Physical Therapy Visit Utilization is Not Associated with Hop Test Performance After Anterior Cruciate Ligament Reconstruction in Pediatric and Adolescent Athletes: A Multicenter Study

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INTRODUCTION: The relationship between physical therapy (PT) visit utilization and performance during single-legged hop testing after anterior cruciate ligament reconstruction (ACLR) in young patients is unclear. The purpose of this study was to examine the effect of PT utilization on hop testing performance in pediatric and adolescent patients after ACLR.

METHODS: A retrospective review of patients who underwent primary ACLR between 2013 and 2019 at 5 institutions was conducted. All patients followed a structured rehabilitation protocol as directed by the treating institution and completed a return to sport (RTS) test which included single-legged hop testing. PT frequency was assessed both overall and by time period (first 6 weeks, week 7-month 3, 3-6 months, and 6-12 months). PT visits were recorded up until the time of hop testing. To account for variability, the average number of visits attended per week during the observed time was calculated for each patient. The effect of PT visit rate on the odds of passing a hop test was assessed using multivariable logistic regression controlling for time to test, age, sex, and insurance status. Passing was defined as achieving a limb symmetry index (LSI) ≥ 90% on all available tests (single hop, triple hop, crossover hop, and timed hop, if performed), as well as passing just the single hop test. The primary predictor of interest included the average rate of PT visits at the time of hop test (≥1 visit per week vs. <1 visit per week).

RESULTS: 289 patients were identified (mean age, 15.7 ± 1.9 years). The mean time from surgery to the first PT visit was 0.36 ± 0.24 months. RTS testing was performed at a mean of 8.0 ± 1.9 months. Patients averaged 0.98 ± 0.38 visits per week until the RTS test. Mean LSIs for the single hop, triple hop, crossover hop, and timed hop were 96.3 ± 8.2, 97.1 ± 6.5, 98.5 ± 7.8, and 98.2 ± 7.4, respectively. 68.9% of patients passed all performed test; 85.5% passed the single hop test. The weekly rate of PT visits had no statistically significant effect on the odds of passing all performed hop tests (OR, 0.98; 95% CI, 0.56-1.71) or the single hop test (OR, 1.05; 95% CI, 0.51-2.18). Furthermore, the distribution of PT visits did not affect hop testing performance (Table 1).

DISCUSSION AND CONCLUSION:

The rate and distribution of PT visit utilization was not associated with hop testing performance in pediatric and adolescent patients after ACLR.

Table 1. Adjusted Odds Ratios (95% CI) for Passing Hop Test (All Performed and Single Hop Only), by PT Weekly Visit Rate During 1st 6 weeks, 7 weeks to 3 months, After 3 Months

	Adjusted Odds Ratio* 95% CI	p-value
All Hop Tests Performed		
Time Period		
First 6 weeks	1.20 (0.67 to 2.14)	0.5423
Week 7 – Month 3	1.66 (0.85 to 3.25)	0.1384
After Month 3	0.72 (0.36 to 1.44)	0.3470
Single Hop Test		
Time Period		
First 6 weeks	0.60 (0.28 to 1.28)	0.1876
Week 7 – Month 3	1.40 (0.60 to 3.29)	0.4403
After Month 3	1.39 (0.55 to 3.54)	0.4855

PT, physical therapy
*Fully adjusted model includes time to hop test as well as all predictors (visit frequency, insurance, sex, and age group) and site as a random effect; Odds Ratio shows effect of a 1 unit increase in weekly visit rate for given time period
**Average number of visits per week is calculated as total # of visits/weeks during specified period