Prepulse Inhibition of the Cardiovascular Startle Reaction

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Methods

Subjects:
N=16 (female, age M=25±1 yrs., BMI M=20.6±0.5 kg/m², right-handed, healthy, without acute medication, in the luteal phase of the menstrual cycle)

Experimental setup:

Acoustic stimulation:
- Startle stimulus: 103 dB, white noise, 50 ms, instantaneous rise time, binaural - presented 64x
- Prepulse: 75 dB, 1200 Hz Sinus, 50 ms, Stimulus Onset Asynchrony = 120 ms, binaural

Skin perfusion measurement:
- Laser-Doppler Flowmetry (LDF)
- Perfusion: movement of blood cells; measured by pointing a laser beam at the tissue, perfusion unit: flux

Objective

Startle elicits an increase in skin conductance as well as changes in heart rate, blood pressure and skin perfusion [1]. It has been clearly demonstrated that startle-induced blinking and electrodermal responses can be inhibited when weak stimuli precede the startle stimulus (prepulse inhibition, PPI)[2].

The aim of the current study was to investigate whether prepulses have an effect on the startle responses of the cardiovascular system, especially of skin perfusion.

Results

- Significant inhibition (p-value; paired t-tests; at peak-response) of heart-rate (p = .004), blood pressure (systolic: p = .1, diastolic: p = .07) and skin perfusion (p = .01), when the startle stimulus was preceded by a prepulse (see fig. 3)

Conclusions

- These findings indicate a prepulse inhibition of the cardiovascular (blood pressure and heart rate) startle response and skin perfusion.
- Results can be interpreted in opposition to Lacey's "environmental intake-rejection" hypothesis [1].

References


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