

4th Euro-Global Physiotherapy Congress 2017

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Scientific Tracks & Abstracts Day 1

Euro Physiotherapy 2017



**Physiotherapy Techniques and Exercises /Sports &
Physiotherapy/Advancements in Physiotherapy/Manual
Physiotherapies/Rehabilitation Methods**

Session Chair
Tomasz Karski
Poland

Session Co-chair
Filippo Pucciani
Italy

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The effect of a 5-week group-based exercise program on strength, balance, mobility, and gait in the older adult population: A pilot study

Carol A Maritz, Chopra S, Dougherty C, Johnston M, Curran G and Maritz C A
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Background: Falls are also the fifth leading cause of death among adults aged 65 years and older. Lower extremity weakness and decreased balance are two important risk factors associated with falls in the older population. Current research suggests that in order to produce effective outcomes, an exercise program for older adults needs to be at least 10 weeks in length.

Methods: 18 of 23 participants over the age of 60 years (17 female, 1 male; mean age 74 years) completed this pre-test-post-test design. The participants tested on the following outcome measures: 30-second Chair Stand test for lower extremity strength, Four Square Step test (FSST) for dynamic balance, timed up and go (TUG) test for mobility, Activity-Specific Balance Confidence Scale (ABC) for balance confidence and GAITRite® for forward and backward walking velocity. Participants attended a 45-minute group-based exercise program twice a week for 5 weeks at a local church. The program included a 5-minute warm up, 10 minutes of stretching, 20 minutes of strengthening for both upper and lower extremities with

resistance as well as core work, 5 minutes of balance training and 5 minutes of cool down exercises.

Results: A significant difference was found in the pre- and post-test measures of backward gait velocity ($p=.034$), forward gait velocity ($p=.016$), 30-second Chair Stand Test ($p=.001$), TUG ($p=.022$), and the FSST ($p=.001$). Although there were no statistically significant differences found in the ABC scale, the overall scores increased.

Conclusion: This 5-week group-based exercise program was effective at improving forward and backward gait velocity as well as decreasing the clinical risk for falls in older adults. It is recommended that elements of this program be incorporated into physical therapy practice. Additionally, upon conclusion of physical therapy treatment, older adults should be encouraged to participate in community-based group exercise programs to maintain overall health and wellness and prevent future falls.

Biography

Carol A Maritz has received her certificate in Physical Therapy from Hahnemann University in Philadelphia in 1981 and her Master's degree in Gerontology in 1988 from Saint Joseph's University. In 2004, she has received her Doctorate in higher education from Nova Southeastern University. She has practiced in the following settings: acute, skilled nursing, outpatient and home care with a focus on the geriatric patient. She has started her academic career as a Physical Therapy Faculty Member at Hahnemann University in 1995 and is currently a Professor of Physical Therapy and Associate Dean at University of the Sciences. Her research focuses on the use of exercise to prevent falls in the older population. She has presented and published her research both nationally and internationally.

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 Notes:

Relationship of backward walking to clinical outcome measures used to predict falls in the older population: A factor analysis

Carol A Maritz, Silbernagel K G and Pohlig R
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Background: Backward walking has been found to be a more sensitive measure to detect fallers than forward walking. It involves greater reliance on neuromuscular control to make up for the lack of vision. In fact, backward walking speed has been determined to more accurately identify fallers in the older population than forward walking. This study examined if backward walking measures more than one underlying factor while also the examining the relationship between it and other clinical measures used to identify falls risk.

Methods: A convenience sample of 57 older adults (10 males and 47 females) with a mean age of 78.8 years (SD 8.9 years) participated in this cross-sectional study. Subjects walked backward on the computerized walkway system recording gait velocity, stride and step length, stance and swing time, single and double support. Additionally, subjects were tested on clinical measures commonly used to assess falls risk. An exploratory factor

analysis was performed on various aspects of backward walking. Factor scores were found and then correlated with the selected clinical measures.

Results: Results revealed that there are 2 factors associated with backward walking: cadence and velocity. Cadence was only mildly correlated to one measure whereas velocity was highly correlated with each of the known predictors of falls used.

Conclusion: Given these findings, a clinician could quickly measure backward walking velocity and count the number of steps an individual takes in order to screen those at-risk for falls.

Biography

Maritz C A has received her certificate in Physical Therapy from Hahnemann University in Philadelphia in 1981 and her Master's degree in Gerontology in 1988 from Saint Joseph's University. In 2004, she has received her Doctorate in higher education from Nova Southeastern University. She has practiced in the following settings: acute, skilled nursing, outpatient and home care with a focus on the geriatric patient. She has started her academic career as a Physical Therapy Faculty Member at Hahnemann University in 1995 and is currently a Professor of Physical Therapy and Associate Dean at University of the Sciences. Her research focuses on the use of exercise to prevent falls in the older population. She has presented and published her research both nationally and internationally.

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 Notes:

Effectiveness of sustained natural apophyseal glides and Maitland's mobilization in facet joint syndrome: A randomized control trial

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Background: Low back pain is a major cause of disability affecting performance at work. One of the hidden and less studied culprit of chronic low back pain is facet joint syndrome. Currently, there is paucity in the literature regarding the effectiveness of physiotherapy techniques in treating facet joint syndrome. Hence this trial was undertaken to study the effectiveness of passive accessory intervertebral movement (PAIVM) such as Maitland's mobilization and passive sustained accessory mobilization, such as Mulligan's technique (SNAGs) along with conventional physiotherapy intervention as compared to conventional physiotherapy in facet joint syndrome.

Method: A single-blind, randomized control trial was conducted on participants diagnosed with lumbar facet joint syndrome. Outcome measures for the study were Visual analogue scale (VAS), Modified Oswestry disability questionnaire (MODQ), Pressure pain threshold (PPT), Back muscle endurance, Spinal flexion and extension ROM. After baseline assessment, participants were randomly assigned to Group A which received Mulligan's sustained natural apophyseal glides (SNAG'S), therapeutic ultrasound (Cont. 1MHz, 1.5W/cm²) and spinal

exercises, Group B received Maitland's spinal mobilization (PA Glides), therapeutic ultrasound and spinal exercises and Group C received therapeutic ultrasound and spinal exercises for the period of 2 Wks. Follow up was done at 3rd wk.

Result: Total 186 participants were analyzed using Kruskal-Wallis test and Dunn-Bonferroni post hoc Test. K-W test showed a significant difference in all three groups in terms of VAS, MODQ, PPT and Spinal ROM. Post Hoc test showed the significant difference ($p < 0.001$) between SNAGs and Maitland Group in terms of flexion and extension ROM and there was no significant difference ($p > 0.05$) between SNAGs and Maitland's manual therapy groups in terms of pain, MODQ and PPT.

Conclusion: SNAGs is more effective in improving spinal ROM, however SNAGs and Maitland's spinal mobilization are equally effective in reducing pain, disability and improving pressure pain threshold. Back muscle endurance improved in all the three groups, but the difference was not statistically significant.

Biography

Deepak Anap is currently working as Professor and Head of Musculoskeletal Physiotherapy Department of DVVPF, College of Physiotherapy, Ahmednagar (INDIA). He has completed his Ph.D with research in lumbar facet syndrome. He has published more than 45 research papers and co authored a chapter in book on radiology. He received long term research grant from Maharashtra University of health Sciences Nashik for his research on facet joint.

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Vitex nigrundo phonophoresis: A key for pain free life in knee osteoarthritis

Abhijit Merekar

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Background: Osteoarthritis is a progressive disease. It is the “most common form of joint disease in the world” (Merck, 2002). Various invasive and noninvasive treatments are available for OA knee management. Physiotherapy along with pharmacological management can prove better outcomes in Knee pain cases. Objective of our study was to find out effectiveness of Diclofenac sodium phonophoresis and Vitex Nirgundo phonophoresis along with knee exercises in Osteoarthritis.

Method: In this Randomized control trial, 32 diagnosed cases of Grade II knee osteoarthritis without any other knee pathology were divided in two groups using computer generated random numbers. First group was treated with Diclofenac sodium phonophoresis along with Quadriceps strengthening and active knee exercises and second group was treated with Vitex Nirgundo Oil phonophoresis along with Quadriceps strengthening and active knee

exercises for 2 weeks. Outcome measures such as Pain (VAS score) and WOMAC score was assessed at baseline and at the end of 2 weeks.

Results: On analysis using unpaired t Test showed significant difference in two groups ($p < 0.005$). Pain intensity and knee disability using MODQ score showed more improvement in Group two. (i.e. Vitex nigrundo group).

Conclusion: Vitex Nirgundo Oil phonophoresis along with physiotherapy is more beneficial than diclofenac sodium phonophoresis in knee osteoarthritis cases.

Biography

Abhijit Merekar is currently working as Associate Professor, Department of Pharmaceutics at Dr.Vithalrao Vikhe Patil Foundation's, College of Pharmacy, Ahmednagar (India). He has completed his PhD with research on antihypertensive drugs. He has published more than 29 research papers. He has also attended 17 national and state level seminar and 35 posters presented. He received long term research grant from Savitribai Phule Pune University (formerly University of Pune and University of Poona) for his research on treatment of cancer by wheat grass Juice. He received various prestigious awards in multidisciplinary research.

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 Notes:

A rigorous ethical approach to normativity: Insight into physiotherapy practice for disabled and enabled patients

Martine Same

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A rigorous ethical approach to normativity: insight into physiotherapy practice for disabled and enabled patients. Philosophy and physiotherapy are too often considered as distinct and divergent disciplines whereas they both seek to investigate and solve the question of “what could be the best way for human beings to live?”. By studying direct links to practical examples in which an ethical approach to norms is required (assessments, manipulations...), we will show the importance of relating the bases of ethics to a physiotherapy setting. On a large scale, the relevance to physiotherapy is that the insight it provides can benefit professional and patient coherent reasoning and health caring with respect to individual abilities and situations. Such an approach helps focus on

the patient as a human being, able to propose or expect a personal response to his disabilities and-or- enabilities, and invites new challenges to normalizing assumptions. A different practice could thus be redesigned, which could raise the credibility of the profession as a whole; since this fight to keep a rigorous human touch can offer truly augmented human capabilities to live a full life.

Biography

Martine Same began her career as a Teacher of French Language and Literature in England and of English Language in grammar schools in Haute-Savoie (France). She then followed studies in Physiotherapy, and specialized in re-education (rehabilitation). She worked 20 years in the Paris region, both as a Physiotherapist and as a Teacher of Physiotherapy. She still teaches Physiotherapy and has been appointed as Director of the Collection Philosophy, Ethics and Health (Connaissances et Savoirs editions) in 2016. Since gaining Doctorates in Educational Science and Philosophy, she has spent several years researching and joining discussions on ethics with health professionals and philosophers, concerning the theme of what philosophy can bring to the world of functional re-education and rehabilitation. Over the last ten years she has taught, and drawn attention to, the relevance and importance of this approach, especially through the publication of her thesis in Practical Philosophy and through the writing of articles and books on the subject.

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 Notes:

Personalized system of longevity and wellbeing: Based on life style analysis with prediction, psychological shock, alimentary behavior change and remote physical activity monitoring

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By being born, the human spirit and the human body set off on a journey together. More often than not, along this journey and from childhood, humans start abusing and destroying their body through excessive eating, smoking, drinking (alcohol), and the lack of proper physical activity. Humankind has developed a host of technological skills, technical tools and devices in order to manage everything around them from an office or home. Nowadays many professionals do not need to exercise any physical activity. They work from a PC and are able to cover the whole world. In such a highly developed environment, one might presume the human being to be healthy and remain well-preserved in old age. Our study question was very simple: what kind of problems will arise in such a technologically and technically revolutionized era relating to people's health. Unfortunately, the same technological and technical revolution that create prosperity, also give rise to many adverse and unexpected issues. The most adverse impacts on our health can be attributed to fast food made by new technologies and to a sedentary lifestyle. The worldwide prevalence of obese and overweight people is rising as a consequence of this kind of lifestyle and other comorbidity factors. Therefore the aim of this study is to present a personalized system of longevity and wellbeing. This system involves the creation of a data base to collect information from individuals, including data monitored by means of remote healthcare devices. Then, a specialized program will predict the health condition of these individuals in 5, 10, 15, 20 years of time. In

some circumstances, those who eat excessively without engaging in proper physical activity could thus experience a psychological shock which might be the triggering factor to change their life style. The main goal of our system is to monitor the alimentary behavior of individuals in order to induce them to control and reduce their daily food intake. A personalized program of longevity and wellbeing will then be created for each participant in accordance with their specific genetic, constitutional, ethnic and metabolic factors. Physical and physiological conditions will be monitored. Environmental and other factors (weather, habitat, profession) will be taken into account. Special devices for remote electrophysiological monitoring to control health condition, including such cardio-vascular parameters as heartbeats, arterial pressure, EKG, respiratory rate and depth changes during exercises and physical activities are developed. Special casual wear is designed to be fitted on the backbone, hip and knee joints preserving devices. A special herbal compound to reduce craving is being tested as a food supplement. In our preliminary results, endemic herbal plants collected from the Kara Tau Mountains in the South Kazakhstan region were found to be extremely helpful in reducing food craving. In future this personalized system of longevity and wellbeing will be integrated into a new social network of people willing to keep their body in good and healthy condition as long as possible.

Biography

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 Notes:

Nutrition prescription in rehabilitation and subsequent injury prevention in active individuals and athletes

Tina Cloney

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Nutrition plays a crucial role in fitness, performance, recovery and healing. Appropriate nutrition and fluid regimens are vital to the prevention and treatment of injury in active individuals and athletes. Inadequate nutrition and fluid intake can result in undesirable cardiovascular system, central nervous system, and gastrointestinal system effects placing the individual and/or athlete at a greater risk of injury. Nutrition is often overlooked as an adjunct treatment option in the treatment of injury. Available energy balance and sufficient carbohydrate, protein, micronutrient and fluid consumption play a crucial role in the provision of vital nutrients in addition to the

suppression of catabolic hormones, release of anabolic hormones, promotion of subsequent tissue repair and the healing process. Nutrition and fluid recommendations for the treatment and prevention of injury for active individuals and athletes will be outlined as an adjunct therapy and in an effort to enhance the overall effectiveness of various types of rehabilitation. These nutrition recommendations also serve to provide practical guidelines to providers and/or practitioners in various types of professional settings for their patients and clients.

Biography

Tina Cloney is a Health and Nutrition Professor in the Department of Exercise Science and Sport. She has a Bachelor's degree in Health, Nutrition, and Dietetics. She has completed her Master's degree in Community health, and a Doctoral degree in Public Health, Health Education and Health Promotion. She is also a Board Certified Registered Dietitian, Board Certified Sport Specialist Dietitian, and a Board-Certified Diabetes Educator. Before joining Millikin, she has worked for over 20 years as an Educator and Manager in various clinical and community capacities.

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 Notes:

Influence of educational biomechanics for correcting the plantar pressure pattern of recreational runners

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Introduction: Changes in dynamic foot loading, high or low plantar arch and shoe cushioning have been risk factors associated with many overuse injuries in lower limbs of runners^{1,2,3,4}. Foot alignment is another important risk factor, which may alter plantar distribution pattern of the foot⁵. However, the literature is still a lack of evidence on educational strategies of these risk factors to change plantar pressure, especially as prevention of the risk of injury. Further studies are needed to investigate the strategies to dynamic plantar pressure change in runners based on the risk factors most associated with foot injuries. Therefore, the purpose of this study was to investigate the influence of educational biomechanics strategies for correcting the plantar pressure pattern in feet regions different of recreational runners.

Materials & Methods: Twelve recreational runners were evaluated: 24 feet total assessed (45.4±8.1 yr, 69.6±14.0 kg, 1.68±9.2 m). The plantar pressure was evaluated by pressure platform system during static posture. All runners exhibited a heel strike pattern of running. Soon after this evaluation, the runner was invited to participate in 2 lectures with biomechanical themes of the risk factors associated with lower limb injury. The first lecture is on

pain and impact overload in feet and the second on foot posture and shoe types. Each lecture with 20 consecutive minutes was followed by 10 minutes for questioning with the speaker. Two weeks after the lectures, all the runners were re-evaluated. Maximal force, peak pressure and contact area were evaluated over the lateral and medial rearfoot, midfoot and forefoot. The data were processed in a custom written Matlab function. Dependent variables, pre and post lecture, were compared by paired t-test ($p < 0.05$).

Results: Variables related to maximum force in midfoot was reduced post lecture (pre: 19.4±15.2; post: 15.2±11.4, $p=0.04$), peak pressure increased over forefoot (pre:1409.0±264.6; post:1508.2±208.2, $p=0.03$) and the lateral (pre:276.7±50.1; post:309.6±58.7, $p=0.01$) and medial (pre:287.1±53.8; post:316.9±61.5, $p=0.01$) rearfoot. Contact area showed no significant difference over the lateral and medial rearfoot, midfoot and forefoot (pre and post lecture).

Conclusion: The educational biomechanics lecture for correcting the plantar pressure pattern in feet regions different of recreational runners was not effective, leading to increased peak pressure on the forefoot and rearfoot (medial and lateral). These findings help to understand the need of the physiotherapist to train with exercise the better distribution of plantar load.

Biography

Warlindo Neto UNISA Professor Sports Medicine Specialist Brazilian Athletics Federation Doctor Doctor of Brazilian Team in Rio 2016

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 Notes:

Effect of different body positions on lung dynamic functions in healthy young non-obese subjects

Abhijit Diwate

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Background: Frequent changes in body position and avoidance of prolonged period in any single position will minimize the risk of cardiorespiratory complications. Body positioning has potent and direct effect on cardio respiratory functions and dynamics. Hence the purpose of study was to find out effect of different body positions on lung dynamic functions and apply the results of study in a large population for therapeutic purpose.

Methodology: 50 young healthy non-obese subjects (29 females and 21 males) between age group 18-30 years were selected and Pulmonary Function Tests were done in six different positions (sitting upright, Reclined Sitting (crook), Supine, Prone, Right and Left Side Lying) in a Cardiorespiratory Laboratory of a Superspeciality Hospital. FVC, FEV, PEER, PIFR, FEV1, FVC, FEF 25-75%, SVC, VE, Vt, Vt/Ti and MVV were measured in six different positions. All the data was statistically analyzed,

and results were documented.

Result: There was statistical significant reduction in PFT parameters in all recumbent positions compared to upright positions ($p < 0.0033$). Further, prone position showed significantly higher flow rates and lung volumes when compared with supine position.

Conclusion: Hence we conclude that reference standard position of Upright sitting was the best position among all other positions. Subsequently, prone position was found to be more physiological than supine position.

Biography

Abhijit Diwate has completed his Bachelors in Physiotherapy from the Prestigious Maharashtra University of Health Sciences, Nashik (State Health University) in 2003 and the masters in Physiotherapy (Cardiovascular and Respiratory Physiotherapy) from the reputed University of Poona (also known as Oxford of the East) in 2007. He also completed his University Fellowship on Geriatric Physiotherapy Care in 2014. He is presently working as Professor and Head, Department of Physiotherapy in Cardiovascular and Respiratory Sciences as Dr. V.V.P. Foundation's College of Physiotherapy, Ahmednagar. He is an approved Undergraduate Teacher for Bachelor's program (since July 2007) and a recognized Post Graduate Teacher for Master's program (since July 2012) of the Maharashtra University of Health Sciences, Nashik (State Health University).

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 Notes:

Gait rehabilitation – contemporary methods

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The World Report on Disability defines the **goals of rehabilitation**: prevention of the loss of function; slowing the rate of loss of function; *improvement or restoration of function*; compensation for lost function; maintenance of current function. **Gait** is an important element of the everyday life functionality of our patients in rehabilitation practice, and is crucial for their independence in activities of daily living, respectively for their autonomy.

Our purpose is to emphasize the potential of some contemporary physical modalities for **balance training** and **gait recovery**, based on best practices and evidence-based research. Principal clinical and instrumental assessment and treatment methods are stated. Special attention is paid to: *functional electrical stimulations* (with low and middle frequency electric currents); *deep oscillation*; *manual therapy techniques* (tractions, mobilizations and manipulations); *proprioceptive neuro-muscular facilitation* (PNF) methods; *analytic exercises*, *device-assisted mechano-therapy* (passive, active or combined), etc. We insist on the importance of *technical aids* (wheelchair, canes, or walking sticks) and weight bearing (restricted, fractional or total) during the rehabilitation process. Future possibilities are cited, including potential of *internet-based educational courses*. We explain some **principles of balance and gait rehabilitation**, due to our modest clinical experience (of 30 years) and our own results in patients with conditions of the nervous and motor systems. Special attention is paid to *neurological and neuro-surgical rehabilitation algorithms – in patients with: post stroke hemiparesis, multiple sclerosis, Parkinsonism, traumatic brain injury (TBI), brain tumors, spinal cord injuries (SCI) with paraplegia; lumbo-sacral radiculopathy and diabetic polyneuropathy (DPNP) with femoral, peroneal or / and tibial paresis; or radiculopathies and peripheral paresis after neurosurgical intervention (for spinal trauma and discal hernia)*. Authors suggest '*Guidelines of operational standard procedures in rehabilitation after lower limb orthopedic surgery*': in patients with *acetabular, inter/transtrochanteric or distal femoral fractures, with gamma nail or vis – plaque*

endoprosthesis; joint replacement of lower extremities (hip and knee arthroplasty); ACL and PCL (anterior and posterior cruciate ligament) alloplasty; total and partial meniscectomy. Rehabilitation protocols for patients with *trans-femoral and trans-tibial amputations* are proposed. Our rehabilitation algorithms and guidelines are not intended to be construed or to serve as a standard of care. Standards of care are determined on the basis of all clinical data available for an individual case and are subject to change as scientific knowledge and technology advance and patterns of care evolve. **Typical and atypical clinical cases** will be presented, including patients with comorbidities, complex or multiple fractures, common or rare complications.

For effective gait rehabilitation the inclusion of a multi-professional therapeutic and **rehabilitation team** is obligatory. *Different models of organization of the teamwork* of the staff are applied: **interdisciplinary** (complex care of the patient from different scientific and professional disciplines); **multi-disciplinary** (role of every professional is completely independent from the others); **transdisciplinary** (everyone helps the work of the others; role and functions are distributed). We consider that the clinical practice imposes the necessity of transition from a multi-disciplinary to a transdisciplinary model of team work, with a clear definition of the fields of competence and the responsibility of the team members. In Bulgarian rehabilitation practice traditionally a lot of specialists are included: *medical doctors – specialists* in Neurology, Neurosurgery; Rheumatology; Orthopedics and Traumatology and in Physical and Rehabilitation Medicine (PRM); *bachelors and masters* in Physical Therapy and in Occupational therapy (Kinesio-therapy and Ergo-therapy – according nomenclature of some countries, e.g. Bulgaria and Romania).

Biography

Philosophy Doctor - scientific specialty "Physical Therapy and Rehabilitation"; thesis (2004): 'Investigation of capacities of some physical modalities in the prevention, therapy and rehabilitation of diabetic polyneuropathy patients'. Doctor of Medical Sciences - scientific specialty "Physical Therapy and Rehabilitation"; thesis (2009): 'Complex neurorehabilitation algorithms for functional recovery and amelioration of independence in activities of daily living in socially significant invalidating neurological diseases'. Philosophy Doctor - scientific specialty "Pedagogics"; thesis (2013, Sofia University): 'Innovations in the Education in the field of Rehabilitation'. SCIENTIFIC POSITIONS: Associated Professor (2006); Professor (2010); scientific specialty "Physical Therapy and Rehabilitation". High Attestation Commission at the Council of Ministers, Bg. She knows French, Spanish, English, Russian language .

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Psychometric qualities of a functional independence self-rating scale for adolescents with motor impairment

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Background: There is a shortage of a validated instrument to evaluate the effectiveness of the rehabilitation intervention by adolescents with motor impairment. The purpose of this study was to develop and evaluate its psychometric qualities of an instrument to assess functional independence that can be used by adolescents with motor impairment.

Methodology: Based on Functional Independence Measure scale (FIM) we develop a self-report multidimensional instrument, to assess the functional independence by adolescents. The final version a 16 likert-type items oriented format with, 1 (I can't), 2 (I can with much help), to 5 (I can without help). Its psychometric properties (sensitivity, reliability and validity) were evaluated among 101 adolescents with motor impairment.

Results: The final version of SSFIA 16 items (Motor Domain) psychometric qualities was assessed by Internal consistency (Cronbach's $\alpha = 0.938$, split-half

using Spearman & Brown correction $\alpha = 0.869$). Construct validity were evaluated using principal factor analysis method with varimax orthogonal rotations, revealed a tridimensional structure and explained 74.6% of the variance (elimination, self-care and transfers). We found good support for convergent (FIM scale $r_p = 0.83$ and $r_p > 0.5$ between items) and discriminant validity (average variance extracted analysis).

Conclusions: The good psychometric qualities showed clear evidence that the newly developed instrument provides a sensitive, reliable and valid tool to assess the functionality (motor domain) on adolescents with motor impairment.

Biography

Maria Isabel Dias da Costa Malheiro is an Assistant Professor at the Nursing College of Lisbon, Child and Adolescent Department. She has completed her Doctorate in Nursing at the Lisbon University, Master's in Special Education, Faculty of Human Motricity and Graduate Nurse, Specialist in Child and Pediatric Health Nursing. She has started to work in the hospital since 1988, Neonatology, Pediatrics, Child Development Center. She was the Member of the Spina Bifida Center at Garcia de Orta Hospital until 2002. Since 2002, she has joined the academic career at Nursing College of Lisbon as an Assistant Professor. She collaborates with the Spina Bifida and Hydrocephalus Portuguese Association since 2002, was Vice-President from 2005 to 2013. She was the Coordinator of the project training camp - educational program for self-management on adolescents with spina bifida/spinal cord injury 2011, 2012, 2013, 2014, 2015 and 2016.

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 Notes:

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Scientific Tracks & Abstracts Day 2

Euro Physiotherapy 2017



**Physiotherapy Techniques and Exercises /Sports &
Physiotherapy/Advancements in Physiotherapy/Manual
Physiotherapies/Rehabilitation Methods**

Session Chair
Tomasz Karski
Poland

Session Co-chair
Wael Abo El-Kheir
Egypt

Session Introduction

- Title: Novel strategies for battling obesity and reducing cardiometabolic disease risk in those with paralysis**
David R Dolbow, University of Southern Mississippi, USA
- Title: School physiotherapy program: effects on the improvement of non-specific low back pain and postures adopted in adolescents**
Beatriz Minghelli, Piaget Institute, Portugal
- Title: Thermobalancing therapy® and dr allen's devices are an excellent physiotherapy tool for treating chronic conditions that cause pain and other troubling symptoms**
Simon Allen, Fine Treatment, United kingdom
- Title: Immune responses following mckenzie lumbar spine exercise in individuals with acute low back pain: a preliminary study**
Saud Al-Obaidi, Kuwait University, Kuwait
- Title: A context-aware, multimedia, multi-modal, and language independent big data-based dyslexia screening framework with auto-grading capability**
Elham Hassanain, University of Prince Mugrin, Saudi Arabia
- Title: m-Therapy: A multi-sensor framework for in-home therapy management: A therapy of things perspective**
Mohamed Abdur Rahman, University of Prince Mugrin, Saudi Arabia
- Title: Physiotherapy project of the GP's cluster model program in hungary**
Ilona Veres-Balajti, University of Debrecen, Hungary
- Title: Mocap system for 6MW and TUG short walk tests**
Mario Sandro Da Rocha, São Paulo University, Brazil
- Title: Skeletal muscle atrophy and hypertrophy after Spinal Cord Injury**
Ashraf S Gorgey, Virginia Commonwealth University, USA
- Title: Safety & efficacy of stem cell therapy in ambulatory and non-ambulatory children with duchene muscular dystrophy**
Wael Abo El-Kheir, Military Medical Academy, Egypt
- Title: Effect of autologous mesenchymal stem cell(MSCs) injection on healing of cartilage defects: Results of preclinical and clinical studies**
Hala Gabr, Cairo University, Egypt
- Title: Self-exercise for piriformis syndrome**
Kyung-Hoon Kim, Pusan National University, South Korea
- Title: Neuro-regenerative effect of autologous mesenchymal stem cell therapy in cerebral palsy patients: Clinical trial**
Wael Abo El-Kheir, Military Medical Academy, Egypt

Novel strategies for battling obesity and reducing cardiometabolic disease risk in those with paralysis

David R Dolbow

University of Southern Mississippi, USA

The Obesity rate for individuals with SCI has been reported to be as high as 66% with a 2-3 fold increased risk of cardiometabolic diseases including heart disease, stroke and diabetes mellitus. Physical activity has been shown to be important in battling obesity and cardiometabolic disease risk, however in the SCI population, typically only the upper extremities retain voluntary muscle activity and 60-90% report shoulder pain. Thus, functional electrical stimulation lower extremities cycling (FES-LEC) has become a viable alternative for increasing physical activity levels while sparing the often over-used upper extremities. Constant cadence (FES-LEC) has been shown to provide modest improvements in increased muscle mass and decreased fat mass, especially in the lower extremities. Like-wise there is evidence of increased blood flow and enhanced arterial health in the paralyzed lower extremities. However, we have developed a resistance-guided high intensity interval FES (RG-HIIT-FES) cycling protocol that may provide equal or greater benefits with less time commitment.

Our proof-of-principle study in 3 obese persons with SCI confirmed that RG-HIIT-FES cycling 3 times per week for 8 weeks without dietary monitoring can increase legs lean mass (5-9%), increase cardiovascular health markers (58% on average) and decrease HbA1c blood levels (2-4%). Information will also be provided on preliminary results from a current follow-up study combining RG-HIIT-FES cycling and nutritional counseling on obese individuals with spinal cord injury.

Biography

David R Dolbow is currently an Assistant Professor in the School of Kinesiology at the University of Southern Mississippi. He received his bachelor and master degrees in human movement with specialization in kinesiotherapy/exercise science from Boston University, Boston, Massachusetts. He completed his PhD in Exercise Physiology/Exercise Science at Middle Tennessee State University, Murfreesboro, Tennessee and his doctorate in Physical Therapy at Belmont University, Nashville, Tennessee. He has over 30 years of clinical physical rehabilitation experience and has been a Physical Therapist Research Specialist for the past eight years. He has over 50 peer reviewed publications in scientific journals and has been a featured speaker at numerous national and international scientific meetings. His research interests include improving the quality of life in those with spinal cord injuries and other paralytic conditions through improving functional mobility and decreasing secondary morbidities such as obesity and cardiometabolic disease. Primary investigative modes of treatment include activities-based restorative therapies with lower extremities functional electrical stimulation cycling, arm ergometry and intermittent pneumatic compression being the primary focus currently. He is currently completing a funded study on electrically induced cycling and nutritional counseling for counteracting obesity after SCI.

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 Notes:

School physiotherapy program: Effects on the improvement of non-specific low back pain and postures adopted in adolescents

Beatriz Minghelli

Research in Education and Community Intervention, Brazil

Low back pain (LBP) has become a growing public health problem in adolescents, presenting a relatively high prevalence during school age. In southern Portugal, 966 adolescents were evaluated, aged between 10 and 16 years and the results revealed that 15.7% of students had LBP at the present time, 47.2% had experienced it in the last year and 62.1% had lifetime prevalence of LBP. Several factors may be involved in the pathogenesis of LBP, such as genetic, psychosocial, physiological, anthropometric and environmental, among them ethnicity, age, sex, smoking, obesity, physical activity practice, sedentary activities such as television watching and computer use, adoption of wrong postures and incorrect transportation and excess weight in school backpacks. Minghelli et al. study found that students who sit with the spine incorrectly positioned presented 2.49 (95% CI: 1.91-3.2, $p < 0.001$) greater probability of having LBP, and students using improper positions for watching TV or playing games have 2.01 (95% CI: 1.55-2.61, $p < 0.001$) greater probabilities compared to those who adopted correct postures. Physiotherapy in the school health field emerges with the objective of promoting knowledge and health conditions in this specific area of LBP and postural changes, optimizing the technical and personal skills of teachers and students, and developing individual and collective health potential. The performance of the

Physiotherapist in schools should involve a salutogenic approach in order to create in schools a stimulating environment of creativity and a critical sense, and not just an intervention aiming at changes in risk factors. Empowerment, capacity and motivation must be given so that adolescents and the entire school community are responsible for their own health choices. Several studies have verified the effectiveness of a school health program in improving students' posture and knowledge about ergonomic issues, however, there are still no guidelines and little is known about the effectiveness of such a program. The objective of this oral presentation will be to disseminate the guidelines of scientific studies that were used in school health programs and their effectiveness and to present a school health project developed in schools in the south of Portugal.

Biography

Beatriz Minghelli is an Adjunct Professor in the School of Health Jean Piaget/Algarve, Piaget Institute of Study Cycles in Physiotherapy and Nursing since 2006. She is Member of Research in Education and Community Intervention (RECI) –Piaget Institute PhD in Public Health, Epidemiology specialty, in the National School of Public Health, NOVA University Lisbon, Portugal, and Master of Science in Physical Therapy from the School of Human Kinetics, University of Lisbon, Portugal, and Physiotherapist by Education School Helena Antipoff - Rio de Janeiro, Brazil. With regard to research, she has 27 publications in national and international journals and several participations in scientific events through work in the form of poster and oral presentations. Reviewer of scientific article for several journals: Journal of Public Health, BMC Musculoskeletal Disorders, International Journal of General Medicine, Clinico Economics and outcomes research, Journal of Spine and Neurosurgery, Adolescent Health, Medicine and Therapeutics, Archives of Physiotherapy, Journal of Pain Research). She is a Member of the Editorial Board of the Journal Austin Spine, EC Orthopaedics Journal, research and reviews. Most investigations are related to epidemiology studies, including obesity, low back pain, scoliosis, postural changes, and injuries in different sports (soccer, surf, cycling and martial arts).

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 Notes:

Thermobalancing therapy® and Dr Allen's devices are an excellent physiotherapy tool for treating chronic conditions that cause pain and other troubling symptoms

Simon Allen

Fine Treatment, United Kingdom

Thermobalancing therapy and Dr Allen's Devices provide a side effects free treatment for common chronic internal disorders, such as back pain, chronic prostatitis/chronic pelvic pain syndrome (CPPS), benign prostatic hyperplasia (BPH) and kidney stones. The therapy and Dr Allen's Device received a US patent, as "Therapeutic device and method". Thermobalancing therapy is based on a new understanding of the origin of diseases that states that all chronic internal diseases have the same root, the pathological activity of capillaries. As a result of changes in small blood vessels, the focus of hypothermia becomes a continuous trigger in the affected tissue, which slowly increases the pressure in the affected organ that gradually leads to its malfunction. Dr Allen's Device applies thermolement(s), which accumulates

the body heat and becomes the source of energy itself, tightly to the skin in the projection of the affected area eliminating the focus of hypothermia and, consequently, pain and other troubling symptoms. Two clinical trials on thermobalancing therapy in men with BPH and chronic prostatitis confirmed its effectiveness. After 6 months of use of DATD: in men with BPH, there was a decrease in the prostate volume (mL) from 45.1 to 31.8 and urinary symptoms score from 14.3 to 4.7; in men with chronic prostatitis, pain reduction ranges from 10.3 to 3.5, and prostate volume (mL) from 31.7 to 27.0. There were no changes in the control groups.

Biography

Simon Allen has obtained his PhD in Medicine in 1978. For over 14 years, he has worked at and subsequently headed a hospital's Cardio-Vascular department, and treated patients with renal diseases. He had authored many scientific articles on metabolic disorders, including those linked to obesity, kidneys, arthritis, cardio-vascular and gastroenterological diseases. He has lectured Medical Doctors pursuing higher medical qualifications. He then devoted nearly two decades to further medical research into various chronic internal diseases. He has established Fine Treatment, UK, is the Author of The Origin of Diseases Theory and the inventor of effective physiotherapeutic devices which enable the Thermo balancing therapy.

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 Notes:

Immune responses following McKenzie lumbar spine exercise in individuals with acute low back pain: A preliminary study

Saud Al-Obaidi and Fadia Mahmood
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Background: The pathophysiology of low back pain (LBP) and disk-related sciatica is not limited to mechanical compression of the neural tissue. Inflammation and inflammatory mediators, has been implicated in the production of acute or chronic pain.

Objectives: This study explores the immune responses following 4 weeks of McKenzie lumbar spine exercise in individuals with acute low back pain (ALBP).

Methods: Participants were 15 volunteered patients with ALBP. Ten ml of peripheral blood were obtained from each patient before and after 4 weeks of McKenzie exercise intervention. All patients underwent subjective and objective assessment. Intervention was custom designed following McKenzie assessment and treatment protocol. For a reference purpose similar blood samples was obtained from 15 healthy individuals. Flow cytometric analysis was used to evaluate the frequencies of CD4+ T lymphocyte sub-populations and the intracellular cytokine expression within this cell population. Pain perceptions were obtained at baseline and following each week of exercise sessions.

Results: There was no significant difference in the frequency of T lymphocyte sub-populations; memory

(CD4+CD45RO+) T cells, helper inducer (CD4+CD29+) T cells, CD3+CD16+CD56+ T cells and naive/suppressor (CD4+CD45RA+) T cells at base line relative to these cell populations after exercise sessions. Pain was significantly reduced after 4 weeks of McKenzie exercise interventions ($p < 0.05$). The percentage of T cells expressing pro inflammatory cytokines IL-8 and TNF- α and anti-inflammatory cytokine IL-4 increased significantly ($p < 0.05$) following intervention. Interestingly, the reduction in pain scores did not correlate with elevated anti-inflammatory cytokines.

Conclusion: McKenzie exercise induced an immune activation state and simultaneously up regulated anti-inflammatory IL-4 cytokines that boost pain relief.

Biography

Prof. Saud received his Master degree in Physical Therapy from Washington University at Saint Louis Missouri in 1987, and his Ph.D. from New York University in 1991. Prof. Saud have over 30 years of clinical experience, in clinical management of pain and musculoskeletal conditions and the subsequent movement dysfunction. Professor Saud research areas include analysis of abnormal movement management of acute and chronic pain and dysfunction, focusing on the consequences of selected biopsychosocial factors including; anticipation and fear of pain, exaggerated pain perception, pain avoidance behavior, and related impact on physical performances. Recently he got interested in immune responses following low intensity exercise performances on pain modulation and immune process. Prof. Saud have published many articles in prestigious international journal and served as a reviewer for many local and international journal including ; Journal of Physical Therapy Theory and Practice, Annals of Human Biology, Physiotherapy Research International, Clinics and Practice, International Journal of General Medicine, Kuwait Medical Journal, and Saudi Medical Journal. Professor Saud have developed and patented 2 devices in his field of practice. Since 2007 Professor Saud works as the Dean of Faculty of Allied Health Sciences, at Kuwait university.

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 Notes:

A context-aware, multimedia, multi-modal, and language independent big data-based dyslexia screening framework with auto-grading capability

Elham Hassanain and Madinah Al Munawwarah
University of Prince Muqrin, Saudi Arabia

In this talk, we will present a tablet-based big data multimedia environment, which uses text, audio, video, and gaze movement to detect a set of symptoms of having dyslexia. Multi-modal, language-independent screening test modules have been developed, which gives indications of further dyslexia diagnosis necessity. The multimedia retrieval framework is envisioned to accelerate and ease

the process of testing dyslexia at the global level, and to identify and auto assess potential dyslexic patterns and to accumulate huge collection of multimedia test data for in-depth clinical dyslexia pattern analysis.

Biography

Elham Hassanain is an Assistant Professor in the Department of Forensic Computing and Cyber Security, University of Prince Muqrin (UPM), Madinah Al Munawwarah, Kingdom of Saudi Arabia. She served as the Vice Dean of College of Computer and Information Systems at Umm Al-Qura University. She also served as a Member of Saudi Parliament for duration of four years. Currently she is the Deputy Rector for Academic Affairs of University of Prince Muqrin. Her research interests include e-Health, cloud and multimedia for healthcare, IoT, and smart city. She has publications in refereed IEEE/ACM journals and conferences. Recently, she has been awarded 1 US patent on vision therapy. She has served as a Member of the organizing and technical committees of several workshops.

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 Notes:

M-therapy: a multi-sensor framework for in-home therapy management: A therapy of things perspective

Mohamed Abdur Rahman and Madinah Al Munawwarah
University of Prince Muqrin, Saudi Arabia

Internet of Things (IoT) is assumed to provide e-Health services by incorporating social networks and the IoT. Although much development in therapy monitoring has been observed recently, little advancement has been achieved in the domain of in-home therapy. Existing industrial and medical solutions require complex and expensive hardware and software that are impractical for home use. Another challenge for in-home therapy is that therapists cannot confirm whether patients are conducting the therapy correctly and for the prescribed number of times. To address these challenges, we propose the m-Therapy framework, in which multiple gesture-tracking sensors and environmental sensors are used to collect therapy and ambient data. The m-Therapy framework compresses the collected data and uploads to a big data server. The framework uses a model of the therapy to guide a patient performing therapy exercises outside medical institutions and even at home. Ambient IoT sensors can help maintain an appropriate ambient environment, which

is generally maintained at the medical institutions. We have developed analytics that can provide live or statistical kinematic data, including rotational and angular range of motion of the joints of interest, and ambient environmental data, which can be shared with therapists and caregivers. We present our findings which show that the proposed m-Therapy monitoring system can be deployed in real-life scenarios.

Biography

Mohamed Abdur Rahman is an Assistant Professor in the Department of Computer Science, University of Prince Muqrin (UPM), Madinah Al Munawwarah, and Kingdom of Saudi Arabia. He is currently working as the Chairman in Forensic Computing and Cyber Security (FCCS) Departments of UPM. He received his Masters and PhD degrees in Electrical and Computer Engineering from the University of Ottawa, Canada in 2005 and 2010 respectively. His research interests include serious games, cloud and multimedia for healthcare, IoT, smart city, secure systems, multimedia big data, and next generation media. He has authored and co-authored around 98 publications including refereed IEEE/ACM/Springer/Elsevier journals, conference papers, and book chapters. He has seven US patents on Physio Therapy and more than 20 are pending. He has received more than 12 million SAR as research grant. He is the founding Director of Advanced Media Laboratory. He has presented his works in more than 20 different ACM and IEEE International Conferences. He has served as a Member of the organizing and technical committees of several international conferences and workshops. Recently, he received three best paper awards from ACM and IEEE conferences. He is a Member of both IEEE and ACM.

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 Notes:

Physiotherapy project of the GP's cluster model program in Hungary

Ilona Balajti
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The provision of health promoting services is included in the competences of physiotherapists in addition to rehabilitative tasks provided in specialized care. Therefore, physiotherapists integrated seamlessly into the Primary Care Development Model Programme. Physiotherapeutic services in the GP clusters were implemented at different levels of prevention, and in all clusters included programmes such as spinal training, improvement of motility and endurance, treatment of various problems of the musculoskeletal system, and exercise programs for weight loss. Efficiency of the physiotherapy services was supported by surveys on health status and quality of life as well as physical status examinations yielding significantly improved results. A patient satisfaction survey conducted among participants of physiotherapeutic interventions showed that over 90% of the clients were satisfied with these types of services.

Recent Publications:

1. Balajti I, Vokó Z, Ádány R and Kósa K (2007) A koherencia-erzes meresere szolgáló rövidített kérd?ív es a lelki egészség (GHQ-12) kérd?ív magyar nyelv? változatainak validálása. *Mentálhigiene es Pszichoszomatika*. 2:147-161.
2. Bíró E, Balajti I, Ádány R, Kósa K: Determinants of mental wellbeing of medical students. *Social Psychiatry and Psychiatric Epidemiology*. 45 (2):

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3. I Balajti, L Daragó, R Ádány, K Kósa (2010) College students' response rate to an incentivized combination of postal and web-based health survey. *Evaluation & the Health Professions*. 33 (2): 164-176.
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5. Bíró E, Veres-Balajti I, Ádány R, Kósa K (2014) Social cognitive intervention reduces stress in Hungarian university students. *Health promotion international X*. 1-7.

Biography

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Notes:

Mocap system for 6MW and TUG short walk tests

Mário Sandro F da Rocha, A A de Oliveira and F M Bersotti
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Precise measurements of spatial orientation place an important role in human movement analysis. In this work we present a new inertial motion capture system (Mocap) with an interface designed for physical therapist or physiotherapist, or more specifically, for the six-minute walk (6MW) and timed-up-and-go (TUG) short walk tests, which are among the most largely used by physical therapists or physiotherapists as assessment tools for physical function and clinical performance. It will be shown a quick overview about the main Mocap technologies, why

our inertial system can be one critical tool to get accurate data on what the bodies are doing, and how it would be useful in physiotherapy; Financial Suporte: FAPESP.

Biography

Mário Sandro F da Rocha received his BSc, MSc and PhD in Physics from São Paulo University in 1987, 1996 and 2001 respectively. From 2001 to 2004 he worked as a Postdoctoral Researcher in the Dosimetry Laboratory at Institute of Physics of São Paulo University. From 2005 to 2007 he was a Fellowship Researcher in display technologies at CTI Renato Archer, Campinas, SP, where up to 2015 developed several projects in the areas of ICT and motion capture using infrared cameras. In 2016, he started developing a project of a inertial motion capture system for applications in physiotherapy, which was selected to get the financial support of the public foundation FAPESP, funded by taxpayers in the state of São Paulo. Currently, he is one of the partners of the company Mocap Brazil.

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 Notes:

Skeletal muscle atrophy and hypertrophy after spinal cord injury

Ashraf S Gorgey

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Skeletal muscle atrophy is one of the most prominent changes to occur post spinal cord injury (SCI), with thigh muscle cross-sectional area being up to 30–50% smaller than that of able-bodied controls few weeks after injury. Skeletal muscle atrophy has dramatic effects, especially after motor complete SCI (i.e. no voluntary movement below the level of injury) on several health parameters. These parameters may include bone, metabolic and cardiovascular health and may lead to secondary health complications similar to obesity, type II diabetes and cardiovascular disease. Therefore, an effective rehabilitation approach is essential to attenuate the process of skeletal muscle atrophy and the rapid decline in lean mass after SCI. Neuromuscular electrical stimulation (NMES)-resistance training (RT) has been shown to be an effective rehabilitation strategy for producing muscle hypertrophy and decreasing fat in individuals with SCI. The training process involves progressively loading the strained muscle in a gradual fashion to carry on weights for 12-16 weeks. We have demonstrated that person with motor complete SCI

can lift ~26 lbs. without any noticeable adverse events. Enhancing the development of metabolically active lean muscle mass has the potential to enhance, basal metabolic rate, glucose homeostasis and improve lipid profile following SCI. We will demonstrate recent evidence that highlights the significance of restoring and maintaining lean mass on mitochondrial health, visceral fat as well as metabolic health after SCI. We believe that a multi-disciplinary approach of combining NMES-RT and dietary interventions can optimize cardiometabolic outcomes after SCI.

Biography

Ashraf S Gorgey is currently the Director of Spinal Cord Injury Research at Hunter Holmes McGuire at VA Medical Center and Associate Professor at Department of Physical Medicine and Rehabilitation, Virginia Commonwealth University. He has a Bachelor and Master degrees in Physical Therapy. He acquired his PhD in Exercise Physiology in 2005 with special emphasis on electrical stimulation, muscle activation and fatigue from the University of Georgia. He completed a postdoctoral fellowship at the University of Michigan with special focus on studying the adaptations in body composition and metabolic profile after SCI. His research background is in Rehabilitation and Exercise Physiology with special interest in individuals with SCI. His research work has focused on investigating rehabilitation strategies that could improve the quality of life in individuals with SCI and minimize the SCI health related secondary complications. He is primarily interested in applications of electrical stimulation and the capability of utilizing exercise intervention to evoke skeletal muscle hypertrophy, favorable body composition and metabolic profiles in persons with chronic SCI. He is also interested in understanding the cellular and molecular adaptations to unloading and hypertrophy.

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 Notes:

Safety and efficacy of stem cell therapy in ambulatory and non-ambulatory children with duchene muscular dystrophy

Wael Abo El-Kheir¹, Osama Ghannam², Esey El-Fiki³ and Hala Gabr⁴

¹Military Medical Academy, Egypt

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³Alexandria University, Egypt

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Duchenne muscular dystrophy (DMD) is the most common muscular dystrophy of childhood. This incurable disease is characterized by muscle wasting and loss of walking ability leading to complete wheelchair dependence by 13 years of age. Prolongation of walking is one of the major aims of treatment. This study is to investigate the effects of allogenic mesenchymal stem cell therapy in ambulatory and children with Duchene Muscular Dystrophy and determine its suitability as a form of treatment. This study was conducted on 35 myopathic children 12 ambulatory, 10 non-ambulatory and 13 control (seven ambulatory and six on-ambulatory) aged from 4-14 years. The control groups taken the traditional

treatment (physiotherapy and medical treatment drugs) and the studied groups taken the same treatment with allogenic bone marrow mesenchymal stem cells intramuscular and systemic IV. Assessment was done by North Star ambulatory assessment CHAQ (Child Health Assessment Questionnaire) MRI/MRS Muscle Strength Assessment -Myogrip, Myopinch, and Moviplate, manual muscle strength testing using Medical Research Council strength scores, functional outcome measures before and after every three months for two years long and adverse effect and complications inspected. There were significant differences in assessment scores and quality of life questionnaire between studied groups vs. control group. There was minimal adverse effect and complications.

Biography

Wael Abo El-Kheir is currently works as Professor of immunology & Microbiology in military medical academy and he is the member of

the national committee for stem cells Egyptian ministry of health and also honor as secretary of the Egyptian society of stem cells.

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 Notes:

Effect of autologous mesenchymal stem cell (MSCs) injection on healing of cartilage defects: Results of preclinical and clinical studies

Hala Gabr¹ and Wael Abo El-Kheir²

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Chondrogenesis is a well-orchestrated process derived by chondroprogenitors that undergo to condensation, proliferation and chondrocyte differentiation. Because cartilage lacks blood supply, it lacks regenerative power and subsequent wound healing. Cartilage degeneration caused by congenital anomalies, disease or trauma is of great clinical consequence as it leads to incomplete attempts of repair by local chondrocytes. The end stage of cartilage damage frequently leads to O A resulting in a significant decrease in the quality of life of millions of people. Treatment methodologies varied from pharmaceutical, nutraceutical, gene therapy, molecular engineering; in addition to tissue engineering (TE) also known as “cell therapy”. In vitro, MSCs showed the potential to differentiate and can be multiplied without losing their multilineage capacity of differentiation. This made the MSCs the cell of choice in tissue engineering. MSCs are multiline age progenitor cells and responsible for the turnover and repair of mesenchymal tissues, such as bone, cartilage, ligament, muscle, and fat. Although no clear definitive phenotype of MSCs has been described, through the use of the proper culture conditions, expanded

MSCs can be stimulated to differentiate along specific pathways, such as chondrogenesis, adipogenesis, and osteogenesis. The objective of this work was to confirm the fitness of the dog as a good model of OA; effect of cell therapy in cases of acute and chronic, compared to control group surgically induced partial thickness chondral defects through the injection of autologous bone marrow derived MSCs in dogs. This work was done on 24 knees of male domestic mongrel dogs by doing surgical chondral defects then injected intra-articular with MSCs according to classified groups: acute (injected after 1 day), chronic (after 1 month) and control group not injected. The dogs sacrificed after 1,2,6,8 weeks of injection. Assessment by histological scoring of cartilage repair (OsScore) for blind randomized samples and by clinical examination for lameness degree score. Our results showed that dogs possess characteristics that are not found in traditional rodent models and confirmed the efficacy of direct intraarticular injection of MSCs to home and function in cartilage defects both in acute and chronic lesions. The local delivery of MSC is a good therapeutic option for O A.

Biography

Hala Gabr is a renowned Researcher in Stem Cell Biology and Therapy in Cairo University, Egypt. She is the Director of the Pediatric Bone Marrow Transplantation and Cellular Therapy Lab in Cairo University. She is the Co-Founder of the Egyptian Society for Progenitor Stem Cell Research, the leading stem cell research body in Egypt. She has published more than 30 papers in reputed journals and is an Editorial Board Member of a number of reputed journals. She has supervised nearly a hundred PhD and master thesis in stem cell research.

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 Notes:

Self-exercise for piriformis syndrome

Kyung-Hoon Kim

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Introduction: Piriformis syndrome (PS) is defined as excessive and prolonged contraction of the piriformis muscle (PM), which produces low back and lower leg pain. Diagnosis of PS is confirmed by conversion from a positive to negative flexion-adduction-internal rotation (FAIR) test after a diagnostic injection into the PM, while both the straight leg raise and the Lasègue tests are negative. Intractable PS is treated by an injection of 50-100mg of botulinum toxin into the affected muscle under the fluoroscope or ultrasound, and a perform-at-home self-exercise program for piriformis muscle stretching. The action of injected botulinum begins slowly and reaches the tolerable pain level after 2-3 months, and ends the relaxation effect at around 6 months. This study was performed to evaluate the efficacy of piriformis exercise in patients who received botulinum toxin into the affected muscle.

Methods: 500 patients who received botulinum toxin into the affected muscle divided into 2 groups, piriformis exercise group and control group. The piriformis exercise begins with a push-up position using hands and toes (A), followed by placing the affected leg across and underneath

the body trunk so that, if possible, the affected knee is outside the trunk (B). The unaffected leg is extended straight back behind the trunk, keeping the pelvis straight (C). The hips are moved backward toward the floor; the body is leaned forward with the forearms toward the floor; the affected leg is kept in place, until a deep stretch is felt (D). The stretch is held for 30 s, and then the patient slowly returns to starting position. The self-exercise program requires the patient to assume a certain position 20 times a day. This study was excluded the patients who could not perform self-exercise due to old age and previous lower leg operation. Re-injection rate after recurrence of piriformis syndrome was compared between 2 groups.

Results: PS was more frequent in male (M/F=370/130). Mean age was 58.5 ± 10.3 years. Re-injection rate within 1 year after the first injection was significantly reduced in the piriformis exercise group (P group/C group=15%/35%).

Conclusions: A self-exercise program reduces and prevents the recurrence of PS within the 1-year-study period.

Biography

Kyung-Hoon Kim is currently work in pain clinic. He is from Pusan National University Yangsan Hospital, Bumeuri, Mulgeumup, Yangsan, Kyungsangnamdo, Korea.

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 Notes:

Neuro-regenerative effect of autologous mesenchymal stem cell therapy in cerebral palsy patients: Clinical trial

Wael Abo El-Kheir¹, Osama Ghannam², Esey El-Fiki³ and Hala Gabr⁴

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Background: Stem cell-based therapies provide hope for various CNS diseases including perinatal hypoxic ischemic insults of the brain. Stem cells have the capacity to proliferate in culture, migrate and disseminate following implantation within the adult CNS. The neuroregenerative potential of bone marrow-derived mesenchymal stem cells (MSCs) is proposed to be through paracrine effect, stimulation of endogenous stem cells, angiogenesis, in addition to the disputed possibility of direct trans differentiation.

Objectives: To study the impact of MSC transplantation on psychomotor functions in patients with cerebral palsy.

Methods: Fifty two Egyptian patients with cerebral palsy were divided into: group I (26 patients who underwent

autologous intrathecal bone marrow-derived mesenchymal stem cell injection) and group II (26 patients who served as control). Both groups were assessed, initially and after one year, by a group of clinical scales to assess motor, communication and independence skills.

Results: In group I, using Boyd's developmental progress scale revealed a statistically highly significant improvement in motor, independence and communication skills after SCT (P value<0.01). Also, 100 points scale revealed a statistically significant improvement after SCT (P value<0.05).

Conclusion: Autologous stem cell transplantation could be a useful tool for the management of patients with cerebral palsy as it may help in improvement of motor, independence and communication skills.

Biography

Wael Abo El-Kheir is currently works as Professor of immunology & Microbiology in military medical academy and he is the member of the national committee for stem cells Egyptian ministry of health and also honor as secretary of the Egyptian society of stem cells.

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 Notes:

Autologous bone marrow-derived cell therapy combined with physical therapy induces functional improvement in chronic spinal cord injury patients

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Spinal cord injuries (SCI) cause sensory loss and motor paralysis and are treated with physical therapy, but most patients fail to recover due to limited neural regeneration. Here we describe a strategy in which treatment with autologous adherent bone marrow cells is combined with physical therapy to improve motor and sensory functions in early-stage chronic SCI patients. In a phase I/II controlled single-blind clinical trial (clinicaltrials.gov identifier: NCT00816803), 70 chronic cervical and thoracic SCI patients with injury durations of at least 6 months were treated with either intrathecal injection(s) of autologous adherent bone marrow cells combined with physical therapy, or with physical therapy alone.

Patients were evaluated with clinical examinations, electrophysiological somatosensory evoked potential, MRI imaging, and functional independence measurements. Chronic cervical and thoracic SCI patients treated with autologous adherent bone marrow cells combined with physical therapy showed functional improvements over patients in the control group treated with physical therapy alone, and there were no cell therapy-related side effects. At 18 months posttreatment, 23 of the 50 cell therapy-treated cases (46 percent) showed sustained improvement using the American Spinal Injury Association (ASIA) Impairment Scale (AIS). Compared to those patients with cervical injuries, a higher rate of functional improvement was achieved in thoracic SCI patients with shorter durations of injury and smaller cord lesions. Therefore, when combined with physical therapy, autologous adherent bone marrow cell therapy appears to be a safe and promising therapy for patients with chronic spinal cord injuries. Randomized controlled multicenter trials are warranted.

Biography

Wael Abo El-Kheir is currently works as Professor of immunology & Microbiology in military medical academy and he is the member of

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Rehabilitation of obstructed defecation: Techniques and treatment outcomes

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Obstructed defecation is broadly defined as the inability to evacuate contents from the rectum, with symptoms of a subjective sensation of anal blockage during defecation. It is a subset of constipation, in that it differs from slow-transit constipation in terms of pathophysiology, due to outlet pelvic obstruction with anorectal dysmotility. Outlet obstruction may be caused by organic or functional diseases: disorders of rectal sensation and pelvic floor dyssynergia are the main etiologic functional factors. The treatment of functional diseases is rehabilitative and multimodal rehabilitation guided by anorectal manometry is a useful method for managing the pathophysiology

of obstructed defecation. The mean length of the rehabilitation cycle is about five months. The overall mean Obstructed Defecation Syndrome score shows significant improvement after rehabilitative treatment, using two, three or four rehabilitative techniques (pelvipерineal kinesitherapy, biofeedback, anal electro stimulation, rectal sensory retraining). Therefore, multimodal rehabilitation of obstructed defecation provides the opportunity to improve the severity of symptoms in many patients. Moreover, multimodal rehabilitation identifies those 'nonresponders' who should be next in line for more expensive and invasive therapeutic procedures (sacral neuromodulation or surgery).

Biography

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