



**7th World Congress on
Physical Medicine and
Rehabilitation**

May 18-19, 2018 Osaka, Japan

**Scientific Tracks & Abstracts
(Day 1)**

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PHYSICAL MEDICINE AND REHABILITATION

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GNE myopathy: Recognizing key features to optimize physical therapy treatment in a rare myopathy**Jenna DeSimone and Stephen Fischer**
RUSK Rehabilitation, USA

Background & Purpose: GNE myopathy, a rare autosomal recessive adult-onset disorder with progressive muscle atrophy and weakness, is due to a missing GNE/MNK enzyme, causing a sialic acid deficiency. Progressive distal limb weakness with unique quadriceps sparing presentation is common. Investigational drug trials exist, but the disease currently has no cure. GNE myopathy has often been misdiagnosed, due to large exclusions in the population when histopathologic diagnostic criteria required multiple findings on muscle biopsy. Today the diagnosis relies on clinical presentation, including muscle imaging and is confirmed by genetic studies. GNE myopathy presents with unique patterns of muscle dominance-quadriceps vs. hamstrings, abductors vs. adductors, hip extensors vs. hip flexors, plantar flexors vs. dorsiflexors, biceps vs. triceps-with subjective reports of tripping, difficulty managing steps and rising from chairs. The authors have partook in data collection for a GNE myopathy IRB approved drug trial for 4-years and are now seeing this population in the clinic. There is no literature available on GNE myopathy and physical therapy at this time. This report will identify the clinical characteristics of GNE myopathy and highlight the role of physical therapy (PT) in improving physical function, decreasing falls risk and improving quality of life in this patient (pt) population.

Case Description: Patient is a 42-year old-female, noted a 6 year progressive decline in distal BLE weakness with increased falls. She was referred to PT for strengthening, balance and gait training and also transition from soft over the counter AFOs to custom AFOs. She was not enrolled in a drug trial. Pt presented on evaluation with impaired strength, balance, endurance and increased fear of falls. Pt received 30-60 min individual PT sessions 1-2 times per week for 32 sessions.

Result: At onset of care, pt was evaluated per standard outcome measures to assess for baseline function and falls risk. Her plan of care was established with goals of strengthening dominant muscle groups to optimize function, balance training to decreased falls risk and improve confidence with mobility and progressing high level mobility, with recommendations to appropriate AFOs. Pt demonstrated the below improvements in standard outcome measures from her start to end of care: 5 Time Sit to Stand: 9 seconds to 6 seconds, Timed Up and Go: 7.8 seconds to 6.6 seconds, Gait Speed (GS) self-selected: 1.21 m/s to 1.49 m/s, GS fast: 1.56 m/s to 1.79 m/s, Mini-BESTest: 20/28 to 27/28 and Hi-MAT assessment: 27/54 to 29/54. Pt improved her fall rate from in 3 months.

Conclusion & Discussion: Knowledge of GNE myopathy presentation and prognosis enabled PT to develop targeted strengthening programs to improve functional strength, decrease risk of falls, and improve quality of life. Focused strengthening of dominant muscles in moderate intensity to prevent fatigue is essential in a population with difficulty generating new muscle fibers. Education on appropriate bracing to decrease falls risk and improve high level mobility added to pt quality of life. More research is warranted as treatment options for pts with GNE myopathy progress.

Biography

Jenna DeSimone is a Specialist in Neurological Recovery and is a board certified Neurological Clinical Specialist, and a Senior Staff Physical Therapist at NYU Langone Health. She is a graduate of Villanova University (BS) and received her Doctorate in Physical Therapy from Sacred Heart University in 2012 and joined NYU Langone Health the same year. After spending three years rotating through inpatient care, acute rehab, and outpatient care, she began her specialization in community-based rehab in the neurological spectrum of care. She has since risen to the senior level as a non-rotating member of the Neurological Outpatient Department and is a certified clinical instructor, serving as a Lead Instructor for physical therapy students. Her prior involvement in research includes work with Ultragenyx Pharmaceuticals on Phase II-IV research programs for GNE myopathy and participation in IRB approved research on brain injury, aphasia and physical therapy.

Jenna.DeSimone@nyumc.org

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Role of phosphodiesterase (PDE) inhibitors and TNF alpha blocking agent with goal based physical therapy in functional recovery of stroke patient: a case studySoniya Shah¹, Deepak Goel¹¹Max Healthcare, India

Objective: To investigate the neuronal recovery pattern of a massive MCA infarct after administration of neuroprotective-NP agents along with goal based physical therapy.

Method: We tried to modify the outcome with help of combination of NP agents for which we have given cerebroprotein inj., Edaravone inj. for 7 days, PDE 1 inhibitors (Vinpocetine) for 1 month, Eterncept inj. (TNF alpha blocking agent) within 7 days of stroke along with intensive physical therapy as per stroke protocol from day 2.

Scales used for measuring clinical improvement: MMSE, MRC Grading, Barthel index-BI, Motor Assessment Scale (MAS) and Modified Rankin Scale (MRS) on day 0, day of discharge, at 4 and 8 weeks post stroke for examine cognitive status, limbs voluntary strength, basic ADLs and overall degree of disability respectively.

Result: We took a case of post massive MCA infarction (right) which was not suitable for thrombolysis at that time because the patient was out of window period when we received in emergency unit of our hospital. After selection of drugs by our neurologist and physical exercises as per stroke protocol by PT, analysis yielded significant differences in these outcome measures within first 15 days of therapies in hospital stay; then progresses was continued in term of limbs voluntary movements (lower limb>upper limb), basic ADLs, gait pattern and overall improvement in degree of disability or dependence within first 2 months of therapies which we had selected for observation in our research. However, arm function (gross and fine motor movement), accuracy in gait cycle were still not much modulated, it could be selection of short term follow up period (initial 8 weeks). Here, we had mentioned significant improvement in numerical form on various scales such as MRC, MRS, BI, MAS, have been listed in table1, table2 and table3.

Conclusion: Combination of neuroprotective agents with goal based intensive physical therapy can lead to significant improvement in massive infarction. Further, large scale, and multicenter studies along with long term follow up are required to validate the current hypothesis.

Biography

Soniya Shah, completed master in physiotherapy MPT (Neurology) from Garhwal Central University, Srinagar India on 2012. She is working with max healthcare India in max super specialty hospital Dehradun unit under max institute of neurosciences Dehradun (MIND) team. As a consultant Neuro-physical therapist and coordinator of neuro physiotherapy services for out and in-patient care deals with the various brain and spine related disorders. She do examination of client physical ability using functional ability testing, impairment scales, other tests and procedures, observe and review physician/surgeon referrals and patient medical records to formulate an accurate diagnosis and best course of treatment. Also, manage all documenting related progress notes, discharge summaries, home therapy plan of in-patients and do volunteer duties on in-house seminars and conferences. Routinely, provides comprehensive training/ academic sessions in PT techniques to nursing and other medical personnel as well as family members of patients. Lastly, keep current on literature and research in the field, provides up to date best practice information.

soniasahgangola@gmail.com
sonianeuropt28@yahoo.in**Notes:**

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Effect of a self-developed balance training program in preschool children with developmental coordination disorder**Rong Ju Cherng¹, Pei Yi Lin¹, Ya Ju Ju¹ and Yi Chun Du²**¹National Cheng Kung University, Taiwan²Southern Tainan University of Science and Technology, Taiwan

Children with developmental coordination disorder (DCD) perform poorly in motor skills, postural control and acquisition of balance-related skills. Therefore, they tend to withdraw from participating physical activities. Such situation may end in a vicious cycle of low motor activity and physical unfitness. It is important to find a solution to encourage these children to engage more in physical activities. Wii Fit is a popular game for children. However, the scores of Wii Fit games are not related to the balance ability. To solve the problems on balance training with Wii Fit games, we have developed a balance training system (iBalance) with games-oriented software combined with Wii balance board for training and assessment. 20 preschool children with DCD and 16 typically developing preschoolers (TD) participated in the study. The intervention program was provided 45 min per session, 2 sessions per week and for 4 weeks. The assessment was performed at three-time spots: pre-, post-treatment and 4 weeks follow-up. The results showed positive effects of training after the treatment and the effect lasted 4 weeks. The iBalance is proved to be a potential tool for balance training for children with DCD.

Biography

Rong-Ju Cherng is a Professor of Physical Therapy in the Department of National Cheng Kung University, Taiwan. She is also acting as the Chairperson of the Institute of Allied Health Sciences of the same university. She has received her BS degree in Physical Therapy, Physical Medicine and Rehabilitation, National Taiwan University followed by MA in Physical Therapy, New York University, NY and PhD in Biomedical Engineering, National Cheng Kung University, Taiwan. She has been teaching both in National Cheng Kung University and the affiliated hospital since 1992. Her area of expertise is pediatric physical therapy. Her research has been focused on the balance control in children with cerebral palsy and children with developmental coordination disorder.

rjc47@mail.ncku.edu.tw

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Young Researchers Forum

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Anatomically based oropharyngeal rehabilitation for patients with obstructive sleep apnea- A Systemic Review and Meta-analysisHsin Yu Lin¹, Cheng Yu Lin², Ching Hsia Hung¹¹Institute of Allied Health Sciences, Medical College, National Cheng Kung University²Department of Otolaryngology, National Cheng Kung University Hospital

Background: Pathophysiology of obstructive sleep apnea (OSA) is critically based on the determinant, upper airway anatomic impairment, predisposed by oropharyngeal muscle dysfunction or respiratory drive instability or both. However, oropharyngeal muscle dysfunction is the most frequent predisposing factor among them and also the very key point in this study. One of the most important function of oropharyngeal muscle is to dilate and stiffen the upper airway patency throughout respiratory cycle. Therefore, oropharyngeal rehabilitation becomes a novel non-invasive management for OSA.

Objectives: Since a comprehensive oropharyngeal rehabilitation program should involve with multiple levels based on upper airway anatomy, therefore, (1) a systemic review was explored to summarize WHAT a comprehensive oropharyngeal rehabilitation program might be. (2) a meta-analysis was conducted to examine HOW the effect of oropharyngeal rehabilitation might be, and to delineate the indications for WHO might benefit from oropharyngeal rehabilitation.

Methods: A search was performed on MED-LINE, EMBASE, and The Cochrane Library. The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) procedure were followed as guidelines.

Statistics: Main outcomes from polysomnography (PSG) including the Apnea Hypopnea Index (AHI), lowest oxygen saturation (LSAT) and Epworth Sleep Scale (ESS) are analyzed by Comprehensive Meta-Analysis version 2.0 to demonstrate the effects of oropharyngeal rehabilitation.

Results: 7 studies with 201 participants were included in our meta-analysis and the pooled data demonstrated that the effects of oropharyngeal rehabilitation between pre- and post- intervention were significantly changes in mean difference reduced 9.605 events/ hour on AHI (95 % CI -11.099 to -8.112; $p < 0.0001$); declined 3.336 % on LSAT (95 % CI -4.549 to -2.124; $p < 0.0001$); lowered 1.301 on ESS (95 % CI -1.949 to -0.653; $p < 0.0001$); decreased 0.574 cm on NC between (95 % CI -1.058 to -0.089; $p = .002$); no significant change on BMI.

Conclusions: Oropharyngeal rehabilitation can have more significant effects in improvement of both objective AHI, oxygen saturation and neck circumference and as well objective Epworth Sleep Scale for mild and moderate subjects than severe ones; however, it also proved no significant effect on BMI.

Conclusions: Our systemic review implies that oropharyngeal rehabilitation with multilevel approach on anatomical basis can supply the practical strategy for clinical application. However, local oropharyngeal rehabilitation cannot satisfy other the clinical phenotypes associated with different pathophysiology, a comprehensive OSA rehabilitation should involve more scenarios aiming at the systemic effect of respiratory control circuit.

Keywords: obstructive sleep apnea, oropharyngeal rehabilitation, AHI, ESS, meta-analysis

Biography

Hsin Yu Lin is a Doctoral student in the Institute of Allied Health Science in National Cheng Kung University in Taiwan. She is an experienced Physical Therapist with Orthopedic specialty, particularly with post-operative rehabilitation and assistive technology. Her research interest is in sleep medicine which is a multidisciplinary specialty as the traumatic center which is also integrated by different clinician team members.

lhy7581@gmail.com.tw

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Contributing factors to playing-related musculoskeletal disorders in female flute players**TaeYeong Kim^a, PT, MSc, Hey Won Jung^b, MM, Jin Yana, MD of TCM, Jeeyoung Yoon^c, MM, BumChul Yoon^{a,d}, PT, OT, PhD**^a Major in Rehabilitation Science, College of Health Science, Korea University Graduate School^b Dongduk Women's University^c Sejong Campus, Korea University^d Department of Physical Therapy, College of Health Science, Korea University

Background: Flutists maintain asymmetrical and rotated postures of the neck-trunk-pelvis while playing the flute. The asymmetrical playing posture potentially causes functional disabilities and increased muscle strain. The characteristics of flutists' playing posture may lead to a high prevalence of playing-related musculoskeletal disorders (PRMDs) in female flutists.

Objective: To identify physical and psychological risk factors of PRMDs in female flutists, we examined pain intensity, functional disabilities in the upper extremities, and psychological factors through a self-administered questionnaire.

Methods: Professional flutists with >5 years of experience were sampled to participate in this study. Participants were divided into three groups depending on professional tenure (5–10, 11–20, and 21–30 years). Self-administered questionnaires were used to assess pain intensity, functional disabilities, and fear-avoidance belief (FABQ) scores. The relationships between factors were analyzed using one-way analysis of variance. The significance level for all tests was set at 0.05.

Results: Twenty-one female flutists (mean age: 31.57 years; mean experience duration: 15 years) were included in the study. A significant interaction was observed between career durations and the FABQ scores ($p = 0.030$). Upon Bonferroni post hoc analysis, flutists with professional experience >21 years were found to have greater FABQ scores than those with 5–10 years ($p = 0.031$) of experience. No other significant interactions were observed.

Conclusions: PRMDs in female flutists can be prevented and managed not only through exercise interventions for physical improvement but also through professional education and psychological support. Thus, professional flutists, physical therapists, and psychologists should collaborate in an effort to develop professional educational programs for flutists.

Biography

TaeYeong Kim, PT, MSc is a Researcher in Applied Neuro-Dynamics Laboratory She is Major in Rehabilitation Science, Currently pursuing PhD course at Korea University Graduate School, Seoul, Republic of Korea.

agatha902@korea.ac.kr

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Comparison of the fatigue effect on lower extremity movements in subjects with or without chronic ankle instability during a lateral hopping task.**Ting Chun Huang***Chiung Yu Cho National Cheng Kung University, Taiwan.*

Research Objectives: Ankle sprain is one of most common sport injury. Fatigue was regarded as the risk factor which may increase the incidence of ankle sprain. Lots of researchers have investigated the pathological changes on the ankle sprain side; however, few studies have discussed the compensating mechanism on the sound side. Therefore, the purpose of this study was to compare the movement patterns in both lower extremities between the athletes with chronic lateral ankle sprain and the healthy participants during a lateral hopping task before and after fatigue.

Methodology: Twenty-six athletes were recruited from school or stadium. Half were subjects with chronic ankle sprain. After the warm-up exercise, the subjects may practice the lateral hopping task couple times until they were familiar with it. After performing the lateral hopping task, a fatigue task was performed. After the fatigue task, subjects performed the same task as before. The motion of the lower extremities was captured by the Qualisys System during the lateral hop task, and the data were analyzed for 200ms pre- and post-initial contact. Independent t test was used to analyze the baseline data (e.g. height, body weight) between control group and chronic ankle instability group. Three-way ANOVA was used to analyze the dependent variable, all results were analyzed by SPSS version 17.0 (SPSS, Inc., Chicago, IL, USA). The significant level was set at $p < 0.05$.

Result: Currently, we analyzed 16 subjects. For the ankle sagittal plane motion at initial contact, there was no interaction effect on time, group, and side factors. For the ankle frontal plane motion, there was a main effect on side ($p = .028$), and a significant interaction for group X time X side in ankle instability group ($p = 0.04$). Post hoc analysis was processed. The ankle sprain group had a more-inverted ankle on the injury side than the sound side ($+5.99^\circ$) at initial contact before fatigue task ($p = .093$). In normal group, they had a more-inverted ankle on their dominant side than their non-dominant side ($+8.24^\circ$) after fatigue task, and the result stated significant difference ($p = .021$). Conclusion: Although there was no significant difference between groups in two sides of ankle motion at initial contact for both before and after fatigue task, some differences were found subsequently. The ankle sprain group had a more-inverted ankle on the injury side than the sound side ($+5.99^\circ$) at initial contact before fatigue task. In the normal group, they had a more-inverted ankle on their dominant side than their non-dominant side at initial contact after fatigue task, and these differences may be related to increased risk of ankle injury.

Biography

Ting Chun Huang is a senior of master's degree student in Postural and Balance Lab in the Department of Physical Therapy in National Cheng Kung University in Taiwan. He is a physical therapist and usually participates in sports events for providing athletes physical therapy treatment in international competitions, such as WBSC IV U-12 Baseball World Cup® 2017. His advisor is Dr. Chiung-Yu Cho, who is the associate professor in the Department of Physical Therapy and specializes in "Motor Control and Cumulative Trauma Disorder". Professor Cho has published more than 70 papers in reputed journals and has been serving as an editorial board member of repute.

miova0108@hotmail.com

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