercourse is a potent source not only of pleasure, but analgesia as well (Brody, 1997b), it was hypothesized that for cohabitants but not non-cohabitants, lower DBP would be associated with greater FSI, but not with other sexual activity.

An opportunity to perform a preliminary test of these hypotheses was presented by data collected in a study of the Valsalva maneuver and intraocular pressure (Brody et al., 1999). The use of the Valsalva maneuver also gave us the opportunity to follow up a report by Campese et al. (1982) that the Valsalva ratio was correlated with FSI in a sample of uremic men. It was hypothesized that the Valsalva ratio would be associated with FSI (but not other sexual behavior) in cohabitants but not non-cohabitants.