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DELTA AND GAMMA EEG BANDS AS MARKERS OF LEFT HYPOFRONTALITY FOR LANGUAGE IN SCHIZOPHRENIA PATIENTS

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Objectives: Spectral delta and gamma activity were recorded in 17 schizophrenia patients and 17 matched controls to study brain dysfunction/inhibition and functional linguistic impairment in different phases of written word processing.

Methods: Most of patients were suffering from paranoid schizophrenia and obtained relatively high rating in Delusions (P1) and Conceptual disorganization (P2) of the PANSS. Delta and gamma amplitudes were measured while participants performed three linguistic tasks, i.e., visuo-perceptual, rhyming and semantic judgment.

Results: Compared with healthy controls, patients showed no overall delta and gamma differences, revealing a lack of pharmacological-dependent impairment. However, ANOVAs revealed bilateral delta and gamma distributions in patients and, compared with controls, significant greater delta and lower gamma levels in left anterior sites. Healthy participants showed higher delta amplitude in right vs. left anterior sites and a reversed pattern for gamma amplitude: delta and gamma provided complementary results which suggested that controls, but not patients, activated left anterior regions during the linguistic processing. Patients' hypofrontality was functionally correlated to their lack of left hemispheric specialization for language: the higher delta amplitude in left anterior sites, the higher levels of P1 and P2 positive symptoms; the higher gamma percentage in right anterior sites, the higher levels of N4 (i.e. Passive/apathetic social withdrawal).

Conclusions: Delta and gamma rhythms are quantitative indices of the amount of neurons engaged in specific cognitive processes and they represent complementary physiological indices of neural inhibition/activation able to measure both the hypofrontality and the functional deficit of language lateralization in schizophrenia patients.

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