

Gamma Band Oscillations and Real-Time Breath Gas Monitoring Using Artificial Noses in An Intravenous Olfaction Test

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Most clinical olfactometry is a psychological test, and electrophysiological tests are rare. To develop clinically objective olfactometry, the applicability of intravenous olfactory-elicited gamma band oscillation (GBO) was investigated. The GBO was elicited by intravenous olfactory activation by thiamine propyldisulphide (Alinamin, Takeda Pharmaceutical Company, Osaka, Japan). Intravenous olfaction occurred because of odorous breath gas caused by an intravenously administered odorant. The breath gas was monitored by an odor meter using artificial noses (FPO-II, Futaba Electric, Yokohama, Japan). Odorant intensity in the breath gas was increased after the administration of Alinamin. GBO was also observed after the administration of alinamin. The change in GBO amplitude was similar to the change in odorant intensity until the first peak of odorant intensity after the administration of Alinamin. After the first peak, GBO amplitude still increased in one subject but decreased in another. Although GBO was thought to correlate to the intensity of an odorant in breath gas (IOBG), the difference in olfactory fatigue among subjects seemed to affect the difference in GBO. Measuring GBO combined with IOBG monitoring provides a method to analyze the relationship between olfactory response and for real-time odorant intensity in the nasal cavity. This seems a useful method not only for basic but also for clinical research and even suggests ways to improve the artificial nose.

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