

氣墊式膝支架對膝關節在不同動作時的生物力學影響

Effects of air cushion brace on biomechanics of knee joint during different movements

黃玫華¹ 洪維憲*¹ 王慧如¹ 陳奎汝¹ 賴穎良¹

¹ 中國醫藥大學運動醫學系 運動醫學系 台中市北區學士路 91 號

摘要- 本研究目的在測試氣墊式膝支架對膝關節在不同動作時的生物力學影響。本研究延攬 6 位健康的受測者，隨機安排氣墊式支架或一般型支架，完成下蹲及急停跳躍動作。使用儀器包括三維動作分析系統 (Vicon 512) 與攝影機，結合二塊測力板同步收集參數，包括下滑度、膝關節活動角度、力板反作用力。結果顯示氣墊式膝支架比一般膝支架有較小的下滑度、膝關節內，外翻角度、及在垂直跳躍著地時有較小的地板反作用力($p < 0.05$)。結論：氣墊式膝支架能降低支架下滑，減少膝關節內、外翻，而且能在跳躍著地時自然地屈曲較大的膝關節達到緩衝的效果，進而降低關節的負荷。

關鍵字：膝關節、氣墊式支架、前十字韌帶

Abstract- The purpose of this study was to examine the effects of air cushion brace on biomechanics of knee joint during different movements. The study recruited six healthy subjects, randomly arranged air-cushion or typical knee brace to complete squatting and vertical jumping movements. Instrumentation was included 3D motion analysis system and 6 cameras, combining two force plates to collect biomechanical parameters, including migration, knee joint angles, ground reaction forces (GRFs). Results showed air-cushioned knee brace has lower migration, knee varus and valgus angles, and vertical GRF than those of typical knee brace ($p < 0.05$). Conclusion, air-cushioned knee brace can reduce the migration and the varus and valgus angles of knee joint, The naturally larger knee flexion cushion GRF impact during landing, thereby reducing knee joint loadings .

Keywords: Knee joint, Air cushion brace, Anterior cruciate ligament