

AUTONOMIC FUNCTION ASSESSMENT IN PARKINSON'S PATIENTS WITH YOGA PRACTICING USING KERNEL METHOD AND ENTRAINMENT TECHNIQUES

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The experimental procedure of lowering and raising a leg Figure 1, while the subject in supine position is considered to stimulate and entrain the autonomic nervous system of fifteen patients with Parkinson's disease practicing Yoga and fifteen age and sex matched control Parkinson's disease non Yoga practicing patients. The assessment of autonomic function for each group is achieved using an algorithm based on Volterra kernel estimation. By applying this algorithm and considering the process of lowering and raising a leg as stimulus input and the Heart Rate Variability signal (HRV) as output for system identification, a mathematical model is expressed as integral equations. The integral equations are considered and fixed for Parkinson's Patients without Yoga practicing and Parkinson's Yoga practicing patients so that the identification method reduced to the determination of the values within the integral called kernels, resulting in an integral equations whose input-output behavior is nearly identical to that of the system in both Control Parkinson's without yoga practicing patients and Parkinson's Yoga practicing patients. The model for each group contains the linear part (first order kernel) and quadratic part (second order kernel). A difference equation model was employed to represent the system for both control Parkinson's patients without Yoga practicing and Parkinson's Yoga practicing patients. The results show significant difference in first order kernel (impulse response) and second order kernel (mesh diagram) for each group. Using first order kernel and second order kernel, it is possible to assess autonomic function qualitatively and quantitatively in both groups.

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