Synopsis of Original Research Paper

The effects of fragrance on the autonomic nervous system using pupillary oscillation and heart rate variability

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This study aims to evaluate the effects of fragrance on the autonomic nervous system using pupillary oscillation and heart rate variability. Participants included 22 healthy young adults (mean age 21.8±1.4 years, 11 females). The experiment was performed for 5 minutes, and pupillary oscillation and heart rate variability were measured. We analyzed 1 minute of rest (rest), 1 minute of olfactory stimulation with lavender or grapefruit essential oil (olfactory stimulation), and up to 3 minutes after stimulation for residual effects (1, 2, and 3 mins after stimulation).Pupillary oscillation was measured with an infrared pupilometer ET-200 (Newopto) and heart rate variability was measured with a Reflex Meijin system (Crosswell). Pupillary oscillation data were subjected to frequency analysis, and the power spectrum was obtained. To measure heart rate variability, high (HF) and low frequency (LF) components were determined, and cardiac parasympathetic nerve indices (HF, HFnu) and cardiac sympathetic nerve indices (LF/HF, LFnu) were calculated. Regarding pupillary oscillation, the power spectrum of 0.25 Hz increased accordingly with the increase of the cardiac parasympathetic index. Regarding heart rate variability, lavender essential oil increased HF and HFnu and grapefruit essential oil decreased HF 3 mins after stimulation. The fragrances produced changes in pupillary oscillation and heart rate variability, which may be useful as objective evaluation indices of autonomic function.