THE INFLUENCE OF HYPERPRONATION OF THE FEET ON PELVIC ALIGNMENT IN STANDING

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Introduction

Pronation of the foot is an essential motion of the normal function of the lower extremity. Its main contribution to the gait cycle is shock absorption and adaptation of the weight bearing foot to the surface. Hyperpronation is defined when hind foot motion is excessive, prolonged, and/or occurs in inappropriate timing of the stance phase (Donatelli, 1987).

Hyperpronation of the foot may cause mal alignment of the lower extremity and frequently leads to injuries of joints, tendons, knee pain and stress fractures (Tiberio 1988). There is no evidence documented on the relationship between hyperpronation and pelvic alignment in the sagittal plane although, several researchers do suggest a possible interrelationship (Gross, 1995; Tiberio, 1987; Tiberio 1988).

Aim

The purpose of this study is to examine the effect of hyperpronation of the feet on lower limb alignment and in particular, on the pelvic girdle position.

Method

Thirty five healthy subjects (15 men and 20 women, age 23 - 33 years) were put into hyperpronation in standing position, induced by wedges of different slopes (10° 15° and 20°).

Results

The results indicate that as a consequence of induced hyperpronation, a statistically significant (t-test) increase in calcaneal valgus (p<.000), internal tibial rotation (p<.001), internal femoral rotation (p<.000) and anterior pelvic tilt (p<.009) was found (Fig 4).

Conclusion

These finding suggest that a correlation exists between motion at the distal segment (the foot) and the proximal segment (the pelvis). Hyperpronation affected mainly shank internal rotation, while latter was highly correlated with anterior pelvic tilt.

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