A new facility for functional-based approach to vestibular hypofunction

Po-Cheng Hsu[a], Chen-Liang Chou[a,b,*]

[a]Department of Physical Medicine and Rehabilitation, Taipei Veterans General Hospital, Taipei, Taiwan, ROC; [b]School of Medicine, National Yang-Ming University, Taipei, Taiwan, ROC

TO THE EDITOR

We read with great interest the article written by Dr. Wei and Dr. Kao, entitled "Establishment of vestibular function multimodality platform",[1] which has been published in the *Journal of the Chinese Medical Association*. We want to congratulate the authors for this successful invention and for their contributions in the evaluation of vestibular functions.

Functional evaluation has an important aspect in physical medicine and rehabilitation. Since physical performances and activities of daily livings (ADLs) are dynamic motions, a clinic-based static physical examination is unable to simulate the real world conditions. Emerging designs based on inertial measurement units (IMUs) had been applied in functional evaluation and treatment, such as gait analysis[2] and fall prevention in Parkinson's disease.[3] The ability to allow for quantitative measurement makes IMUs a useful tool in dynamic functional evaluation, which is an extraordinary important in ADLs compared with the static physical examination.

Vestibular hypofunction may be an underestimated chronic condition[4] with considerable negative impacts on physical performances and health-related quality of life.[5] As the prevalence of vestibular hypofunction increases with age, the subsequent higher fall risks can lead to economic burden of health care system especially in an ageing society. An innovation of IMUs-based platform to evaluate vestibular ocular reflex and gaze shifting can potentially be applied efficiently to the rehabilitation prescription of vestibular hypofunction. Further benefits of its integration with other therapeutic strategies could be expected.

REFERENCES

1. Jheng YC, Yu CH, Chen PY, Cheng YY, Lin TC, Huang SE, et al. Establishment of vestibular function multimodality platform. *J Chin Med Assoc* 2019;**82**:328–34.
2. Taborri J, Palermo E, Rossi S, Cappa P. Gait partitioning methods: a systematic review. *Sensors (Basel)* 2016;**16**.pii:E66
3. Caramia C, Torricelli D, Schmid M, Munoz-Gonzalez A, Gonzalez-Vargas J, Grandas F, et al. IMU-based classification of parkinson's disease from gait: a sensitivity analysis on sensor location and feature selection. *IEEE J Biomed Health Inform* 2018;**22**:1765–74.
4. Ward BK, Agrawal Y, Hoffman HJ, Carey JP, Della Santina CC. Prevalence and impact of bilateral vestibular hypofunction: results from the 2008 US national health interview survey. *JAMA Otolaryngol Head Neck Surg* 2013;**139**:803–10.
5. Grill E, Heuberger M, Strobl R, Saglam M, Holle R, Linkohr B, et al. Prevalence, determinants, and consequences of vestibular hypofunction. Results from the KORA-FF4 survey. *Front Neurol* 2018;**9**:1076.

*Address correspondence: Dr. Chen-Liang Chou, Department of Physical Medicine and Rehabilitation, Taipei Veterans General Hospital, 201, Section 2, Shi-Pai Road, Taipei 112, Taiwan, ROC. E-mail addresses: cl_chou@vghtpe.gov.tw (C.-L. Chou).

Conflicts of interest: The authors declare that there are no conflicts of interest related to the subject matter or materials discussed in this article.

Journal of Chinese Medical Association. (2019) 82: 881.

Received July 16, 2019; accepted July 16, 2019.

doi: 10.1097/JCMA.0000000000000164.