

ALTERATIONS IN VOLATILE ORGANIC COMPOUNDS (VOCs) AS AN EFFECT OF SENSORIAL STIMULATION

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The real time exhaled volatile organic compounds (VOCs) have been suggested as a new biomarker to detect and monitor physiological processes in the respiratory system. The VOCs profile in exhaled breath reflects the biochemical alterations related to metabolic changes, organ failure, neuronal dysfunction in disease and neural activity, which are, at least in part, transmitted via the lung to the alveolar exhaled breath. In several studies, breath analysis has been applied to investigate cancer, lung failure and neurodegenerative diseases. Conversely, no studies exist on the real time monitoring of VOCs in sensorial stimulation in healthy subject. In the present study we investigated, in real time, the breath parameters and exhaled VOCs in humans during sensorial stimulation: smell, earing, vision and pain. VOCs variations of twelve volunteer by using an iAQ-2000 sensor to sensorial stimulations were recorded. We found a significant effect of sensorial stimulation, ANOVA $p < 0.05$. In particular, olfactory stimulation is the most effective sensorial stimulus that elicits greater VOCs variations in the exhaled breath. Because the olfactory system is driven directly towards the hypothalamus and limbic system structures, while other senses project first into the thalamus area and later re-project to other brain respective areas. This distinctive circuitry suggests the importance of olfaction, and chemoreception, in regulate lung gas exchange. VOCs variations during sensorial activation are putative key indicators of neural activity.