

**22<sup>nd</sup> International Conference on  
Neurology and Neurophysiology**

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**23<sup>rd</sup> International Conference on  
Neurology and Neurosurgery**

April 23-24, 2018 Rome, Italy

**Assessment of autonomic dysfunctions in patients with Parkinson's disease by cerebrovascular regulation to CO<sub>2</sub> reactivity**Shyan-Lung Lin<sup>1</sup> and Shouu-Jeng Yeh<sup>2</sup><sup>1</sup>Feng Chia University, China<sup>2</sup>Cheng Ching General Hospital, China

The relationship between changes in cerebral blood flow and arterial carbon dioxide tension can be applied to assess cerebrovascular function with steady-state and transient hypercapnia, however, both responses were found to be similar. The purpose of this study is to evaluate the cerebrovascular response to carbon dioxide (CO<sub>2</sub>) in patients with Parkinson's disease (PD) and explored the interaction between cerebral auto-regulation and ventilatory control by using nonlinear regression models. 18 PD patients underwent hyperventilation to stimulate cerebral auto-regulation based on CO<sub>2</sub> reactivity during the experiment. The cerebral vasomotor reactivity (CVMR) measurements were compared by performing nonlinear regression of the cerebral blood flow velocity (CBFV) versus the end-tidal partial pressure of carbon dioxide (PETCO<sub>2</sub>). The cerebrovascular conductance index (CVCi) was also derived to minimize the effects of arterial blood pressure on CVMR estimation and to quantify the relationship between CVCi and PETCO<sub>2</sub>. Statistical analysis of significance values between PD patients and healthy groups was evaluated. The results showed that the PD patients demonstrated a significantly lower level of CBFVmax (%) (39.24±30.17%) than did the healthy elders (78.59±28.68%) with Claassens et al.'s model. With Battisti-Charbonney et al.'s model, significance was found in CBFVmax (%) (56.39±20.42%) of PD patients in comparison with healthy elders (97.95±29.41%), and in both CBFVmax(%) and PETCO<sub>2</sub> (1.19±1.24 mmHg) range in comparison with healthy youths (86.39±29.80%; 2.89±2.14 mmHg).

**Biography**

Shyan-Lung Lin has completed his PhD from Northwestern University, USA. He joined Feng Chia University in 1992 and is currently a joint Professor in Department of Automatic Control Engineering and in the International School of Technology and Management. He has published more than 200 papers in reputed journals and international conferences, and has participated in over 40 grant-projects from National Science Council and Minister of Science and Technology, Taiwan, during the past 25 years.

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