投稿範例

**以下肢等長肌力檢測驗證雙腳於不同時間點發力率之信度**

陳廷威1\*、江杰穎2

1國立體育大學競技與教練科學研究所

2國立體育大學技擊運動技術學系

**摘要**

**緒論**：發力率代表運動員下肢快速產生力量的能力，良好的發力率或許能讓運動員在比賽中有較佳的啟動速度。本研究旨在驗證進行下肢雙側等長肌力檢測左、右腳之峰值力量及不同時間點發力率之檢測信度。**方法**：12名大專一級男子籃球選手 (年齡：20.65 ± 1.37歲; 身高：183.41 ± 8.91公分; 體重：84.65 ± 13.45公斤) 進行等長中段上拉檢測 (isometric mid-thigh pull, IMTP)。在標準化熱身後，受試者進入客製化的肌力檢測架，以關節量角器將膝關節與髖關節角度固定以利進行等長肌力測試，並在此姿勢下聽從檢測人員之口令，以最快速且最大努力向下推蹬持續至少五秒，同時使用PASCO測力板組收取左、右腳產生之地面反作用力 (ground reaction force, GRF) 進行後續分析，分別計算左、右腳RFD在0-150-200-250毫秒之數值，以及PF進行統計考驗，每位受試者雙腳分別進行兩次測試。統計方式以組內相關係數及變異係數做為信度判斷依據，信度可接受標準訂為ICC>.85，CV<10%。**結果：**左、右腳各項數值之ICC皆達接受標準(ICC=.862~.986)，CV部分除右腳之RFD於150毫秒之數值(CV=10.31%)外，其餘皆達可接受範圍(CV=2.7~7.49%)。**結論：**以IMTP測驗下肢雙側等長肌力，除了右腳在150毫秒之RFD外其餘參數之檢測信度皆達到統計上可接受之標準。透過分析IMTP檢測所得之數據可做為運動員檢視其左、右腳肌力特質之方式，或許能夠提供未來研究更具時間效率的檢測方式。

**關鍵詞：**峰值力量、等長中段上拉、地面反作用力

通訊作者：陳廷威

電子信箱：1090318@ntsu.edu.tw

投稿範例

**Reliability of Bilateral Rate of Forces Development at Specific Time Frame During an Isometric Mid-Thigh Pull Test**

Ting-Wei Chen1\*, Chieh-Ying Chiang2

1 Institute of Athletics and Coaching Science, National Taiwan Sport University, Taoyuan, Taiwan

2 Department of Sport Training Science-Combats, National Taiwan Sport University, Taoyuan, Taiwan

**Abstract**

 **Introduction:** The rate of force development (RFD) represents the ability to rapidly develop muscular force. Higher RFDs have been directly linked with better sport performances. The study aims to verify the reliability of the peak force (PF) and RFD at specific time frame of the left and right limb with the isometric mid-thigh pull test. **Methods:** Twelve Division 1 collegiate male basketball players (age: 20.65 ± 1.37 years; height: 183.41 ± 8.91 cm; body mass: 84.65 ± 13.45 kg) performed isometric mid-thigh pull (IMTP) test. After a standardized warm-up, the test was conducted with a custom-built power rack with fixed hip and knee angle, subjects were instructed to push their feet down into the force plates with maximum effort as quickly as possible. PASCO force plates were used to collect the ground reaction force (GRF) of the left and right limb for subsequent analysis. Measures of RFD at 0-150-200-250 milliseconds and PF were taken forward for statistical analyses. Every subject performed two trials for each limb. An intraclass correlation coefficient (ICC) and the coefficient of variation (CV) was used to assess reliability. Standard of ICC>.85 and CV<10% was set to be considered acceptable. **Results:** The ICC and CV values ​​of both the left and right limb were found to be acceptable, but not for the RFD of the right limb at 150 milliseconds. **Conclusion:** All variables of both lower limbs reached statistically acceptable standards except for the RFD of the right limb at 150 milliseconds. Data obtained from IMTP testing can be used as a reliable method for athletes to explore muscle strength characteristics of their left and right limb, and could serve as a more time-efficient testing method for future research.

**Key words:** peak force, isometric mid-thigh pull, ground reaction force

Corresponding author: Ting-Wei Chen

E-mail: 1090318@ntsu.edu.tw