

Research Proposal

The immediate effect of a Single Clinical Intervention on Serve Velocity in Elite Tennis Players with Low Back Disorders: A Double Blind RCT.

Introduction:

Tennis players, and other athletes suffer from back disorders at least as the rest of the general population. It has been demonstrated that the ATM2 has an immediate effect on reducing pain and increasing range of motion on low back pain sufferers, and that the tennis serve velocity has been used as a reliable measure of elite tennis players' functional ability. The purpose of this study therefore is to measure the immediate effect of a single ATM2 intervention on serve velocity in elite tennis players with low back disorders

Proposal:

In the literature there is a controversy as to the relationship between athletic performance and low back pain. It has been demonstrated that tennis players may be at an increased risk of lumbar disc pathology from rotational and hyperextension shearing effects(Hainline, 1995), and that athletes with great demands on the back are subjected to an increased risk of symptomatic damage of the spine(Sward, Hellstrom, Jacobsson, & Peterson, 1990). Additionally, a survey of the Men's Professional Tennis Tour indicates that 38 per cent of 143 tennis players missed at least one tournament because of low back problems(Marks, Haas, & Wiesel, 1988). However an interview-based cross-sectional study found no evidence that playing tennis involves a higher risk of low back pain with or without sciatica(Saroux et al., 1999), and a long term follow up study demonstrated that despite significantly more radiological abnormalities among former top athletes, they did not report higher frequency of back pain than the non-athletes(Lundin, Hellstrom, Nilsson, & Sward, 2001).

Serve velocity has been used as the functional evaluation of performance enhancement in elite tennis players after various shoulder rehabilitation programs(Cohen, Mont, Campbell, Vogelstein, & Loewy, 1994). Various shoulder strengthening and stretching programs have been functionally evaluated on elite tennis players by measuring serve velocity(Ellenbecker, Davies, & Rowinski, 1988; Treiber, Lott, Duncan, Slavens, & Davis, 1998).

The ATM2 has been demonstrated to have a clinically significant immediate effect on reducing pain and increasing range of motion in low back pain sufferers (Moran, 2002). Additionally clinical data has confirmed that the ATM2 decreases significantly the amount of treatments to resolve low back disorders(Archambault, 2002). Although the ATM2 is used to treat low back disorders in top college and professional athletic facilities on a daily basis, to date no research has been

reported as to the effect of the ATM2 on sporting performance on athletes suffering from low back disorders.

The purpose of this study therefore is to use the tennis serve velocity as a reliable measure to determine the immediate functional effect of the ATM2 treatment on elite tennis players with back pain or discomfort.

Design:

Elite tennis players complaining of back pain or discomfort will be included in this population. They will be randomly allocated in two groups, the intervention group and the control group.

After a warm-up according to players preference the intervention group will perform 10 serves to the maximum of their ability, while the velocity is measured with a radar gun. Measures of pain or discomfort will be measured too (?). The players will then undergo a uniform series of active resisted movements on the ATM2 while their body will be restrained in a pain free position. Another 10 serves will follow this, and velocities measured as before.

The control group will undergo the identical sequence. They will perform the same active resisted exercises on the ATM2, but without locating and restraining their body in a pain free position.

All of the people performing measurements will be blinded to the intervention, and the clinicians performing the interventions will be blinded to the measurements.

Analysis:

The average velocity, and peak velocity will be measured before and after the intervention, in both groups. These figures will be statistically analyzed to determine the differences between groups.

Conclusion:

Pain, and back pain in particular will hinder athletic performance. The ability to improve this hindered sporting performance in an active natural way is of utmost importance to all sportspeople, coaches, managers and clinicians. Therefore it is important to identify a specific clinical intervention tool that will immediately effect the functional sporting ability in an active manner without the usage of medication or invasive measures. Positive results from this study will have a significant impact on the entire sporting world.

References:

Archambault, M. L. (2002). *The PelvicRestrainer (ATM2) is a breakthrough in treating Lower Back Pain*. Windsor, CA: BACKtoGOLF Performance & Fitness Physical Therapy.

- Cohen, D. B., Mont, M. A., Campbell, K. R., Vogelstein, B. N., & Loewy, J. W. (1994). Upper extremity physical factors affecting tennis serve velocity. *Am J Sports Med*, 22(6), 746-750.
- Ellenbecker, T. S., Davies, G. J., & Rowinski, M. J. (1988). Concentric versus eccentric isokinetic strengthening of the rotator cuff. Objective data versus functional test. *Am J Sports Med*, 16(1), 64-69.
- Hainline, B. (1995). Low back injury. *Clin Sports Med*, 14(1), 241-265.
- Lundin, O., Hellstrom, M., Nilsson, I., & Sward, L. (2001). Back pain and radiological changes in the thoraco-lumbar spine of athletes. A long-term follow-up. *Scand J Med Sci Sports*, 11(2), 103-109.
- Marks, M. R., Haas, S. S., & Wiesel, S. W. (1988). Low back pain in the competitive tennis player. *Clin Sports Med*, 7(2), 277-287.
- Moran, K. (2002). *The immediate effect of a single exercise session using the PelvicRestrainer® on lumbar symptoms in chronic lumbo-pelvic pain subjects*. Dublin: Dublin City University.
- Saroux, A., Guillodo, Y., Devauchelle, V., Allain, J., Guedes, C., & Le Goff, P. (1999). Are tennis players at increased risk for low back pain and sciatica? *Rev Rhum Engl Ed*, 66(3), 143-145.
- Sward, L., Hellstrom, M., Jacobsson, B., & Peterson, L. (1990). Back pain and radiologic changes in the thoraco-lumbar spine of athletes. *Spine*, 15(2), 124-129.
- Treiber, F. A., Lott, J., Duncan, J., Slavens, G., & Davis, H. (1998). Effects of Theraband and lightweight dumbbell training on shoulder rotation torque and serve performance in college tennis players. *Am J Sports Med*, 26(4), 510-515.