The Effect of Short Term Single-Leg Balance Exercises on Balance Scores of Female Collegiate Athletes

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ABSTRACT

The correlation of injury and poor balance ignited an interest to uncover what can be done to improve balance and decrease the chance of injury among athletes. Purpose: The purpose of this study was to test if a female collegiate athlete’s balance could be improved by implementing a three week, single leg (SL) balance program. Methods: All athletes performed a SL balance pretest on their right/left legs as well as a fall risk assessment using the Biodex SD. Three weeks from the date of their pretest, participants completed a posttest on the Biodex SD. Throughout the three weeks, the experimental group performed a balance program monitored by a student investigator to ensure completion and proper technique. Results: We utilized an analysis of variance (ANOVA), two-way repeated measures ANOVA, independent sample t-test, and paired t-tests. The findings in this research did not support our initial hypothesis. Conclusion: From the statistical analysis that we conducted we concluded that a three week single leg balance program does not improve a female collegiate athlete’s balance when measured by the BioDex SD. Key Words: Biodex SD, Balance, Single Leg, Female, Collegiate

BACKGROUND

❖ Findings suggest that the optimal training period for balance ~ 6 weeks. 1
❖ A greater increase in balance scores were recorded when there was a mix of strength and balance training. 2
❖ A poor balance score has been found to make an athlete 1.44 times more likely to sustain an injury in the regular season. 3
❖ Females are 1.4 times more likely to suffer from a serious injury (concussion, fracture, subluxation, dislocation, rupture/ear, or other-surgical repair), when compared to males. 4

METHODS

SUBJECTS

❖ University of Wisconsin-Eau Claire (Division 3): Cross Country, Track, Soccer, Volleyball, and Tennis Athletic Teams
❖ Female collegiate athletes
❖ 23 participants
❖ No current ongoing injuries
❖ All participants provided written informed consent as approved by the IRB for the University of Wisconsin-Eau Claire

SCREENING AND TESTING PROCEDURES

❖ Participants filled out a pre-approved questionnaire addressing their demography and past medical history.
❖ Randomly assigned to a control/experimental group; both groups completed a prebalance test on the Biodex SD
❖ Single leg stance test (on both legs) and the fall risk assessment
❖ Each participant was allowed one practice trial to familiarize themselves with the Biodex SD
❖ Scores were averaged by the Biodex SD using three trials
❖ Within the three week period, the subjects in the experimental group completed a single-leg balance exercise regimen.
❖ Three times a week under the supervision and instruction of a student investigator.
❖ Exercises include: the star excursion balance test (SEBT), bird dog, hip hike, single leg forward reach, and hop-hop-stick.
❖ Both experimental and control groups performed a post test for single leg stance and fall risk on the Biodex SD three weeks after their initial pre-test.

RESULTS

STATISTICAL ANALYSIS

In the beginning of our study we had a total of 23 participants that met the expectations needed to join our study. We concluded our research with 20 participants due to injury, commitment, and schedule conflicts. To analyze our measurements of pre and post-test, and control vs. experimental groups, we utilized an analysis of variance (ANOVA), two-way repeated measures ANOVA, independent sample t-test, and paired t-tests. Statistical analyses were performed using SPSS version 17.0 (SPSS Inc).

DATA

Table 1 presents the mean score across the control group/experimental group comparing pre and post tests and right vs left. A lower mean score represents better balance, a higher score represents a poor balance score. Standard deviation of each of the provided groups resembles the consistency of the scores. A lower SD does not conclude better balance. A higher SD concludes poor consistency across the trials.

SUMMARY AND CONCLUSIONS

❖ Increase in pre and post test mean balance scores of mediolateral test for the right limb, no group difference was found
❖ Decrease in mean scores for left limb in the control group, increase in balance scores for experimental in anterior-posterior balance ability
❖ A three week single leg balance program is not sufficient in increasing balance as measured by the Biodex SD

REFERENCES


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