

Scientific research on the influence of muscle activation time of the tibialis anterior and medial gastrocnemius on the mechanics of the first metatarsal in Taekwondo and Wushu Sword.

Dr. Lorenzo Andaloro – Podiatrist, – Foot & Ankle Surgeon - Medical Director of the Podiatry Centre in Florence - Independent Researcher in Lower Limb Biomechanics - Prof . with an MA in Biomechanics, University of Florence, Italy

Background: The various scientific researches demonstrated function relation between Achilles tendon and first matatarsal. This correlation can bring some mechanic modification of foot, also cause energy loss of athletic movement and lead to different pathologies. Each year in Italy estimated 300 000 of traumas in sports occur. Over 50% of this injuries occur due to incorrect prevention.
Study design: Randomized controlled clinical study; level of evidence, 1.
Objectives: The purpose of this study was to analyze influence of function of Medial Gastrocnemius and Tibial Anterior on the foot's mechanic in Taekwondo and Wushu Swords at a competitive level. Our aim was also to demonstrate that by controller the pronation between orthese and modification of foot's biomechanic, athletes can achieve better performance and prevent injures.
Methods: We evaluated an athletes of Taekowondo at competitive level (FITA – Federation Italian Taekowondo); and the Italian champions of Wushu Sword; from January 2015 to June 2016. We analyzed plantar pressure in static and dynamic with platform (foot AM cube®). The athletic movement was studied using an innovative Electromyography technology including bluetooth and wi-fi, BTS® emg-analyzer is the most complete software solution for emg signal analysis of Tibial and Gastrocnemius.
After biomechanic examination, we exposed the athletes to orthotic therapy.
Results: With orthoses into the 2 and 3 seconds the Tibial anterior and Gastrocnemius medial muscle activation time is equal. There is an increase the propulsion force of 25%. The tibial tarsal articulation remains in static balance.
Conclusion: We demonstrate that by pronation controll with a orthese that

supports the first metatarsal there is a dynamic balance between the muscles of the leg and the foot, can achieve better athletic movement, prevent pathologies of legs, especially in Wuschu Swords and Takwondo. This research open interesting chapter on importance of relationship in sports medical team in order to unite new techniques of biomechanic analysis to innovative, non-invasive and preventive therapy. Moreover, this therapy can bring economic savings in management of prevention of injuries in sport.

Keywords:. Tibialis anterior and medial Gastrocnemius Wuschu Swords and Takwondo. biomechanic of athletics movement, prevention of leg injuries.

Name: Andaloro Lorenzo

Nationality: Italian

www.centropodologico.com

andalorolorenzo@gmail.com

Category: Poster presentation

Dr. Andaloro graduated in Podiatry, from the University of Florence, in 2005. He then went on to continue his education at the University of Barcelona (Spain), specializing in Podiatry Sports as well as Diseases Biomechanical Apparatus. Additionally he received a Master in foot surgery. He is currently the Director of the Foot Center of Florence, Italy. He has participated in numerous courses and congresses, in particular in 2014 and 2016 when he was a speaker at the World Congress of Health in Dubai.. Since 2014 he has been a registered Podiatrist of Spain, under No. 0331 and n 5 Italy. SIPO (Italian asociation of podiatry). Currently he is Professor at the Medical University in Florence, Italy