

ORIGINAL RESEARCH

THE COMPARISON OF THE LUMBAR MULTIFIDUS MUSCLES FUNCTION BETWEEN GYMNASTIC ATHLETES WITH SWAY-BACK POSTURE AND NORMAL POSTURE

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ABSTRACT

Background: The prevalence of sway back posture (SBP) is very high among elite gymnasts. This posture may be partly due to the improper function of lumbar multifidus muscles (LMM) as lumbar stabilizers muscles.

Purpose: The aim of this study was to compare the thicknesses of LMM measured at rest and during the contraction elicited during an arm lift between elite gymnasts with SBP and normal posture.

Study Design: Observational, descriptive, comparative

Methods: The participants consist of twenty gymnasts between the ages of 17 and 30 who had trained in gymnastics for more than ten years. They were assigned to two groups: SBP (n=10) and control (n=10). Posture analysis with grid paper and plumb line was performed for all subjects. The thickness of LMM on dominant side of spinal column was measured by a real-time ultrasound at five lumbar levels. The thickness of the LMM was measured both at rest and during the contraction elicited during an arm lift. The variation between the LMM thickness between the muscle at rest and muscle at the peak of contraction was regarded as LMM muscle function.

Result: The thickness of LMM was less in SBP group than the control group at all lumbar segments. The variation in LMM thickness between the state of rest and muscle contraction was significantly less in athletes with SBP than controls when compared at all levels of the lumbar spine ($p < 0.05$).

Conclusion: The function of LMM may be disturbed in athletes with SBP as demonstrated by decreased thicknesses of LMM found in gymnasts with SBP. Additionally, the thickness of the LMM as a strong anti-gravity and stabilizing muscle group was decreased during arm raising in gymnasts with SBP.

Level of Evidence: 3a

Key words: Gymnastics, lumbar multifidus, sway-back posture, ultrasound imaging

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