

Test-retest reliability of forward, medial and rotational single-leg hop tests

Bart Dingenen¹, Alli Gokeler²

¹ Rehabilitation Research Centre, Biomedical Research Institute, Faculty of Medicine and Life Sciences, UHasselt, Agoralaan Gebouw A, 3590 Diepenbeek, Belgium.

² University of Groningen, University Medical Center Groningen, Center for Human Movement Sciences, Antonius Deusinglaan 1, 9713 AV Groningen, The Netherlands.



Introduction

Hop tests are mostly performed in the sagittal plane to evaluate functional performance during the return to sport decision-making process. However, athletes participating in pivoting sports have to move in multiple directions. The aim of this study was to examine the test-retest reliability of single-leg hop tests in the sagittal, frontal and transversal plane of motion.

Materials and Methods

Sixteen recreational athletes (8 females, 8 males; 22.4 ± 1.9 years) participated in the study. All athletes were tested twice (one-week interval) and performed the single hop for distance (SH), triple hop for distance (TH), triple medial side hop for distance (TMSH) and 90° medial rotation hop for distance (MRH) (Figure 1). The absolute hop distances for both legs were measured (cm). The maximum distance of 3 repetitions was the outcome measure. Intraclass correlation coefficients (ICC's), standard errors of measurement (SEM) and smallest detectable differences (SDD) were calculated.

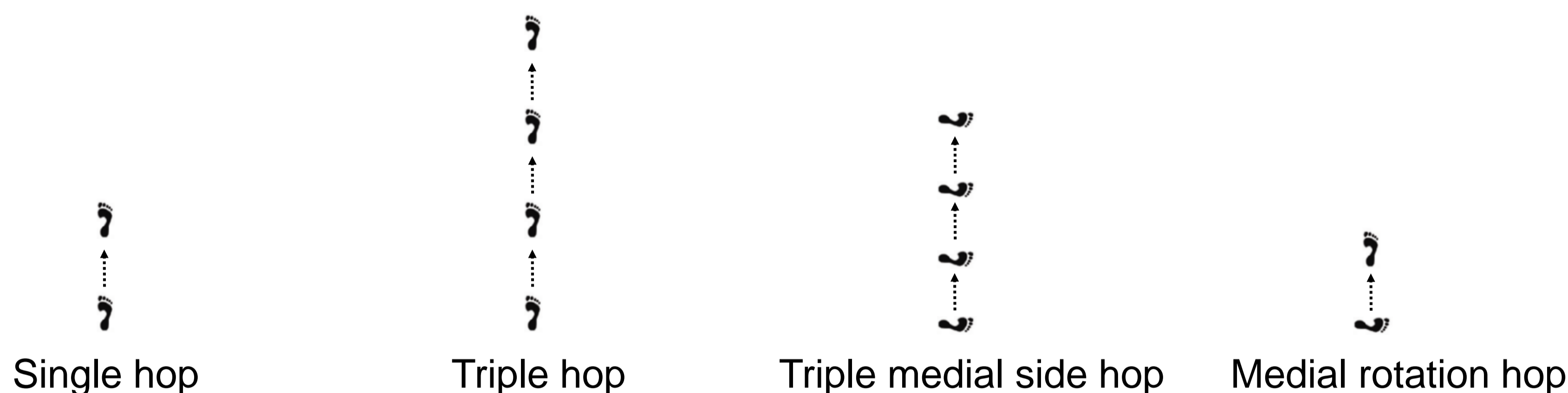


Figure 1. Graphical illustration of the single-leg hop tests.

Results

The ICC's ranged between 0.93-0.98. The SEM for SH, TH, TMSH and MRH were respectively 5.7-7.1 cm, 14.1-16.3 cm, 12.0-15.4 cm and 5.9-7.0 cm (3-4% of the mean of the group). The SDD for SH, TH, TMSH and MRH were respectively 15.7-19.6 cm, 39.1-45.1 cm, 33.3-42.7 cm and 16.4-19.5 cm (7-11% of the mean of the group) (Table 1).

Table 1. Test-retest reliability of hop tests.

DOMINANT LEG	Absolute difference between measures (cm) (mean (SD))	ICC _{2,2} (95% CI)	SEM (cm)	SDD (cm)
Single leg hop for distance	10.0 (10.1)	0.94 (0.83 – 0.98)	7.1	19.6
Triple hop for distance	21.3 (19.2)	0.97 (0.92 – 0.99)	14.1	39.1
Triple medial side hop for distance	20.0 (13.6)	0.98 (0.94 – 0.99)	12.0	33.3
Medial rotation hop for distance	9.1 (7.6)	0.95 (0.84 – 0.98)	5.9	16.4
NON-DOMINANT LEG	Absolute difference between measures (cm) (mean (SD))	ICC _{2,2} (95% CI)	SEM (cm)	SDD (cm)
Single leg hop for distance	8.6 (7.6)	0.96 (0.90 – 0.99)	5.7	15.7
Triple hop for distance	27.4 (18.1)	0.96 (0.89 – 0.99)	16.3	45.1
Triple medial side hop for distance	24.5 (19.8)	0.97 (0.90 – 0.99)	15.4	42.7
Medial rotation hop for distance	10.4 (9.4)	0.93 (0.80 – 0.98)	7.0	19.5

ICC: intraclass correlation coefficients; CI: confidence interval; SEM: standard error of measurement; SDD: smallest detectable difference.

Conclusion

The results of the current study showed excellent test-retest reliability of forward, medial and rotational hop tests. This allows clinicians to make informed interpretations of changes in hop test distances when retesting individual athletes across the return to sport process.

Corresponding author: bart.dingenen@uhasselt.be