



WHAT IS THE INFLUENCE OF LOWER LIMB JOINT HYPERMOBILITY ON NEUROMUSCULAR PERFORMANCE IN YOUNG GREEK GYMNASTS?

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BACKGROUND

Although, increased flexibility is a requirement in gymnastics¹, joint hypermobility and potentially associated ligament laxity and instability is an area of focus concerning injury risk factors in sports². Previous research has shown that poor neuromuscular control can lead to injury in a young sporting population³. However, the influence of joint hypermobility on neuromuscular control in young gymnasts remains unclear.

Objectives

1. To determine the prevalence of lower limb hypermobility (LLH)
2. To explore the influence of lower limb hypermobility on neuromuscular performance in young gymnasts

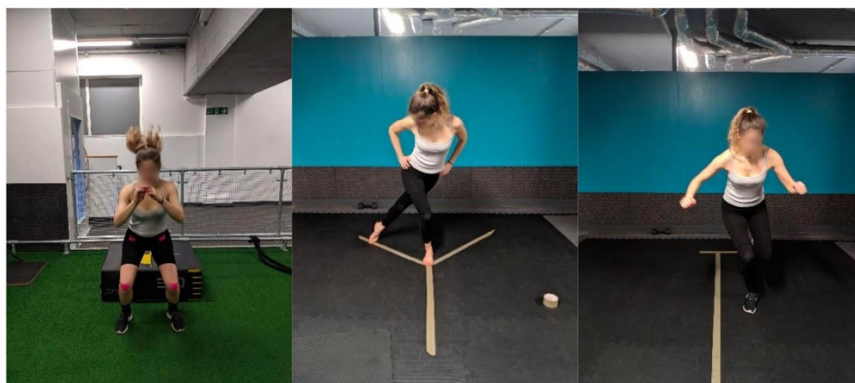
METHODS

An observational case control study design was undertaken. In the first stage, lower limb joint hypermobility was assessed in 122 Greek female gymnasts (11 – 15 years old) using the Lower Limb Assessment Scale.

In the second stage, participants were allocated into two groups a lower limb hypermobile (LLH) group and a non-lower limb hypermobile (NLLH) group.

Neuromuscular performance was assessed in a random sample of each group using the Lower Extremity Grading Score (LEGS). The LEGS assessment includes three functional tests; the Y-balance Test (YBT) measuring dynamic balance, the Drop Vertical Jump Test (DVJT) for jump-landing mechanics and lower limb control, and the Triple Crossover Hop for Distance Test (TXHD) for lower limb strength and control.

Comparisons of neuromuscular performance between gymnasts with and without lower limb joint hypermobility were performed using independent sample t-tests.



RESULTS

The prevalence of LLH was 32%. Gymnasts with lower limb hypermobility had significantly lower mean neuromuscular performance scores compared to those without hypermobility (p-value = 0.016).

Further analysis into the subcomponents, revealed that there was no difference in dynamic balance and lower limb strength and control measured by the Y-balance and Triple-Crossover Hop for Distance test respectively.

However, hypermobile gymnasts demonstrated significantly lower mean scores in the Drop Vertical Jump Test (p-value <0.001), suggesting that the hypermobile gymnasts demonstrated a poorer knee control during landing compared to those who were not hypermobile.

CONCLUSION

In conclusion, lower limb hypermobility is relatively common in young Greek gymnasts. Gymnasts in this study with LLH demonstrated poorer overall lower limb neuromuscular control, particularly during jump landing than the non-hypermobile gymnasts. Screening for LLH in gymnastics is recommended. Physiotherapists and coaches may use this information to develop training programmes to improve landing neuromuscular control in gymnasts with lower limb hypermobility.

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DECLARATIONS OF INTEREST

None