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Abstract of 11th International Meeting of Asian Rehabilitation Science
Joint meeting with the 32nd International Meeting of Physical Therapy Science



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11th International Meeting of Asian Rehabilitation Science
Joint meeting with the 32nd International Meeting of Physical Therapy Science
March 6th, 2021

Chair: Dr. Hitoshi Maruyama (Japan)

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Thanda Aye

Current Status of Myanmar Physiotherapy Association

Tin Hlaing Soe, RPT, MS.

President of Myanmar Physiotherapy Association

Republic of the Union of Myanmar

Myanmar Physiotherapy Association (MPA) was founded with a few Physiotherapists in 2004. The MPA has been officially recognized as a registered association by the Ministry of Home Affairs since 2013. The MPA became a provisional member of World Physiotherapy in 2016. It has been a full member of World Physiotherapy since 2019. Total members of the MPA as of December 2020 are 840. There are 4-year term 15 executive committee members who are elected by the member Physiotherapists at the general meeting. Several subcommittees are organized under the MPA. The MPA annually celebrates World Physiotherapy Day on the 8th of September every year. The celebration always includes general meetings and academic sessions. The Continuous Professional Development (CPD) programs are also organized at least three times a year. The public activities of the MPA are visits to homes for the aged, nursing homes, and religious care centers to give necessary Physiotherapy management. Community-based Physiotherapy programs, working together with the Rehabilitation Society of Myanmar Medical Association, are also provided in some villages and townships in different areas of Myanmar. The MPA also organizes social activities every two years. The MPA collaborates with the University of Medical Technology, Yangon for upgrading the entry-level Physiotherapy curriculum and participating as external examiners at the bedside clinical examination of the postgraduate master's program. Many seminars, conferences, and webinars can be jointly held with international associations such as the Society of Physical Therapy Science in Japan, the Singapore Physiotherapy Association, the Asian Western Pacific Region of World Physiotherapy, and the International Committee of the Red Cross. The MPA could publish a magazine two times. The MPA is now collaborating with the Myanmar Covid-19 containment, prevention, and treatment committee and sending Physiotherapists as volunteers to many different Covid-19 treatment centers in Yangon and Mandalay cities. The future plans of the MPA include the establishment of the Myanmar Physiotherapy council and council law, receiving professional autonomy and license, and developing a research culture.

The future of smart healthcare; rehabilitation using virtual reality

Byoungkwon Lee, RPT, Ph.D.

Department of Physical Therapy, Konyang University, Korea

The 4th Industrial revolution refers to industrial change that brings innovative changes to the economy and society through the fusion of artificial intelligence technology, IoT, and information and communication technology(ICT). The 4th Industrial Revolution is characterized by hyper-connectivity in which various products and services are connected through networks and hyper-intelligence in which things become intelligent. Representative technologies are artificial intelligence technology, information and communication technology, 3D printing, unmanned transportation, robotics, nanotechnology, virtual reality (VR), and so on. Advances in these technologies are having a great influence on the changes in the healthcare field. In particular, the development of VR-based therapy (VRT) technology is an area of interest in the medical field. Along with robotic rehabilitation, VRT is drawing attention in the field of rehabilitation. And in more recently, it has been using in various ways for evaluation and intervention in the field of rehabilitation. VR systems reduce the risks that may arise in real situations and give patients the opportunity to safely experience situations that cannot be experienced in real situations. VR technology can also be used to eliminate distractions and provide an environment that attracts the attention of the subject and increases concentration. In addition, the VR system provides a tapping mechanism for intrinsic(autonomous) and external (compensation) motivation, and enriches imagination, so it can keep the patient's attention longer than traditional treatments. For the reasons of these effects, some researches show that the VR system can improve the ability to observe the surrounding environment and the ability to control posture in standing and sitting. Also there are many researches that it is effective in improving balance, muscle strength, range of motion, and coordination ability. On the other hand, despite the need for continuous treatment for the rehabilitation, some patients give up rehabilitation because it is difficult to go to the hospital continually. Therefore, it can be determined that the provision of physical therapy programs through the VR system will be helpful for rehabilitation because it can be used anytime, anywhere. In addition, the VR system has the effect of minimizing the help of the therapist and increasing the internal motivation to perform active and periodic physical therapy on the patient himself. Furthermore, previous studies pointed out that more complex functional training is possible because the training situation can be precisely controlled through the VR system. And, according to some studies, VR training activates networks of the frontal cortex, parietal cortex and other motor cortex, as if practicing in real life, leading to reconstruction of neurons in the cerebral cortex, increasing balance, spatial orientation and motor function.

In particular, due to the recent COVID-19 pandemic, the importance of non-face-to-face medical services has been very emphasized. So, in line with the advantages of VR system and the modern situation, it is believed that more research on physical therapy using virtual reality(VR) that can be conducted non-face-to-face in the future should be carried out.

Relationship between psychological status and income, education, learning and other factors of physiotherapists in Beijing Hospital during the COVID-19 Pandemic

Qiuchen Huang, PT, PhD

China Rehabilitation Research Center, China

[Background and Purpose]

In 2020, the COVID-19 Pandemic occurred in China. The mode of life work, study and other aspects has been affected. Even in the hospital, the working environment, medical contents and working mode of medical workers have also undergone great changes. For example, physical therapists who face hemiplegia and paraplegia fractures have undergone various changes in their work environment, income, interpersonal relationships, and education. At present, some literatures have begun to study the changes in the mental state of medical workers caused by the COVID-19 Pandemic, but there are still few studies on the mental state of physical therapists that target the epidemic. Therefore, the purpose of this study is to explore the relationship between the psychological stress state of physical therapists and factors such as income, study, and exercise during the COVID-19 Pandemic.

[Methods]

The subjects of this experiment are 20 rehabilitation therapists (Male 11 and Females9). All of them work in the same rehabilitation department of the general hospital in Beijing. The evaluation scale is the psychological stress VAS, the psychological stress assessment scale of Chinese rehabilitation therapists. The average hours of exercise and study weekly was investigated during the COVID-19 Pandemic. The income and the number of patients were recorded of all subjects and the Rehabilitation Department in 2019 and 2020. The number of new cases and cumulative cases of COVID-19 patients in China and Beijing from January to December 2020 were queried through the Internet.

The statistical methods are Person correlation and Chi-square test to discuss the relationship between items.

[Results]

Physiotherapists, especially low-age physiotherapists, have greater psychological pressure. In particular, the decrease in income has a greater impact on psychological pressure. At the same time, the decrease in exercise time is also related to the pressure. The monthly income of Physiotherapists is negatively correlated with new cases of new coronary patients at the beginning of the COVID-19 Pandemic.

[Conclusion]

In this study, the Relationship of the income of therapists and the situation of the COVID-19 Pandemic were analyzed. In order to psychological pressure caused by income, it is necessary to recommend a physical therapist for proper psychological counseling. And it is recommended to increase exercise to change the mental state.

Effects of Neuromuscular Joint Facilitation on Knee Joint

Ming Huo

Department of Physical Therapy, Faculty of Medical Health, Himeji Dokkyo University

Proprioceptive neuromuscular facilitation (PNF) is a technique used to improve lower-limb muscle strength and gait function. Neuromuscular joint facilitation (NJF) is a new therapeutic exercise based on kinesiology, which is used to increase strength, flexibility, and range of motion (ROM). NJF integrates the facilitation element of PNF and the joint composition movement, with the aim to improve the movement of the joint through passive exercise, active exercise, and resistance exercise.

In clinical research, NJF intervention has an immediate effect on knee muscle force and iEMG reaction time, rotational function of knee, and it not only decreased pain severity but also improved the walking ability of elderly subjects with knee osteoarthritis.

Screw home mechanism (SHM) of knee joint is a critical mechanism that play an important role in terminal extension of the knee. There is an observable rotation of the knee during flexion and extension. This rotation is important for healthy movement of the knee. NJF techniques include proximal resistance of joints, resistance to rotational movement and traction, which can be expected to improve the function of SHM.

In this lecture, I will introduce the NJF knee joint technology and its research results. In addition, introduce the knee joint self-training method based on NJF theory.

Unique daycare for elderly people of Japan

Shinichiro Murakami

Department of Physical Therapy, Faculty of Medical Health, Himeji Dokkyo University

In Japan, there is public long-term care insurance. All people who live in Japan must pay long-term care insurance from 40 years old to 65 years old. And be a more than 65 years old, the person receiving a pension 180,000 Japanese yen or more in the year must pay long-term care insurance.

The service of the elderly person that life is inconvenient is offered from Long-term care insurance. Daycare for elderly people is one of the services of these, so provided in Long-term care insurance. This Japanese “daycare for elderly people” have to contain rehabilitation service. Only in the facilities where there is a doctor, we can perform the daycare. And there must be a physical therapist and/or an occupational therapist and/or a Speech therapist.

By this session, I introduce unique daycare of Japan. It includes not only the training but also a meal, the bathing and more.

O-1 Gross Motor Skill Development of Myanmar Children with Special Needs

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1) Department of Physiotherapy, University of Medical Technology, Yangon, Ministry of Health and Sports, Republic of the Union of Myanmar

[Background and Purpose]

Gross motor skills are fundamental movement skills that use several large muscles to perform a movement task. The existing literature has highlighted that early assessment for the development of gross motor skills during preschool and elementary school years is particularly important for Physiotherapists to properly design exercise programs. The gross motor skill development can be assessed with developmental tests and the appropriate test can be selected based on the purpose of the assessment. Children with special needs mean "the children who are suffering from any of a wide range of physical, intellectual, emotional, and behavioral problems and medical conditions". Children with special needs from different countries showed a lower level of gross motor skill development when compared to chronological age-matched typically developing children. To our knowledge, no study has investigated the gross motor skill development of Myanmar children with special needs. Thus, the purpose of this study was to find out the gross motor skill development of Myanmar children with special needs.

[Participants]

Total 139 children with special needs aged between 72 and 131 months (mean age: 115.7±17.6 months; 72.7% boys) from the School for Disabled Children, Yangon participated.

[Methods]

This cross-sectional institutional-based descriptive and comparative study used the Test of Gross Motor Development second edition (TGMD-2) as the main outcome measure. The TGMD-2 consists of 12 gross motor skills divided into locomotor and object control subtests. The assessment procedures were done according to the standardized guidelines of TGMD-2. Descriptive statistics were used to calculate demographic data and TGMD-2 scores for all participants. An independent t-test was used to compare TGMD-2 scores between boys and girls. One-way ANOVA with Scheffe Post-hoc test was used to compare TGMD-2 scores among different types of special needs. Statistical significance was set at $p < 0.05$ for all tests.

[Results]

The mean values of the locomotor raw score and object control raw score were 21.1±12.2 and 24.2±10.4 respectively. The mean locomotor standard score was 2.90±2.61, the object control standard score was 3.10±2.64, and the gross motor quotient was 58.0±13.1. The majority of the participants had a "very poor" level of gross motor skill rank (79.9%, n=111). The boys had significantly better performance on "stationary dribble" and "kick" than the girls ($p < 0.05$). There was no significant difference in gross motor skills among different types of special needs.

[Conclusion]

Although the participants were able to perform all 12 items of the TGMD-2, their performance was poor. The mean age was 115.7±17.6 months, however, the age equivalent score for the locomotor skills was (39-66 months) and the object control skills was (51-69 months). Thus, the motor ages of both the locomotor skills and object control skills were younger than the chronological ages. The findings of the current research have given the necessary information for those who are working for early childhood intervention as well as for the policymakers to consider better service provision for the children with special needs.

O-2 Effect of Structured Exercise Program on Fundamental Motor Skills in Children with Down Syndrome: Pilot study

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[Background and Purpose]

Children with Down syndrome (DS) usually have delayed motor development so physiotherapy interventions are necessary for these children. Several systematic reviews and meta-analyses had identified the effects of Fundamental Motor Skills (FMS) intervention programs on the FMS proficiency of children with and without disabilities. No study has been found that what type of structured exercise program can improve the FMS of Myanmar children with DS. Moreover, there are increasing researches in physiotherapy interventions for children with DS, the current literature is still unclear on the effects of a structured exercise program on the FMS proficiency in this population. Furthermore, there is still lacking standardized physiotherapy treatment protocol to develop the FMS in children with DS in Myanmar. Thus, the purpose of this study was to examine the effect of a structured exercise program on fundamental motor skills in 7-to-10-year-old children with DS.

[Participants]

This pilot study included five participants between the age of 9 and 10 years (2 boys: 3 girls) from the School for Disabled Children, Yangon, Department of Social Welfare, Ministry of Social Welfare, Relief and Resettlement, Myanmar.

[Methods]

In This institutional-based one group pretest-posttest study, the participants received a group exercises program including five stations lasting for 50 minutes per session, three sessions per week up to three weeks (total nine sessions). The FMS proficiency level was measured as the primary outcome with the Test of Gross Motor Development second edition (TGMD-2), static balance, and lower extremity functional strength were measured as the secondary outcomes with Modified Stork test and five-time sit to stand test respectively. All outcome measures were assessed before (baseline) and after the intervention (at 3rd week). Data were analyzed using a paired t-test.

[Results]

There were statistically significant improvements in FMS proficiency and lower extremity functional strength after the intervention. The FMS result showed that there were significant differences between mean Gross Motor Quotient (GMQ) before and 3rd-week interventions ($p < 0.001$). There was also a significantly difference between the mean lower extremity strength score before and 3rd-week interventions ($p = 0.006$). Although, static balance (Left and Right) before the intervention was not significantly different from that 3rd-week intervention.

[Conclusion]

The three-week structured exercise program showed effective improvement in the FMS proficiency of the children with DS. However, future studies are necessary to endorse and expand these findings.

O-3 The Additional Effects of Hip Muscles Strengthening Exercises on Lumbar Muscle Strength and Functional Ability in Patients with Chronic Low Back Pain

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[Background and Purpose]

Low back pain is the most common musculoskeletal condition affecting the adult population and nearly 60-80% of people throughout their lifetime. Patients with low back pain experience a decrease in lumbar muscle strength, endurance, flexibility, limitation of lumbar and lower limb joint range of motion. In addition, hip-flexor, hip-adductor, and abdominal-muscle fatigability had a significant association with low back pain in a multifactorial cross-sectional study of 600 subjects with low back pain. The lumbar stabilization exercises lead to a reduction of mechanical stress on spinal structure while performing the functions of daily life. Hip muscle strengthening exercises reduce excessive movement of the lumbar segment and correct the alignment of pelvic and spine, and then cause the proper isometric contraction of trunk muscle thereby relieving low back pain. Therefore, the present study aimed to assess the additional effects of hip muscles strengthening exercises in patients with chronic low back pain.

[Participants]

Total 70 chronic low back pain patients (35 in each group) from Yangon General Hospital and National Rehabilitation Hospital were participated.

[Methods]

This study was Hospital-based randomized comparative study. The patients were randomly assigned to two groups: Group A, Infra-red and lumbar stabilization exercises (LSE) plus hip muscles strengthening exercises for 50 minutes and Group B, Infra-red and LSE only for 30 minutes. The improvement of lumbar muscle strength was measured by using back strength dynamometer and functional ability was assessed by using Modified Oswestry Disability Questionnaire respectively. The patients were given treatment program for three sessions per week up to six weeks. The assessments were done before and after intervention. An analysis was conducted with pre-post comparison using Paired-t test and two groups comparison using Student's-t test. A probability of p value < 0.05 was considered to be statistically significant.

[Results]

A significantly greater improvement in back muscle strength and functional ability ($p < 0.001$) and ($p < 0.017$) in Group A than Group B after six weeks of intervention.

[Conclusion]

Both LSE and hip muscles strengthening exercises had statistically beneficial effect on lumbar muscle strength and functional ability in chronic low back pain patients. Therefore, these exercise programs are safe to use in clinical situation. However, further studies should be done on the long-term effect and community base nationwide study is needed for public awareness, prevention and risk factors reduction. The present study used gravity for resistance to improve back muscle strength and increase functional ability. For the better outcome results, more challenge/difficult treatment techniques should be considered.

O-4 Effect of muscle energy technique (MET) on patients with adhesive capsulitis

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[Background and Purposes]

Adhesive capsulitis (AC), also known as frozen shoulder, is one of the common causes of shoulder pain, presenting approximately about 2-5% of the general population. The patient experiences stiff and painful shoulder with consequences of progressive restriction of active and passive range of motion in all planes leading to functional difficulties. Muscle Energy Technique (MET) is soft tissue manipulation technique that involves the voluntary contraction of patient muscle in an accurately controlled direction and intensity against a resistance by the physiotherapist. It can be used to stretch or lengthen shortened muscle and fascia, to reduce tightness, to promote fluid mechanics and decrease local edema, and to mobilize restricted joints. There are numerous studies implicating the efficacy of Muscle Energy Technique (MET) and conventional therapy in treating AC. The purpose of this study is to examine the effect of the MET alone on patients with AC.

[Participants]

A total of 54 patients with stage II AC aged between 18 years and 77 years (mean age 56.69±9.79) participated in this study.

[Methods]

Patients with AC were assigned into two groups (27 in each group) with block randomization. The group-A received MET with short wave diathermy (SWD) while group-B received conventional treatment with SWD. The treatment duration is 5 weeks. We measured the range of motion (ROM) for flexion, abduction and external rotation of shoulder joint, and shoulder pain and disability index (SPADI) at 0 day and 5th week. For descriptive statistics, a two-sample t-test and chi-square test were used. For comparison of variables within the same group, paired t-test was used. For comparison of variables between two groups, a two-sample t-test was used. The results were considered statistically significant if p value was less than 0.05.

[Results]

Both groups showed statistically improvement in all outcome measures at the end of treatment ($p < 0.05$). Comparison of SPADI between two groups showed statistically significant difference ($p < 0.001$) after the 5th-week intervention. Intergroup analysis showed significant difference in shoulder ROM of group-A in comparison with group-B at week 5 ($p < 0.05$).

[Conclusion]

In this study, both interventions were effective in alleviating pain and in improving functional ability and ROM for patients with AC. However, comparing the improvement within the interventions, MET had a remarkable rate of improvement in reducing SPADI scores and improving ROM. So, this study proved that MET is more effective for decreasing pain and increasing ROM and functions. This study is limited to patients with stage II AC so the future study should be performed in all stages of adhesive capsulitis.

O-5 Effects of a Structured Functional Exercise Program on Primary Prevention of Ankle Sprain in Football Players

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[Background and Purpose]

An ankle sprain is one of the most common lower limb injuries in general and athletic populations. It is one of the most common sports injuries in Myanmar athletes especially in football players about 15% (212 out of 1413 athletes) in the 2017 calendar year. Many researchers found that the proprioceptive training program, balancing training, and functional training effectively reduced the rate of recurrent ankle sprains. Although these programs are effective in secondary prevention of ankle sprain, the effects of these programs on primary prevention are still lacking in the athletic population. Primary prevention of ankle sprain means “athletes who have no previous history of ankle sprain”. Therefore, there was a need to find out the effects of a structured functional exercise program (SFE) involving the combined effects of balance training through proprioception and lower extremity strengthening exercises on the primary prevention of ankle sprain in football players. Thus, the purpose of this study was to find out the effects of the SFE program on the primary prevention of ankle sprain in Myanmar football players.

[Participants]

Total 60 football players with no history of ankle sprain aged between 14 and 19 years (mean age: 16.6±1.5 years), 70% boys (n=42) from Kyaikkasan Sports Ground, Yangon participated.

[Methods]

The study was a quasi-experimental one-group pretest-posttest design. The participants received the SFE program plus routine training throughout 1000 sport training hours from April 2018 to March 2019. The SFE program were the components of five balance exercises through proprioception and five lower extremity strengthening exercises. Five balance exercises using a balance mat included single-leg squat, single-leg stance while swinging raised leg, passing the ball, single-leg stand passing the ball, and single-leg stand bouncing the ball. Five lower extremity strengthening exercises were forward and backward squat jump, vertical squat jump, lateral squat jump, single-leg lateral hop, and speed bounding stride. The total time taken for SFE was 30 minutes. The SFE program was given once a day, six days per week for 45 weeks. The primary outcome measures were balance and lower extremity strength using Stork Balance Stand Test and 6-meter Timed Hop Test. This study used a self-reported number of ankle sprain throughout sports training 1000 hours as a secondary outcome measure. Data analysis was conducted with pre-post comparison using a Paired t-test. A significant level was set at $p < 0.05$.

[Results]

Balance and lower extremity strength were significantly improved ($p < 0.05$) after 45 weeks of intervention. The self-reported number of ankle sprain was 1.7% (n=1) throughout sports training 1000 hours.

[Conclusion]

The SFE program improved balance and lower extremity strength. Balance training through proprioception and lower extremity strengthening exercises reduced the incidence of ankle sprain per 1000 hours of exposure. Thus, the SFE program was effective in the primary prevention of ankle sprain in football players. The findings of the current study were safe, effective, and reliable to use in various sports especially in football players.

O-6 Long-term effects of exercise therapy using group guidance on the toes for middle-aged and elderly people

Materna Weili¹⁾ Ko Onoda^{1,2)} Hitoshi Maruyama¹⁾

- 1) Graduate school of International University of Health and Welfare
- 2) International University of Health and Welfare

[Background and Purpose]

In recent years, various reports have been obtained on the toes function. It has been suggested that toe gripping force and toe compression force are related to walking function and balance function, suggesting that functional improvement can be achieved by performing toe gripping strength training regardless of age. Has been done. Regarding the intervention method of toe function training, in the case of independent practice in the elderly, there are drawbacks such as low motivation for practice and poor continuity. There are roughly two types of exercise provision methods for the elderly: individual exercise and group instruction, and the exercise effect was enhanced by group instruction. The purpose of this study was to investigate the long-term effects of longitudinal arch height and toe gripping force by the intervention of exercise therapy using group guidance on the toes in middle-aged and elderly people.

[Subjects and Method]

Twenty subjects (age: 68.0 ± 6.3 years) were given consent to cooperate with the research by women attending the regional exchange center, and 10 subjects were randomly assigned to the group guidance group and 10 subjects to the control group. divided. The period was 3 to 4 times a week for a total of 8 weeks. The measurement items were vertical arch height and toe gripping force. It was subjected to the same measurements before and after the intervention of each group.

[Results]

In the group guidance group, there were significant differences in longitudinal arch height and toe retention after the intervention compared to before the intervention. In the control group, there was a significant difference in the gripping force.

[Conclusion]

In this study, we investigated the long-term effects of longitudinal arch height and toe gripping force by the intervention of exercise therapy using group guidance on the toes in middle-aged and elderly people. As a result of this study, it was found that the toe gripping force was significantly increased by the intervention of towel gather, rock-paper-scissors, and Hohmann exercises in the control group. In the group guidance group, it was suggested that the intervention of towel gathering, rock-paper-scissors, and Hohmann gymnastics in the group did not increase the toe gripping force, but also increased the vertical arch height. The muscles that contract due to gymnastics exercises may be isometrically contracted due to the alternating and repeated contractions that antagonize each other, and that the movement of the toes is learned and the dexterity is improved. On the other hand, it has been reported that the group movement was effective in the mental aspect of the subjects. The current situation is that exercise therapy is reluctant to voluntary exercise therapy. Especially because it may become sloppy or selfish over time, and people gather using local facilities to re-instruct and understand the regular correct posture and training by group instruction. Can be confirmed, and it is thought that the effect of the long-term intervention will be improved. From these results, the toe gripping force was significantly increased by the 8-week intervention of towel gather, rock-paper-scissors, and Hohmann exercises. It was suggested that the toe gripping force and the vertical arch height were improved by 8 weeks of the intervention of gymnastics collected by humans and using group guidance. And, it is considered that the exercise therapy using the group instruction to the toes has a better practice effect than voluntary exercise therapy.

As a limitation of this study, only middle-aged women were examined. In the future, it will be necessary to conduct group guidance exercise interventions for the elderly and men, and to clarify the effects of group guidance interventions while measuring other evaluations.

**O-7 Effects of inner muscle training with the semi squat standing position
using the transversus abdominis muscle thickness**

Minghui Qu¹⁾ Ming Huo^{2,3)} Hitoshi Maruyama¹⁾ Ko Onoda¹⁾

1) Graduate school of International University of Health and Welfare

2) Beijing Sanhuan Cancer Hospital 3) Himeji Dokkyo University

[Background and Purpose]

In recent years, the importance of deep trunk muscles has been shown mainly in orthopedic diseases and central nervous system diseases, and various exercise therapies have been developed. However, abdominal lateral muscle activity and exercise therapies in the standing position were shown. Currently, there are few reports.

The purpose of this study was to investigate the changes of the thickness of the transverse abdominal muscle (TAM) after inner muscle training intervention with the semi squat standing position.

[Subjects and Method]

The subjects were 23 healthy females who were divided into their groups: a inner muscle training with the semi squat standing position (IMT) group, the semi squat standing posture (SSP) group and a control group. The thickness of the TAM was measured under 5 conditions: (1) at rest, (2) maximal contraction of the TAM, (3) maximal contraction of the PFM, (4) maximal co-contraction of both the TAM and PFM, and (5) maximal co-contraction of both the TAM and PFM using a Thera-band®. The TAM thickness was measured before and after training in each group using an ultrasound. Subjects in the IMT group were provided with an 8-week the TAM and the pelvic floor muscles (PFM) co-contraction training with lateral resistance added to both knees using a Thera-band® program.

[Results]

The IMT group resulted in a significant improvement of TAM thickness in all conditions. The SSP group resulted in a significant improvement of TAM thickness in the maximal co-contraction of both the TAM and PFM using a Thera-band®.

[Conclusion]

Our study suggests that inner muscle training with the semi squat standing position can improve the inner muscle function in healthy females.

O-8 Research progress of microglia and Alzheimer's disease

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[Purpose of review]

Microglia (MG) are macrophages from brain and bone marrow, which have the functions of clearing plaque, pruning synapse and regulating neuron development. They can produce and release a large number of inflammatory factors to play an immune role in the central nervous system. Alzheimer's disease (AD) is a common degenerative disease of the central nervous system with cognitive impairment as its main manifestation. Its specific pathogenesis is still unclear. This review focuses on the structure and function of microglia and its role in the A β cascade hypothesis and Tau protein hypothesis of Alzheimer's disease. Objective to provide a new theoretical basis for pathological prevention and treatment of Alzheimer's disease.

[Recent findings]

The main pathological changes of AD are neurofibrillary tangles (NFTs) formed by abnormal hyperphosphorylation of Tau protein, extracellular senile plaques (SP) formed by abnormal deposition of β -amyloid (A β) and neuronal damage. Activated MG can inhibit the development of AD by scavenging intracellular A β deposition, eliminating toxic Tau protein, phagocytosis of dead cells and toxic cell mediators. However, over-activated MG can aggravate AD development. The effects of MG on the brain depend on the type and intensity of the stimulation, so a potential therapeutic strategy for detecting A β aggregation could be developed if the beneficial properties can be selectively exploited without stimulating and promoting the inflammatory response.

[Summary]

AD is a senile disease with complex etiology and pathogenesis, and clinical treatment is difficult. MG is an important factor in the occurrence and development of AD. MG-mediated inflammatory reaction plays a dual role in the pathogenesis of AD. The A β hypothesis and the Tau protein theory also interact due to the action of MG, but the mechanism still needs to be further explored. Nevertheless, the research progress in the relationship between MG and pathogenesis may provide effective help for the immunotherapy of AD.

O-9 Effect of biofeedback combined with Pilates training on post-prostatectomy incontinence

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[Background and Purpose]

Prostate cancer is a complex and potential disease that affects people's daily life. The number of prostate cancer ranks second among the male cancers worldwide, with approximately 1.1 million affected each year. Removal of the prostate and surrounding tissues results in urinary incontinence. Current first-line treatments are mainly behavioral therapy and conservative treatment with physiotherapy involvement. Previous studies have found that Pilates exercise can improve pelvic floor muscle strength, which in turn relieves urinary incontinence symptoms. However, there are very few previous reports on the related training of combining Pilates training with biofeedback. Therefore, the main purpose of this study was to investigate the effects of Kegel training alone, biofeedback combined with Kegel training and biofeedback combined with Pilates training on post-prostatectomy incontinence.

[Methods]

42 patients were randomly divided into Kegel training alone group (14), biofeedback combined with Kegel group (14), and biofeedback combined with Pilates group (14). The changes occurring to the Kegel training group, biofeedback combined with Kegel training group and biofeedback combined with Pilates group before and after treatment and the differences among the three groups were assessed by 1-hour pad test, number of urinary incontinences, ICIQ questionnaire and Oxford Grading Scale. The three groups were required for daily training for 8-week period.

[Results]

In the primary and secondary results, there were statistically significant differences between and within the three groups before and after treatment ($P < 0.05$). The graph results showed that the effect began to appear after 3 weeks of treatment, and a significant effect occurred at the 8th week of treatment.

[Conclusion]

All three training methods can optimize the urinary continence ability, pelvic floor muscle strength and activities of daily living of patients with post-prostatectomy incontinence. The treatment effect of Pilates combined with biofeedback training was better than Kegel combined with biofeedback training, but there was no statistical difference in the main results. It is particularly important to understand the time window for patient training and mobilize the enthusiasm of patients.

O-10 Study on the difference value of contraction time between multifidus and erector spinae in patients with chronic nonspecific low back pain

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[Background and Purpose]

Low back pain has become a major public health problem worldwide. Epidemiology shows that 80% of people have acute low back pain symptoms at least once in their lifetime, and about 5% ~ 10% of these people become chronic low back pain due to the prolonged course of disease over 12 weeks. Chronic nonspecific low back pain accounts for 85% of patients with chronic low back pain. Chronic nonspecific low back pain is a kind of low back pain syndrome without clear and known pathological cause. Lumbar muscle dysfunction is common in patients with chronic nonspecific low back pain.

There have been many studies using surface electromyography (EMG) to evaluate multifidus and erector spinal muscles in patients with low back pain, including flexion relaxation ratio, muscle fatigue, and muscle activation sequence. However, there is a lack of research on the difference value of muscle contraction time.

Therefore, the purpose of this study is to explore the difference value of contraction time between multifidus and erector spinae muscle in patients with chronic nonspecific low back pain, so as to provide an objective basis for the diagnosis of low back pain.

[Methods]

Seven subjects were randomly selected to measure the handedness or low back pain side. At L4, ultrasound was used to locate the multifidus and erector spinae muscles, and then surface electromyography was used to attach electrodes to the corresponding parts. The subjects were asked to do hip extension in prone position for 3 times, and the starting contraction time of multifidus and erector spinal muscles during the exercise was recorded. The cross-sectional area of multifidus, the thickness of transverse abdominis muscle, functional reaching test, TUG and 10m walking test were measured.

The statistical method was independent sample t-test.

[Results]

The difference value of contraction time between multifidus and erector spine muscle and the thickness of transverse abdominis muscle were different between normal people and low back pain patients.

[Conclusion]

In this study, it was found that there were differences in the contraction time difference between multifidus and erector spinal muscles in normal subjects and patients with chronic nonspecific low back pain, suggesting that the contraction time difference could be used as the basis for the diagnosis of chronic nonspecific low back pain. More subjects will be recruited in the future and the data will be analyzed using logarithmic regression.

O-11 The risk ratio of the contraction time difference of the multifidus and erector spinae for low back pain

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[Background and Purpose]

Chronic nonspecific lumbosacral pain or discomfort over 3 months, with or without radiation pain in the lower extremity, is one of the most intractable and common chronic pain in the field of rehabilitation medicine. In recent years, the incidence rate has increased significantly, and the trend is younger. The cause of the disease is often closely related to occupation or work environment. At present, there are related literatures on the contraction time, thickness and cross-sectional area of the multifidus muscle in low back pain, but there is no related research on the contraction time difference between the multifidus and erector spinae and the time difference, so this study wants to explore The risk ratio of the difference in contraction time between the multifidus muscle and erector spinae that produces low back pain.

[Methods]

The morphology of the lumbar multifidus and erector spinae of 7 patients with CNSLBP were measured by musculoskeletal ultrasound. Observed indicators included thickness at rest and changes in cross-sectional area, and the correlation between morphological indicators and behavioral data was analyzed.

Place the electrode pads on the erector spinae and multifidus muscles on the side of the back pain. Each muscle to be tested has 2 electrode pads, and the distance between the two electrode pads is 2 cm, parallel to the long axis of the muscle fiber to be tested. Place a 2.5cm electrode next to the L4~5 spine of the multifidus muscle, and place another electrode under the electrode. Place an electrode on the rectus muscle 3cm next to the L4~5 spine, and place another electrode under the electrode. The subjects stretched their buttocks in a prone position and recorded surface EMG signals during exercise.

The statistical methods are LAC curve and correlation and linear regression.

[Results]

After processing the data of 7 subjects, it was found that the EMG difference between the multifidus muscle and the erector spinae muscle was significantly correlated with the thickness of the transverse abdominis muscle and was negatively correlated.

[Conclusion]

At present, it has been found that the EMG difference between the multifidus muscle and the erector spinae muscle is related to the thickness of the transverse abdominis muscle. In the future, we will continue to collect more data from subjects and find out the hazard ratio of the EMG difference to provide a basis for clinical diagnosis.

O-12 Effects of fixing flexi-bar training on motor function for patients with stroke at recovery stage

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[Background and Purpose]

To investigate the effects of Flexi-bar training on movement, balance, postural control and activities of daily living, in chronic stroke patients with hemiplegia. With the help of surface electromyogram, we also tried to explore the underlying mechanisms of this rehabilitation protocol based on which a novel rehabilitation therapy was proposed for chronic stroke patients.

[Methods]

Forty-five stroke patients with hemiplegia were randomly divided into control group (CG, n=23) and Flexi-bar group (FG, n=22). The patients in FG received a conventional rehabilitation treatment plus Flexi-bar training lasting 4 weeks. The patients in CG just received a conventional rehabilitation therapy lasting 4 weeks. All subjects were evaluated with standard scales (Fugl-Meyer motor function, FMA; Fugl - Meyer balance Function, FMB; Barthel index, BI; postural assessment scale for stroke patients, PASS) and surface electromyography (rectus abdominis, external oblique muscle, internal oblique muscle and erector spinae of affected side) pre and post treatment.

[Results]

① There is no significant differences in FMA, FMB, BI and PASS between CG and FG before treatment ($P > 0.05$); significant differences were found in FMB, PASS and BI between two groups after treatment ($P < 0.05$). No significant difference between two groups in FMA after treatment ($P > 0.05$) ② No significant differences were found between two groups in SEMG amplitude of rectus abdominis, external oblique muscle, internal oblique muscle and erector spinae before treatment ($P > 0.05$). The SEMG amplitude of rectus abdominis, external oblique muscle, internal oblique muscle and erector spinae turned out to be significantly different between CG and FG at the endpoint ($P > 0.05$).

[Conclusion]

Flexi-bar training, probably a promising rehabilitation protocol, could improve the balance and daily independence of chronic stroke patients. More studies should be recommended to investigate the underlying mechanisms and feasible rehabilitation protocols for stroke patients.