The inter- and intra-tester reliability of the clinical measurement of navicular drop and drift

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INTRODUCTION

Evaluation of rearfoot function is an important component of clinical biomechanics. Frontal plane calcaneal position is perhaps the most common method of rearfoot measurement. However, recent studies have shown this method to be unreliable (Freeman, 1990; Menz and Keenan, 1997), thus indicating the need for a more consistent technique. Traditionally, the focus of rearfoot measurement has been placed on the talo-calcaneal joint. However, work by Lundberg and Svesson (1993) and Kitaoka et al (1995) indicates that the talo-navicular joint undergoes a greater displacement during rearfoot pronation than the talo-calcaneal joint. Furthermore, a number of studies have implicated excessive movement of the navicular / talo-navicular joint in the development of lower limb pathology. Medial bulging of the talo-navicular joint has long been used as an indicator of excessive pronation both in static and dynamic analysis (Gould, 1983), so it follows that quantification of this movement could be a valid indicator of excessive pronation. The aim of this study was therefore to determine the reliability of two navicular displacement measurement techniques - navicular drop and navicular drift - both within and between clinicians.

METHOD

Twenty normal healthy participants were measured by five podiatrists with a minimum of three years post-graduate experience on two separate occasions. During each session, measurements were taken from both feet of each participant three times, by each podiatrist.

RESULTS

Data were analysed using Pearson’s r correlation coefficients and the standard error of measurement (SEM), calculated at the 95% confidence interval. Averaged correlation coefficients for the measurement of navicular drift ranged from 0.32 to 0.77, with a confidence interval between +/- 3.32 to +/- 5.48 mm. The highest correlation coefficient (r = 0.84) reported from navicular drop data was observed with the average of three measurements taken from the left foot. The least reliable navicular drop measurement was the inter-tester comparison of the first of three measures of both feet which produced a Pearson’s r value of r+0.56. Ninety-five percent confidence intervals for navicular drop ranged from +/- 2.86 to +/- mm.

CONCLUSION

Results of this study indicate that neither technique investigated is sufficiently reliable to be clinically acceptable for the evaluation of rearfoot function. Further research is required to
determine whether the techniques can be modified to improve reliability, or to devise a more appropriate clinical method of rearfoot measurement.

REFERENCES


