【校級神經醫學研究中心 109 年 12 月份月會】

會議紀錄

時　　間：109年12月23日(星期三) 12:10-13:30

地　　點：現場會議-醫綜後棟15樓第二會議室

同步視訊會議-Google Meet

主　　席：蔣永孝 主任 (藍亭副主任代理)

主 持 人：林立峯 副教授

TMU Neuroscience Research Center Monthly Meeting Record for December, 2020

Chair: Vice Director Tim Lane

Recorded by: Professor J. Y. Wang, Secretary C. N. Huang

Host: Dr. Li-Fong Lin

Time: 2020/12/23 (Wednesday) 12:10-13:30

Place: 2nd Conference room at 15th Floor, United Medical Building (Back Building), Taipei Medical University (and net meeting via Google Meet held simultaneously).

Meeting Agenda (議程) :

1. Opening by Vice Director Tim Lane
2. Forum hosted by Dr. Li-Fong Lin

1. Opening

Prof. Tim Lane first announced that we will have a formal assembly concerning the future directions of the center in 2021. We hope that you will be able to contribute. The President, Vice President, and Dean of office of R&D will attend the meeting (Associate Dean of office of R&D, Vice Superintendent and Director of Research department from 3 TMU hospitals will be invited). Then Prof. Tim introduced the host, Dr. Li-Fong Lin. Dr. Lin is an Associate Professor in the School of Gerontology Health Management at Taipei Medical University and he also is a physical therapist at the Department of Physical Medicine and Rehabilitation in Shuang Ho Hospital. Today he will introduce his study about the balance function in neurological patients. As with the previous meeting, we also hold this meeting simultaneously with the in-person and the net meeting.

藍亭副主任首先宣布本中心將於 2021 年舉行共識營，**並會邀請校長、副校長、研發長及三院的副院長及研究部主任一同參與，希望所有成員都能共同參與**，目前正在研議是否與台北神經醫學中心合辦。藍副主任接著介紹今天的主持人-林立峯老師。林老師目前為高齡健康管理學系副教授以及雙和醫院復健醫學部技術長。今天他將跟我們分享平衡神經疾病患者的平衡功能研究。本次月會除現場會議外，也同時舉辦視訊會議供不能到場的成員參加。

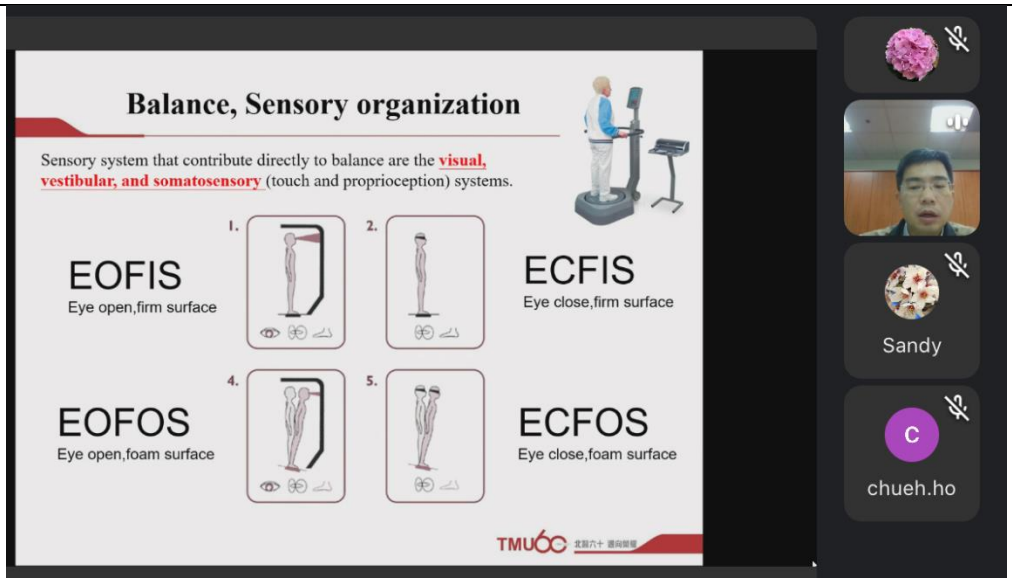
The opening by the Vice Director Tim Lane. (12/23)

2. Forum

1) Introduction

Dr. Lin introduced his work about the balance function. Postural balance involves special sensory receptors that provide information in regards to various environmental and physiological conditions that may affect a person's ability to maintain equilibrium. The sensory organization of balance concluded 3 critical parts, vision, vestibular and somatosensory systems. Vision is a critical part of our balance system. The vestibular system is responsible for processing information about movement with respect to gravity-specifically, rotation, acceleration/deceleration, and head stabilization during gait. The vestibular system works in conjunction with the visual system to stabilize the eyes and maintain posture during walking (vestibule-ocular reflex). The somatosensory system consists of touch and proprioception. Input from these two sensory sources provides critical feedback to the CNS regarding positioning in space, body sway, and changes in terrain. The sensory input from touch and proprioception allows the muscles to make constant, automatic adjustments to maintain balance and avoid falls.

In 2015, we examined the disparities in balance functions and sensory integration in patients with mild traumatic brain injuries (mTBIs) and healthy controls. Symptoms of dizziness, unsteadiness, or imbalance have been most frequently attributed to sensory organization problems involving the use of visual, proprioceptive, and/or vestibular information for postural control. In our team study. The mean physical, emotional, functional and total DHI scores measured in the mTBI group were substantially greater than those of the control group ($p<0.000$). We demonstrated that the postural stability test (anterior-posterior index) and the sensory integration test (eyes-open-firm-surface index) were substantially lower in patients with mild TBI than in the controls. Activities of daily living, balance in postural stability and sensory integration were strongly impaired in patients with mild TBI.



The forum hosted by Dr. Li-Fong Lin. (12/23)

In 2017, we also compared subjective and objective measurements of symptoms of dizziness and postural stability in patients with mild traumatic brain injury (mTBI) during the first week following the injury. The Dizziness Handicap Inventory (DHI) and modified Clinical Test of Sensory Integration and Balance were used as the subjective and objective measures of dizziness and ability to perform daily activities, respectively. In our group study demonstrated that the physical, emotional, functional, and total aspects of the DHI significantly differed between the three mTBI subgroups (low, middle, high) and the control group. In our group study, we demonstrated that the physical, emotional, functional, and total aspects of the DHI significantly differed between the three mTBI subgroups (low, middle, high) and the control group. The sensory integration indices (ECFIS and ECFOS) significantly differed between the three mTBI subgroups and the control group. ECFIS index could predict mTBI with functional, emotional, and total aspects of the DHI related to the patients' complaints of ECFIS index could predict mTBI with functional, emotional, and total aspects of the DHI related to the patient's complaints of dizziness.

In 2019, we tried to evaluate the feasibility and effectiveness of intermittent theta burst stimulation in the stroke patients aiming to stimulate bilateral leg motor cortex and pro-mote functional improvements. Participants were randomized into two groups to receive 10 sessions of iTBS group and sham group over a 5-week period. The iTBS was delivered over the midline of the skull to stimulate the bilateral leg motor cortex. The outcome measures included balance, mobility, and leg motor functions were measured before and after interventions. Within-group differences were significant in the Berg Balance Scale for both groups (Z=-2.442, P=0.015 in iTBS group; Z=-2.094, P=0.036 in the sham group), in the Fugl-Meyer Assessment (Z=-2.264, P=0.024). However, no significant between-group differences were found. Within-group differences were significant in the Overall Stability Index of the Biodex Balance System of iTBS group (Z=-2.124, P=0.034). However, no significant between-group differences were found. (Z=-2.124, P=0.034). However, no significant between-group differences were found.

In our latest publication, we investigated the differences in balance and gait among older adults with preserved cognition, amnestic mild cognitive impairment, and mild dementia due to Alzheimer's disease. Participants were classified into three groups, healthy controls, mild cognitive impairment, and mild dementia. The balance was evaluated through the functional test (Berg Balance Scale [BBS]) and laboratory test (posturography). Gait was assessed by the wearable device. Muscle strength and mass were measured through grip force, calf circumstance, and body composition. The scores of balance function, measured by BBS, were significantly higher in the control group than in the two cognitive impairment

The forum hosted by Dr. Li-Fong Lin. (12/23)

groups. The scores for all postural stability (OA, AP, and ML), Fall Risk (FR) Index and the two sensory integration indices (EOFIS, EOFOS) were lower in the control group than in the two cognitive impairment groups. The FR Index (P=0.01) and sensory integration indices (EOFIS and EOFOS) significantly differed between the two cognitive impairment groups and the control group. The gait speed and stride length were significantly higher in the control group than the MCI group, and also in the control group than the mild dementia group.

According to our 4 studies, the conclusion is that the balance was considerably impaired in mTBI and dementia patients, and there was no evidence showing that the iTBS treatment can promote the motor-function in the stroke patients.

2) Discussion

Prof. Thierry asked the difference between the iTBS and rTMS. Dr. Lin answered that the iTBS protocol is different from the traditional rTMS protocol. It takes less time and causes less side effects.

Prof. Hu asked what is the mechanism of the gait balance in dementia patients because the gait and the balance are involved in so many parts of the brain, but Prof. Lin said they still working on that. Prof. Tim, Dr. Chuang, and Dr. Kao also discuss the study with Dr. Lin about the specific brain area, like the cortex, and the correlation between eye movement and motion.

白台瑞副院長詢問 iTBS 跟 rTMS 有甚麼差別，林老師回答 iTBS 將較於傳統的 rTMS 在操作時間上較短，且副作用也比較少。胡朝榮副院長想知道因為步態平衡在腦內牽涉到許多區域，在癡呆的患者中，對於步態平衡的機制是否有進一步的研究，但林老師表示目前還尚未有明確的結果。藍亭教授、莊健盈老師及高祖仁老師也針對眼睛的移動與動作的關聯性及林老師目前研究在腦部區域進行討論。

Members discussed in the forum meeting. (12/23)

臨時動議：

校方目前推動實踐大學社會責任，其目的為加強大學與社會連結、培養創新人才及盡善社會責任並發展學校特色,同時希望能進一步達到聯合國永續發展目標(Sustainable Development Goals，SDGs）第三點「良好的健康和福祉 - 確保健康的生活，促進所有年齡層人民的幸福」，因此研發處來信希望能將中心過去到現在之研究成果鏈結 SDGs 3 並進行定期討論。請各位成員若目前正在進行的研究有與社區連結或是以實際應用成果為目標(如：新藥研發、新型輔具開發、社區活動、教育等)，請再跟秘書聯絡，我們會再定期追蹤。

會議結束時間為 13:00。