Mini-Orals

MO-BN04 Rehabilitation and prevention

IDENTIFICATION OF INTRAMUSCULAR TISSUE OEDEMA AND CHANGES IN MUSCLE CONTRACTILE PROPERTIES INDUCED BY DRY NEEDLING

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INTRODUCTION: Myofascial trigger points are a common cause of clinically observed local muscle pain and tenderness. The improvement associated with the muscle relaxing effect (reduction of muscle stiffness) produced by dry needling (DN) is still not well understood. In this regard, it is believed that the regeneration of tissue destroyed by dry needling through the inflammatory process should do with the return to normality of muscle contractility. A contractility marker (muscle belly displacement, Dm) has been associated with changes in muscle stiffness (increase in Dm = decrease in stiffness and vice versa). The aim of this study was to identify via magnetic resonance imaging (MRI) if the local inflammatory response is immediately induced by DN as well as changes in Dm of asymptomatic patients.
METHODS: 18 asymptomatic patients participated in the study. We used an inter-group research design to investigate the regional-signal differences of MRI measurements in the gastrocnemious medialis (GM), before and after 1h DN. The research unit of analysis was the GM. The GM that presented more pain to pressure and reported by visual analogue scale was used for further analysis. The contralateral GM was used as a control group (CG) while the other one was considered the experimental group (EG). MRI Short tau inversion recovery (STIR, signal intensity) was used to identify signal changes due to by local inflammation. Changes in contractile muscle properties were assessed by tensiomyography using the key parameter: Dm (mm). An ANOVA was performed to analyse the influence of DN on the STIR variable and a t-test for dependent samples was performed to compare the pain perception after the DN.
RESULTS: The STIR (signal intensity) increased 128.97 % after the DN. The interaction effect showed significant differences (F(1,34) =235, p =0.0001, r =0.93). Bonferronis post hoc tests showed significant differences [mean differences and 95% confidence interval (95% CI) =198 (172 – 224)] signal intensity (F (1,34) =236, p =0.001; r =0.93; d =5.03). The difference between the CG vs. EG in Dm variable was 24.04 % after the DN. In addition, there was a significant effect of the group variable (i.e., CG vs. EG) after controlling the effects with the pre- variable (F(1,33) = 9.95, p =0.003, r =0.48, d =1.10. In relation to pain perception, a significant reduction (t(17) = 12.40, p =0.001, r =0.65, d =1.71) were found. Pearsons correlation did not show correlation between any variable.
CONCLUSION: Intramuscular oedema appears immediately after (1h) of the application of DN, therefore indicating an inflammatory process with unexpected reduction in the pain perception. A loss of muscle contractility measured by Dm did not correlate with changes in the STIR. Our results are in line with others found in mice showing signs of an inflammatory response after DN. Our research was limited for the lack of subsequent measurements of MRI to detect when the edema was removed.

THE EFFECTIVENESS OF ANTI-PRONATION TAPING IN LOWER EXTREMITIES STIFFNESS TO LOW MEDIAL LONGITUDINAL ARCH PEOPLE DURING LANDING PHASE

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INTRODUCTION: Flat foot is one of the most common foot deformities. Possible risks factors for the development of flat foot include obesity, muscle unbalance or foot structure deformity. The low-dye taping (LDT) was first used to help athletes with flat foot to improve their performance. Furthermore, some studies used it on flat foot patients and showed improvement in pain and walking ability. However this study showed the short term effect in ankle joint with LDT. Furthermore, according to the kinematic chain, the flat foot may also affect upper joint by rotating the tibia & hip. Those changes will lead hip and knee joint suffer more stress. Therefore, this study aims to find out if the LDT taping would affect landing impact through LE joint.
METHODS: Fourteen participants between 20 to 30 years old were recruited from Tainan area. Low longitudinal arch (low arch) subjects were randomly assigned to 2 groups, intervention group or placebo group. All participants met the inclusion criteria of having a low foot arch- the Navicular drop test over 8mm, Visual Analog Scale below 6. Participants are free of substantial lower limbs injury in the 6 months before the study, such as a sprain and other symptoms that would affect landing tasks.
Navicular drop test (NDT) was using the navicular drop height to evaluate the severity of flat foot. The 3D motion data and vertical ground reaction force (vGRF) collection were conducted before and after intervention using 8 infrared cameras (Eagle camera system, Motion Analysis Corporation, USA) and two kistler force plates. The whole body marker set was used for COM calculation. There were 3 different jump tasks that including double legs forward landing (DLL), single leg forward landing (FL), and single leg side landing (SL). Those single leg landing tasks mentioned above concluded both right and left jump landing tasks. These tasks were performed in a random order. The outcome measure is lower extremity stiffness, calculated as (maximum vGRF)/range of center of mass (COM). The higher lower extremity stiffness (LES) means body landing with a stiffer way.
RESULTS: The LES in intervention group showed a decreasing trend. LES during double leg landing before and after taping are 0.298/0.265. LES during forward single leg landing before and after taping are 0.354/0.195. LES during sideward single leg landing before and after taping are 0.329/0.224. In the placebo group, the LES values in two conditions are similar. The decreased lower extremity stiffness may show that the anti-pronation taping skill could improve support ability in flat foot population. Furthermore, the lesser stiffness means lower extremity joints can suffer from lesser force during landing.
CONCLUSION: The changes in lower extremity stiffness shows that there must be landing mechanism differences during these tasks. However, the relationship between kinematic data and kinetic data in this study need further study to explain the mechanism behind.

IMPACT OF A STRENGTH INTERVENTION PROGRAM ON CHANGE IN HAMSTRING:QUADRICEPS RATIO

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INTRODUCTION: The most common knee joint injury is the rupture of the anterior cruciate ligament (ACL). When the H:Q (hamstrings:quadriceps) ratio is too low, the risk of ACL injury increases (Holcomb et al, 2007). The H:Q ratio can be expressed based on mus-