ABSTRACT

Background:

Field hockey's sustained forward-flexed posture imposes significant lumbar loading, with 56% of female players experiencing sport-related low back pain. This posture disrupts gluteal function, alters pelvic mechanics, and compromises neural mobility — collectively impairing high-velocity techniques such as the drag flick and drive through reduced neuromuscular coordination and power output. Neurodynamic mobilization has demonstrated superiority over static stretching in restoring neural mobility and enhancing athletic performance. However, no studies have examined its application in female field hockey players, warranting targeted investigation.

Methodology:

This single-blind, parallel-group, superiority randomized controlled trial (RCT) compared a 6-week protocol-based neurodynamic mobilization program combined with standard field hockey training against standard training alone in competitive female field hockey players aged 18–30 years. A total of 68 participants were recruited from club, state, and national levels and randomized 1:1 using permuted block randomization stratified by age and competition level. The experimental group (n = 34) received supervised neurodynamic mobilization (3 sessions/week, 6 weeks, 18 total sessions) targeting upper and lower limb neural pathways alongside regular training. The control group (n = 34) continued standard training supplemented with three non-therapeutic education sessions. Outcome assessors and data analysts were blinded to group allocation. Primary outcomes - drag flick velocity and drive velocity - were assessed at baseline (Week 0) and post-intervention (Week 6) using calibrated radar gun systems. Secondary outcomes included shot accuracy, thoracic rotational range of motion (ROM), hip flexion and extension ROM, Upper and Lower Limb Neurodynamic Test (ULNT/LLNT) responses, and serum inflammatory biomarkers (hs-CRP and IL-6). The study was conducted in accordance with CONSORT 2025 reporting guidelines.

Results:

All 68 participants completed the 6-week intervention (100% retention rate). No adverse events were recorded. Statistically significant improvements were observed across all primary and secondary outcomes following the neurodynamic mobilization protocol. Shot velocity improved from a pre-intervention mean of 76.09 m/s to 83.31 m/s (mean difference = +7.22

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