

Ita. J. Sports Reh. Po.

Italian Journal of
Sports Rehabilitation and Posturology

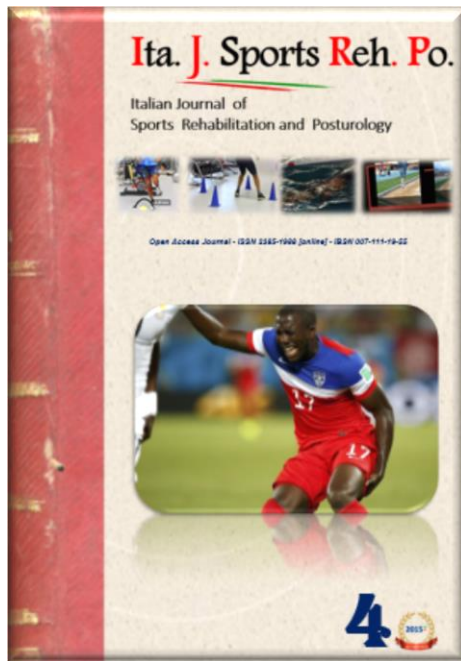


Open Access Journal - ISSN 2385-1988 [online] - IBSN 007-111-19-55



4





Editor in Chief : *Rosario D'Onofrio*
 Volume : 2/2015
 Issue : 4
 Page : 342 - 441
 Years : 2
 Publication Start Year : 2014
 Country of Publication: *Italy*
 Title Abbreviation: *Ita J Sports Reh Po*
 Language : *Italian/ English*
 Publication Type(s) : *No Periodical*
 Access Journal : Free (Only Members)
 Digital Identifier : Digital Object Identifier System (DOI)
 ISSN : 2385-1988 [Online]
 IBSN : 007-111-19-55
 ISI Impact Factor: *None*
 Index : Open Academic Journals Index (OAJI)
 Website : www.italianjournalsportsrehabilitation.com
 Info : info@italianjournalsportsrehabilitation.com



Cari Colleghi, Cari Lettori

Accolgo con molto piacere, l'invito dell'Editor di scrivere questa prefazione al numero 4 dell'Italian Journal of Sports Rehabilitation and Posturology.

Devo affermare come con la conclusione dei campionati di calcio arriva, come sempre, per noi Medici del calcio, il momento di fare un bilancio, Clinico, con particolare attenzione al quadro epidemiologico degli infortuni riscontrati in questa stagione sportiva 2014-2015, nel campionato Italiano. Osservando i dati statistici, non si può certo affermare che sia stata una stagione "vincente", in quanto caratterizzata da troppi infortuni. Questi confermano, però, il trend degli ultimi anni. Tuttavia rimandando ad un altro

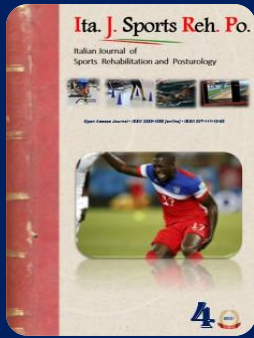
momento e ad altra sede, l'analisi clinico/epidemiologica magari al prossimo Congresso L.A.M.I.C.A. quello che ha suscitato, in me una riflessione è la diatriba tra l'allenatore del Bayer Monaco, Pep Guardiola e il medico della squadra, quel Prof. Muller-Wohlfahrt, oggi, considerato una Evidenza Scientifica in Germania . All'indomani della sconfitta contro il Porto, il Prof. Prof. Muller-Wohlfahrt è stato tacciato di essere il principale responsabile dei risultati negativi della Squadra Tedesca. La risposta a questa accusa ,sono state, da grande professionista e uomo di scienza, le immediate dimissioni del Prof. Muller-Wohlfahrt e del suo Staff. Con stupore ho constatato come questa notizia sia scivolata via, silenziosamente, senza provocare quei simpatici dibattiti e tavole rotonde che pure non mancano nel mondo del calcio. Così che la mente mi ha riportato agli anni 80/90 ad un articolo pubblicato su "Stampa Sera" dal giornalista Pier Carlo Alfonsetti che in sostanza definiva i medici: le ultime "ruote del calcio". Sono trascorsi molti anni, il calcio è cambiato molto, evolvendosi sia dal punto di vista tecnico che di business, ma ahime' per quanto riguarda la figura del medico sociale le problematiche sono rimaste identiche, assumendo forse solo una dimensione più ... Europea. !? Chiudo questa mia riflessione riportando la notizia della promozione del Teramo Calcio nella serie B. Al di là dell'impresa sportiva della squadra, che pure merita di essere sottolineata essendo la prima volta che si affacciano al campionato cadetto, la mia soddisfazione sta nel fatto che lo stadio di calcio del Teramo è l'unico stadio, nel calcio professionistico, intitolato alla memoria del suo Medico Sociale "Dott. Gaetano Bonolis" che per tanti anni è stato Segretario e figura di riferimento per tutti noi della L.A.M.I.C.A. Quindi complimenti ed un augurio al Teramo Calcio.

Nel salutarvi vi auguro Buone Vacanze

Dr. Pasquale Tamburrino

Segretario L.A.M.I.C.A.





Ita. J. Sports Reh. Po.

Italian Journal of
Sports Rehabilitation and Posturology

Table of Contents

Ita. J. Sports Reh. Po. 2015 ; Vol. 2 ; 4 ; 342 - 441

Editorial

Joseph A. Giandonato, Victor M. Tringali

Making the Case for Exercise and Fitness Professionals Leading Wellness Programs.

Ita J Sports Reh Po 2015 ; 2 ; 4 ; 342 - 344 ; doi : 10.17385/ItaJSRP.015.3006

ISSN 2385-1988 [online] - IBSN 007-111-19-55

Articles

Rosario D'Onofrio, Stefano Bruno

Indagine Epidemiologica delle Lesioni Muscolari nel Calcio. Analisi Retroattiva delle Letteratura .

Ita J Sports Reh Po 2015; 2; 4 ; 345 - 367 ; doi : 10.17385/ItaJSRP.015.3007

ISSN 2385-1988 [online] - IBSN 007-111-19-55

Nikos Apostolopoulos, George S. Metsios Jack Taunton , Yiannis Koutedakis , Matthew Wyon

Acute Inflammation Response to Stretching : a Randomised Trial.

Ita J Sports Reh Po 2015; 2; 4 ; 368 - 381 ; doi : 10.17385/ItaJSRP.015.3008

ISSN 2385-1988 [online] - IBSN 007-111-19-55

Francis Osei, Rosario D'Onofrio, M. Omoniyi Moses

Kibler's Test as a Functional Pre-Physical Examination Asymmetries of the Scapula in Overhead Game Athletes. A Field Test.

Ita J Sports Reh Po 2015; 2; 4 ; 382 - 396 ; doi : 10.17385/ItaJSRP.015.3009

ISSN 2385-1988 [online] - IBSN 007-111-19-55

Massimo Armeni, Claudio Civitillo

Osteopathic Manipulative Treatment combined with Body Composition Analysis and Caloric Balance improves Pain and Performance in an Amateur Cyclist suffering from Chronic Neck-Pain. A Case-Report.

Ita J Sports Reh Po 2015; 2; 4 ; 397 - 405 ; doi : 10.17385/ItaJSRP.015.3010

ISSN 2385-1988 [online] - IBSN 007-111-19-55

Brief Communications

Pasquale Tamburrino, Rosario D'Onofrio , Agostino Tucciarone

Ankle Sprains in Professional Soccer Players. Isokinetic Strenght of Evertors and Invertors Muscles after Ankle Sprains Treated With Two Different Dynamic Protection .

Ita J Sports Reh Po 2015 ; 2 ; 4 ; 406 - 412 ; doi : 10.17385/ItaJSRP.015.3011

ISSN 2385-1988 [online] - IBSN 007-111-19-55

Milan Nilendra Perera

Assessment of Osgood Disease among Teenager Footballers in Negombo, Srilanka.

Ita J Sports Reh Po 2015; 2; 4 ; 413 - 419; doi :10.17385/ItaJSRP.015.3012

ISSN 2385-1988 [online] - IBSN 007-111-19-55

Robert Flowers

Sacral Stress Fracture in an Adolescent Dancer.

Ita J Sports Reh Po 2015 ; 2 ; 4 ; 420 - 428; doi : 10.17385/ItaJSRP.015.3013

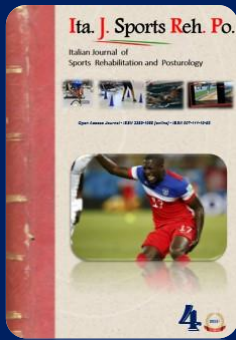
ISSN 2385-1988 [online] - IBSN 007-111-19-55

Joseph A. Giandonato, Victor M. Tringali, Christopher D. Policastro

Evaluative Analysis of Interventive and Preventative Physical Activity Initiatives within Occupational Environments.

Ita J Sports Reh Po 2015 ; 2 ; 4 ; 429 - 441; doi : 10.17385/ItaJSRP.015.3014

ISSN 2385-1988 [online] - IBSN 007-111-19-55



Ita. J. Sports Reh. Po.

Italian Journal of
Sports Rehabilitation and Posturology

Abstract

Ita. J. Sports Reh. Po. 2015 ; Vol. 2 ; 4 ; 342 - 412

Abstract



R. D'Onofrio, S. Bruno - **Indagine epidemiologica delle lesioni muscolari nel calcio. Analisi retroattiva delle letterature** . ; Ita J Sports Reh Po 2015; 2; 4 ; 345- 367 ; doi : 10.17385/ItaJSRP.015.3007 ; ISSN 2385-1988 [online] ; IBSN 007-111-19-55



Il calcio è considerato lo sport più popolare del mondo essendo praticato da almeno 200 milioni di atleti e da 21 milioni di calciatrici, registrate alla Fédération Internationale de Football Association (FIFA). Gli eventi lesivi sono un evento avverso, importante, spesso estremamente invalidante, per la carriera di un giocatore di calcio. Le lesioni muscolari sono molto comuni nel calcio, che rappresentano fino al 37% di tutte le lesioni per assenza dall'attività agonistica. I risultati delle ricerche sulle evidenze scientifiche evidenziate nella letteratura dipendono dal concetto di definizione della lesione, dalle caratteristiche dei giocatori e dall'obbiettivo della ricerca¹⁶. I problemi metodologici associati alla ricerca delle lesioni sportive sono stati descritti ed evidenziati da Finch,⁵⁸ Dvorak^{59,60} e da Noyes.⁶¹ Studi epidemiologici, internazionali, sui giocatori di calcio, hanno identificato un livello di incidenza delle lesioni pari al 10-35 per 1000 ore di gioco.⁶⁴ La maggior parte delle lesioni si verificano all'arto inferiore, in particolare il 61.2% a carico del ginocchio e della caviglia². Oltre 1/4 degli infortuni nel calcio sono rappresentati da lesioni muscolo scheletriche, principalmente localizzate nel quadricipite (14%), nei muscoli ischio-crurali (28%) e negli adduttori (8%).^{3,4} Asymmetries/dysbalances" nel rapporto funzionale quadricipite/ischio crurali dimostrano un significativo impatto sull'incidenza delle lesioni. La prevenzione e riabilitazione delle lesioni degli ischio crurali dovrebbe essere parte di un approccio, interdisciplinare, sistematico basato sulle evidenze proposte e validate dalla letteratura scientifica.

Italian Journal of Sports Rehabilitation and Posturology

Abstract



N. Apostolopoulos, G. S. Metsios, J. Taunton, Y. Koutedakis, and M. Wyon - **Acute Inflammation Response to Stretching : a Randomised Trial.** ; Ita J Sports Reh Po 2015; 2; 4 ; 368 - 381 ;doi 10.17385/ItaJSRP.015.3008 ISSN 2385-1988 [online] ; IBSN 007-111-19-55

Background: The aim of the study was to examine the effects of an intense stretch on selected serum-based muscle inflammation biomarkers. **Methods:** A randomised within-subject crossover trial was conducted with 12 healthy recreationally active males (age: 29±4.33yrs, mass: 79.3±8.78kg, height: 1.76±0.06m) participating in both an intense stretching and control intervention. During the stretch intervention the hamstrings, gluteals and quadriceps were exposed to an intense stretch by the same therapist, in order to standardise the stretch intensity for all participants. The stretch was maintained at a level rated as discomfort and/or mild pain with use of a numerical rating scale (NRS). Each muscle group was stretched for 3 x 60 seconds for both sides of the body equating to a total of 18 minutes. During the control intervention, participants rested for an equivalent amount of time. A 5ml blood sample was collected pre-, immediately post, and at 24h post for both conditions to assess the levels of interleukin (IL)-6, interleukin (IL)-18, tumour necrosis factor (TNF)-α, and high sensitivity C-reactive protein (hsCRP). Participants provided information about their level of muscle soreness 24, 48, and 72h post treatment, using a numeric rating scale. **Results:** hsCRP increased significantly at 24h compared to control and immediate post stretch intervention, for time (p=0.005), and time x condition (p=0.006). No significance was observed for IL-6, IL-18 or TNF-α (p>0.05). **Conclusion:** It is observed that intense stretching may lead to an acute inflammatory response supported by the significant increase in hsCRP.

Abstract



F. Osei, R. D'Onofrio and M. Omoniyi Moses - **Kibler's Test as a Functional Pre-Physical Examination Asymmetries of the Scapula in Overhead Game Athletes . A Field Test.** ; Ita J Sports Reh Po 2015; 2; 4 ; 382 - 396 ; doi : 10.17385/ItaJSRP.015.3009 ; ISSN 2385-1988 [online] ; IBSN 007-111-19-55



Analysis and study of the posture of athlete is one of the most important aspects of evaluation during pre-season. In overhead athletes, assessing the functionality of the scapula is one of the most important and interesting observations in postural manner. Postural asymmetries frequently remains as dysfunctional abnormalities that correlate with increase in risk factors for disease in the shoulder of athletes who involv ein overhead sports. These asymmetries scapular posture are more pronounced in the upper limbs dominant for their repetitiveness gestural in game play. Test of static and dynamic evaluation have been presented in the literature to classify the presence of dyskinesia'sscapular between the Kibler's test (lateral scapular slide test, LSST) that evaluates the postural modulation of the scapula in static positions clinically. Through this test, asymmetries side to side above the measurement of 1.5 cm may be classifiable as scapular dyskinesia after fifteen minutes of assessment on the field. We therefore recommend LSST to overhead game (volleyball) athletes' technical teams as a functional assessment field test for scapula. It is simple within 15 seconds, repeatable and capable of detecting any scapular dysfunction in asymptomatic volleyball athletes.



Abstract



M. Armeni, C. Civitillo - **Osteopathic Manipulative Treatment combined with Body Composition Analysis and Caloric Balance improves Pain and Performance in an Amateur Cyclist suffering from Chronic Neck-Pain. A Case-Report.** ; Ita J Sports Reh Po 2015; 2; 4 ; 397 - 405 ; doi : 10.17385/ItaJSRP.015.3010 ISSN 2385-1988 [online] ; IBSN 007-111-19-55



Introduction: *This Case-Report analyses the potential efficacy of the Osteopathic Manipulative Treatment (OMT) combined with caloric balance in an amateur cyclist, both in relation to pain onset and perception, and performance enhancement. Following an accurate analysis of the literature through the main biomedical data banks, the authors did not find previous studies focusing on these specific parameters in the case of amateur cyclists.* **Case description:** *This case is about Mr. M. M., an amateur cyclist with chronic Neck-Pain, severe anxiety, overweight, low energy and poor performance. The authors carried out an osteopathic evaluation together with a multi-compartmental body composition analysis and caloric balance, and administered specific measuring scales. The primary composite outcome was identified by the Rate of Perceived Exertion (BORG/RPE) and the Visual Analogue Scale (VAS). The Hamilton Anxiety Rating (HAMg-A) and Post-Race Heart Rate reduction identified the secondary outcomes.* **Results:** *After 4 test-based OMT sessions and the adjustment of the daily calorie intake, at 60 day follow-up, the subject did not show any cervical pain; anxiety was significantly reduced, the body composition analysis showed a significant decrease of fat mass and performance improved significantly.* **Conclusions:** *This Case-Report shows that continuous benefits can be obtained with a multifactorial approach, both in amateur and professional athletes. The authors hope that the originality of this study might stimulate other researchers to focus on these issues with a larger cohort.*

Abstract



P. Tamburrino, R. D'Onofrio, A. Tucciarone - **Ankle Sprains in Professional Soccer Players. Isokinetic Strength of Evertors and Invertors Muscles after Ankle Sprains Treated With Two Different Dynamic Protection.** Ita J Sports Reh Po 2015 ; 2 ; 4 ; 406 - 412 ; doi : 10.17385/ItaJSRP.015.3011 ; ISSN 2385-1988 [online] ; IBSN 007-111-19-55



Purpose: The aim of this study was to investigate the effects of two forms of immobilization in ankle sprains on the strength of evertor and invertor muscles, in order to draw up a rational training plan, designed to speed up the athlete's return to competitive sport. **Methods:** A total of 18 soccer players (average height 1.76 ± 0.05 - average age 24.5 ± 3.5 - average weight 66.3 ± 8.1), with a second degree ankle sprain, were treated with two different therapeutic strategies: 1) group A, with Aircast Air-Stirrup Ankle Brace functional support (9 male soccer players - average height 1.80 ± 0.05 - average age 24.7 ± 3.3 years - weight 75.6 ± 5.7) and 2) group B, with taping (9 soccer players, 7 men and 2 women - average height 1.73 ± 0.04 - average age 24.2 ± 3.9 years - weight 66 ± 7.7). All athletes were tested 30 days after injury; Lido Active isokinetic system was used to monitor peak torque, total work, average power of ankle evertors and invertors. **Results:** The findings of our study contribute to state that the strength of ankle invertors and evertors, tested at angular speeds of 30° , 60° , 90° and 120° sec., is significantly higher in group A than in group B, in all reference parameters, with a higher index in the peak torque and in the movement of inversion, at all angular velocities tested. **Conclusions:** Adopting a "dynamic and functional project" allowed us not only to safeguard the biological tissue healing process, but also to keep very good levels of evertor/invertor muscle strength. All this will allow us to develop a rational program of training, drawn up on the basis of individual characteristics and in relation to injury time in the season.

Abstract



P.M.N. Perera **Assessment of Osgood Disease among Teenager Footballers in Negombo, Srilanka** Ita J Sports Reh Po 2015; 2; 4 ; 413 - 419; doi : 10.17385/ItaJSRP.015.3012 ISSN 2385-1988 [online] IBSN 007-111-19-55

Football is an upcoming game in Negombo, Srilanka among teenage sportsmen. A descriptive cross-sectional study was carried out and data were gathered from 224 number of randomly selected football players(male) Interviews were conducted among 224 football players and 45 (20.8%) of them have been sufferings from Osgood disease. They have been following Ayurvedic treatments, Western medicine and Conservative management (Self-care). Its percentages were respectively 28.8%, 55.5% and 13.3%. Among players who have followed Western medicine, 76% of them have consulted doctors and balances 24% have consulted physiotherapists. Among injurers, 8.8% were between 12yrs to 13yrs. 71.8% were between 14yrs to 15yrs. 17.7% were between 16yrs and 17yrs. 2.2% were between 18yrs and 19yrs. It was understood that the most injured age group was 14yrs to 15yrs. Also, it was noted that they were not aware of the importance of physiotherapy at all (Only 13.3% of the sample have consulted physiotherapists solely).

Abstract



R. Flowers

Sacral Stress Fracture in an Adolescent Dancer Ita J Sports Reh Po 2015 ; 2; 4 ; 420 - 428;
doi 10.17385/ItaJSRP.015.3013 ISSN 2385-1988 [online] - IBSN 007-111-19-55

Sacral stress fractures are a fairly uncommon injury that if gone undiagnosed can cause significant morbidity. The incidence is not well known and is thought to be underreported, due to vague symptoms that can mimic other more common injuries, such as muscle strains and sciatica. The following case outlines an adolescent female with a less common presentation of a sacral stress fracture and a slow progressive return to activity. This article will also present a brief review of the literature focusing on the pathophysiology, presenting symptoms, diagnosis, treatment, and expected length of recovery for sacral stress fractures. Although this injury is uncommon, it often presents with common symptoms, and the clinician should not overlook it as a possible diagnosis.

Abstract



J. A. Giandonato, V. M. Tringali, C. D. Policastro

Evaluative Analysis of Interventive and Preventative Physical Activity Initiatives within Occupational Environments Ita J Sports Reh Po 2015 ; 2; 4 ; 429 - 441; doi : 10.17385/ItaJSRP.015.3014
ISSN 2385-1988 [online] - IBSN 007-111-19-55

This summative literature review examines the establishment and efficacy of multiple strategies aimed to improve an assortment of metrics associated with occupational performance, musculoskeletal and metabolic health, psychosocial domain, and longevity. The role of physical activity based interventions and prevention programs will be emphasized, as will outcomes and suggested actionable strategies emanating from a theoretical amalgamation of public health, exercise science, and human resource management.



Official Journal of the :

Ita. J. Sports Reh. Po.
Italian Journal of Sports Rehabilitation and Posturology

Ita. J. Sports Reh. Po.
Italian Journal of Sports Rehabilitation and Posturology

Ita. J. Sports Reh. Po.
Italian Journal of Sports Rehabilitation and Posturology

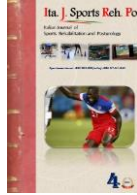
Ita. J. Sports Reh. Po.
Italian Journal of Sports Rehabilitation and Posturology

**Italian Scientific Society of Rehabilitation and Posturology of the Sports
Italian Football Medical Association
Italian kinesiological Taping Association
Italian Group for Evidence Based Sport Osteopathy**

OAJI Open Academic
.net Journals Index

Italian Journal of Sports Rehabilitation and Posturology
ISSN 2385 -1988 [online]





J. A. Giandonato, V. M. Tringali,
Making the Case for Exercise and Fitness Professionals Leading Wellness Programs
Ita J Sports Reh Po 2015 ; 2; 4 ; 342 -344 ; doi : 10.17385/ItaJSRP.015.3006
ISSN 2385-1988 [online] - IBSN 007-111-19-55

342

Ita. J. Sports Reh. Po.

Italian Journal of
Sports Rehabilitation and Posturology

Editorial

Making the Case for Exercise and Fitness Professionals Leading Wellness Programs

Authors : Joseph A. Giandonato, and Victor M. Tringali

Technological advances in conjunction with a reduction in laborious occupational demands have significantly contributed to escalating obesity rates in the United States throughout the past half century. According to Centers for Disease Control and Prevention estimates, the percentage of obese Americans has ballooned from 13% in 1962 to 35.7% in 2008 ². Sedentary behaviors and physical inactivity are correlative with increased rates of cardiovascular disease diagnose and stroke, which mark the two of the most prevalent causes of death within the US. In response to the resounding, yet largely preventable public health crises, legislators and organizations scramble to enact strategic measures to mitigate economic impact.

Spearheading the effort to engender healthy behaviors among working Americans, organizations have begun implementing wellness programs. The creation and implementation of wellness programs, which are defined as employer directed initiatives aimed at improving the health and well-being of employees ⁵, and in some instances, their dependents, and communities in which they reside, are rationalized through widely documented benefits, including: increased productivity, improved morale, reduced absenteeism, and curtailing organizational healthcare premiums, compensation and disability claims, and direct medical costs¹. Wellness programs have also been purported to augment employee retention and recruitment efforts ¹.

Professionals hailing from medical, allied health, and public health and policy realms are often



J. A. Giandonato, V. M. Tringali,
Making the Case for Exercise and Fitness Professionals Leading Wellness Programs
Ita J Sports Reh Po 2015 ; 2 ; 4 ; 342 -344 ; doi : 10.17385/ItaJSRP.015.3006
ISSN 2385-1988 [online] - IBSN 007-111-19-55

343

commissioned by firms to lead wellness programs. While professionals arising from each sect encompass distinct attributes and in certain scenarios, the capacity to practice with professional licensure, individuals possessing a background in exercise science are best suited to handle the dual role of administrator and practitioner of health education and disease prevention. Academic programs in exercise science at the undergraduate and graduate levels cover an immense breadth of subject matter, often including electives in education, management, and statistics in conjunction with traditional coursework in physiology, biomechanics, and nutrition. When coupled with a background in fitness training or coaching, those in possession of sound theoretical exercise science acumen will prove adroit in their provision of actionable strategies, thus enhancing constituency engagement, a key determinant in the success of wellness programs.

Literature has suggested that wellness programs consisting of physical activity demonstrated improvements in health related quality of life, reduced absenteeism³, and attendant improvements in multiple biomarkers, including streamlined insulin control⁴, decreased body fat percentage and serum cholesterol concentrations⁷. The establishment of physical activity as a vital tenet within a wellness program may prove efficacious among employees, as many workers remain sedentary for a disproportionate amount of their work hours⁶.

Based on the aforementioned inferences in conjunction with a combined four decades of experience in the wellness and fitness industries, it is our communal assertion that degreed exercise and fitness professionals are worthy of consideration in leading wellness programs.

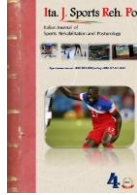
In good health and happiness,



Joseph A. Giandonato, MBA, MSc, CSCS
Drexel University - International Associate Board Member , Ita J Sports Reh Po



Victor M. Tringali, MSc, CSCS
Drexel University - International Associate Board Member , Ita J Sports Reh Po



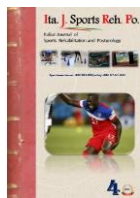
J. A. Giandonato, V. M. Tringali,
Making the Case for Exercise and Fitness Professionals Leading Wellness Programs
Ita J Sports Reh Po 2015 ; 2; 4 ; 342 -344 ; doi : 10.17385/ItaJSRP.015.3006
ISSN 2385-1988 [online] - IBSN 007-111-19-55

References

344

1. Berry, L.L., Mirabito, A.M., & Baun, W.B. (2010). *What's the hard return on employee wellness programs?* Boston, MA: Harvard Business Review. Retrieved from <http://hbr.org/2010/12/whats-the-hard-return-on-employee-wellness-programs/ar/1>
2. Centers for Disease Control and Prevention. (2010). *Table 71: overweight, obesity, and healthy weight among persons 20 years of age and over, by selected characteristics: United States, selected years 1960-1962 through 2005-2008*. Retrieved from <http://www.cdc.gov/nchs/data/hus/2010/071.pdf>
3. Edries, N., Jelsma, J. & Maart, S. (2013). The impact of an employee wellness programme in clothing/textile manufacturing companies: a randomized controlled trial. *BMC Public Health*, 13, 25.
4. Kramer, M.K., Molenaar, D.M., Arena, V.C., Vendetti, E.M., Meehan, R.J., Miller, R.G., Vanderwood, K.K., Eaglehouse, Y., & Kriska, A.M. (2015). Improving employee health: evaluation of a worksite lifestyle change program to decrease risk factors for diabetes and cardiovascular disease. *Journal of Occupational and Environmental Medicine*, 57, 284-291.
5. Mujtaba, B.G. & Cavico, F.J. (2013). Corporate wellness programs: implementation challenges in the modern American workplace. *International Journal of Health Policy and Management*, 1, 193-199.
6. Parry, S. & Straker, L. (2013). The contribution of office work to sedentary behavior associated risk. *BMC Public Health*, 13, 296.
7. Proper, K.L., Hildenbrandt, V.H., Van der Beek, A.J., Twisk, J.W., & Van Mechelen, W. (2003). Effect of individual counseling on physical activity fitness and health: a randomized controlled trial in a workplace setting. *American Journal of Preventative Medicine*, 24, 218-226.





P. Tamburrino, R. D'Onofrio, A. Tucciarone
Ankle Sprains in Professional Soccer Players. Isokinetic Strength of Evertors and Invertors Muscles after Ankle Sprains Treated With Two Different Dynamic Protection
Ita J Sports Reh Po 2015 ; 2 ; 4 ; 406 - 412; doi : 10.17385/ItaJSRP.015.3011
ISSN 2385-1988 [online] - IBSN 007-111-19-55

406

Ita. J. Sports Reh. Po.

Italian Journal of
Sports Rehabilitation and Posturology

Ankle Sprains in Professional Soccer Players. Isokinetic Strength of Evertors and Invertors Muscles after Ankle Sprains Treated with Two Different Dynamic Protection

Authors : Pasquale Tamburrino¹, Rosario D'Onofrio,¹ Agostino Tucciarone²

¹ Medical Staff Olympic Training Centre, Formia (Latina) Italy

² Orthopaedic Surgeon and Sports Medicine Physician ICOT, Head of Medical Staff, Latina FC

Abstract

Purpose: The aim of this study was to investigate the effects of two forms of immobilization in ankle sprains on the strength of evertor and invertor muscles, in order to draw up a rational training plan, designed to speed up the athlete's return to competitive sport.

Methods: A total of 18 soccer players (average height 1.76 ± 0.05 - average age 24.5 ± 3.5 - average weight 66.3 ± 8.1), with a second degree ankle sprain, were treated with two different therapeutic strategies: 1) group A, with Aircast Air-Stirrup Ankle Brace functional support (9 male soccer players - average height 1.80 ± 0.05 - average age 24.7 ± 3.3 years - weight 75.6 ± 5.7) and 2) group B, with taping (9 soccer players, 7 men and 2 women - average height 1.73 ± 0.04 - average age 24.2 ± 3.9 years - weight 66 ± 7.7). All athletes were tested 30 days after injury; Lido Active isokinetic system was used to monitor peak torque, total work, average power of ankle evertors and invertors.

Results: The findings of our study contribute to state that the strength of ankle invertors and evertors, tested at angular speeds of 30° , 60° , 90° and 120° sec., is significantly higher in group A than in group B, in all reference parameters, with a higher index in the peak torque and in the movement of inversion, at all angular velocities tested.

Conclusions: Adopting a "dynamic and functional project" allowed us not only to safeguard the biological tissue healing process, but also to keep very good levels of evertor/invertor muscle strength. All this will allow us to develop a rational program of training, drawn up on the basis of individual characteristics and in relation to injury time in the season.

Key word : Ankle sprains, Ankle brace, Ankle taping, Isokinetic, Soccer injury



Introduction

Ankle sprains are one of the most common injuries^{1,2,8} in sports in general and soccer in particular. Researchers have estimated that ankle injuries account for 11 to 33% of all sports related injuries in athletes.^{4,5,6}

Sixteen percent of all injuries at the 2006 FIFA World Cup in Germany were to the ankle.¹⁰ The rate of ankle injury in Germany was 11.6 injuries per 1000 match hours, which works out to about one ankle injury about every 2.5 matches. Ankle injuries can be defined as either acute or chronic, with ligamentous injury the most common acute diagnosis. About 85% of all ankle injuries are ankle sprains involving the lateral ankle ligaments. Following an acute ankle sprain, pain, swelling and ecchymosis are common, which may contribute to reduced mobility and function, as well as occupational absence.

The rehabilitation of ankle injuries include controlling the acute inflammatory process, regaining full ankle range of motion, increasing muscle strength and power, and improving proprioceptive abilities.

Strengthening exercises such as toe raises, calf press and the use of rubber tubing or a towel to resist side-to-side ankle movements should be performed.

An ankle sprain may leave an athlete out of play for several weeks, and in many cases full recovery takes much longer. The decision to RTP following an ankle injury is a multifactorial process. Functional testing provides objective measures for gauging an athlete's progression through the rehabilitation and reconditioning Training . Many athletes from different sports think that taping and bracing is important in acute and chronic phases of an ankle injury. Functional performance effects of ankle taping and bracing have been assessed in both injured and uninjured subjects.⁹

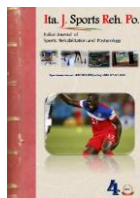
The aim of this study was to investigate the effects of two forms of immobilization in ankle sprains³ on the strength of evertor and invertor muscles, in order to draw up a rational training plan, designed to speed up the athlete's return to competitive sport.

Methods

Eighteen soccer players (mean±SD age 24.5±3.5 yrs; height 1.76±0.05 m; weight 66.3±8.1 kg), with a second degree ankle sprain, were treated with two different therapeutic strategies:

- 1) **Group A**, with Aircast Air-Stirrup Ankle Brace (DJO Italia srl, Italy) functional support (9 male soccer players (24.7±3.3 yrs; 1.80±0.05 m; 75.6±5.7 kg);

Group A : consisted of 9 athletes, all of them followed a therapeutic / rehabilitative strategy of unloaded weight for the first 10 days and, as protection, Air-Stirrup Ankle Brace functional support, which allowed a partial movement of ankle plantar flexion and dorsiflexion, and limited pronation and supination movements. This functional brace has the distinction of having anatomic valves, two small pre-inflated air cushions Duplex, providing protection and compression.



2) **Group B**, with taping (9 soccer players, 7 men and 2 women; 24.2±3.9 yrs; 1.73±0.04 m; 71.0±7.7 kg);

Group B : consisted of 9 athletes as the other group, and was treated with a therapeutic / rehabilitative strategy which included “stiff” inelastic taping for the first 10 days and unloaded weight. Taping was made with inelastic material according to current guidelines of the literature. This taping allowed a partial movement of ankle plantar flexion and dorsiflexion, and limited pronation and supination movements. Materials used: spray adhesive (Tensospray Sixtus), band of protection skinsaver (Tensoban Sixtus), vaseline, inelastic tape (Strappal Sixtus h 5 cm). The skin was carefully prepared through cleaning, hair removal and disinfection.

All players were tested 30 days after injury. Lido Active isokinetic system (Loredan Biomedical, West Sacramento, CA, USA) was used to monitor peak torque, total work, average power of ankle evertors and invertors at angular velocity of 30, 60, 90 and 120°/s.

Isokinetic Screening

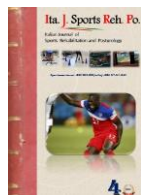
Follow-up was performed on the 30th day after injury, upon checking clinical status for absence of conditions that would contraindicate the testing, including for example: pain, edema and range of motion limitations. We monitored mean values of peak torque, total work and average power of ankle evertors and invertors. Both groups of athletes performed a warm-up consisting of 10 minutes exercise bike at 21 km/h, followed by 10 min. traditional stretching, Anderson method, for all muscle groups of lower kinetic chain and in particular the ankle joint for pronation and supination movements with elastic tubing as test preparation.(Figure 1)

Isokinetic test protocol
10 repetitions as warm – up
5 repetitions eversion/inversion
Speed investigated: 30 °, 60 °, 90 ° and 120 ° / sec.
20 seconds recovery between one set of repetitions and the next

Figure 1 . Isokinetic test protocol.

Results

Strengths of ankle invertors and evertors are significantly higher in group A than in group B, in all reference parameters (P<0.05), with higher peak torques in the movement of inversion, at all angular velocities tested . (P<0.05) (Tables 1,2,3)



Group	Movement	30°/s	60°/s	90°/s	120°/s
Group A	Inversion	54.2±0,2	50.0±9,3	42.2±1,1	37.2±6,6
Group B	Inversion	30.0±5,6	24.0±3,2	24.2±2,9	20.4±0,1
Group A	Eversion	36.2±7,3	38.4±6,7	31.0±0,6	27.2±5,4
Group B	Eversion	27.1±5,3	21.1±2,5	20.3±1,3	17.2± 0.4

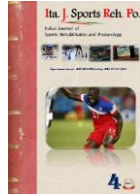
Table 1. Mean±SD values of peak torque (Nm) in both groups of players

Group	Movement	30°/s	60°/s	90°/s	120°/s
Group A	Inversion	32.1±5,4	34.4±3,1	32.1±2,2	25.2±0,9
Group B	Inversion	23.2±1,3	22.2±0,5	22.2±2,0	16.3±3,5
Group A	Eversion	23.2±1,7	27.2±1,1	21.3±0,8	20.2±0,6
Group B	Eversion	23.0±2,8	21.2±0,2	18.5±9,1	15.6±0,8

Table 2. Mean±SD values of total work (J) in both groups of players.

Group	Movement	30°/s	60°/s	90°/s	120°/s
Group A	Inversion	14.4±9,1	26.2±3,5	35.2±3,1	39.0±5,1
Group B	Inversion	8.2±8,3	15.4±5,1	24.1±2,1	25.1±8,2
Group A	Eversion	8.3±5,4	19.0±4,8	23.3±5,4	28.6±1,9
Group B	Eversion	8.0±5,2	15.3±7,8	20.1±1,1	22.2±1,3

Table 3. Mean±SD values of average power (W) in both groups of players.



P. Tamburrino, R. D'Onofrio, A. Tucciarone
Ankle Sprains in Professional Soccer Players. Isokinetic Strength of Evertors and Invertors Muscles after Ankle Sprains Treated With Two Different Dynamic Protection
Ita J Sports Reh Po 2015 ; 2; 4 ; 406 - 412; doi : 10.17385/ItaJSRP.015.3011
ISSN 2385-1988 [online] - IBSN 007-111-19-55

410



Photo 1 – Return to Training

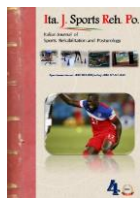
Return to training (Photo 1) (or return to competitions) was $4,7 \pm 4$ week in group A and $5,7 \pm 0,6$ weeks in group B respectively ($P < 0.05$).

Conclusions

Final results show in group A a clear constant and very good keeping of strength in all reference parameters, that is: peak torque, total work and average power, compared to group B. Isokinetic monitoring of all athletes, 30 days after injury, showed an evident difference in group A (brace) in ankle inversion at all test angular velocities (compared to eversion. (tables 1,2,3,) This especially in peak torque inversion at $30^\circ/\text{sec}$. where difference is more than 44.6%, and at $60^\circ/\text{sec}$. where difference is even higher than 52%, in athletes treated with functional brace. Data analysis shows that the major difference relates to peak torque, rather than to total work and average power.

The average total work is significantly constant and contained in the two groups. As for total work in eversion, at $30^\circ/\text{sec}$. there are no evident differences, whereas at angular velocity of $60^\circ/\text{sec}$., the monitoring carried out shows a substantial difference.

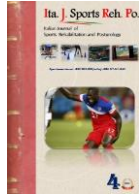
Final Report Conclusion. Using a functional brace is a therapeutic strategy for a quick return to sporting activity. It is the best compromise for both physiological and sporting recovery, for a fast return to competitions.



P. Tamburrino, R. D'Onofrio, A. Tucciarone
Ankle Sprains in Professional Soccer Players. Isokinetic Strength of Evertors and Invertors Muscles after Ankle Sprains Treated With Two Different Dynamic Protection
Ita J Sports Reh Po 2015 ; 2; 4 ; 406 - 412; doi : 10.17385/ItaJSRP.015.3011
ISSN 2385-1988 [online] - IBSN 007-111-19-55

Reference

1. Tamburrino P. D'Onofrio R., Pintus A.
Il bendaggio funzionale nella prevenzione dei traumi distorsivi della tibio tarsica. Analisi della recente letteratura (Notiziario del settore tecnico F.I.G.C. 2001,3,46-49
2. Billi A... D'Onofrio, R
Traumatologia del Basket : analisi retrospettiva delle lesioni Il Medico sportivo 2,(4) 2002,10-11-26
3. Lanzetta A.
Le lesioni capsulo-legamentose della caviglia nella traumatologia sportiva
Ciba-geigy
4. D'Onofrio, R.
Instabilità Cronica della caviglia: concettualità e management funzionale FitMed 4, 6,14 17 ; 2012
5. D'Onofrio R, Manzi V, Pintus A. D'Ottavio S.
Analisi epidemiologica sulle distorsioni di caviglia nel calcio. A review internazionale FitMed 1,4, 12-15 ,2009
6. Zouita A,
The effect of 8-weeks proprioceptive exercise program in postural sway and Isokinetic strength of ankle sprains of Tunisian athletes Ann Phys Rehabil Med. 2013 Dec;56(9-10):634-43.
7. David P ,
Isokinetic testing of evertor and invertor muscles in patients with chronic ankle instability. J Appl Biomech 2013 Dec;29(6):696-704. Epub 2013 Jan 18.
8. Tamburrino P. D'Onofrio R.
Statistical epidemiological trends of injuries in European Handball. Retrospective analysis Ita J Sports Reh Po 2 ; 2; 86 - 102 : 2015 ; ISSN 2385-1988 [online] - IBSN 007-111-19-55
9. Pienkowski D, McMorrow M, Shapiro R, et al. The effect of ankle stabilizers on athletic performance: a randomized prospective study. *Am J Sports Med.* 1995; 23:757-62.
10. Dvorak J, A Junge, K Grimm, D Kirkendall. Medical Report from the 2006 FIFA World Cup Germany. *Brit J Sports Med* 41:578-581, 2007.



P. Tamburrino, R. D'Onofrio, A. Tucciarone
Ankle Sprains in Professional Soccer Players. Isokinetic Strength of Evertors and Invertors Muscles after Ankle Sprains Treated With Two Different Dynamic Protection
Ita J Sports Reh Po 2015 ; 2; 4 ; 406 - 412; doi : 10.17385/ItaJSRP.015.3011
ISSN 2385-1988 [online] - IBSN 007-111-19-55

412





Ita. J. Sports Reh. Po.

Italian Journal of
Sports Rehabilitation and Posturology

