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Straight Leg Raise Test: Influence of Lumbosant© and Assistant Examiner in Hip, Pelvis Tilt and Lumbar Lordosis

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Abstract: The passive straight leg raise (PSLR) test is widely used to assess hamstring extensibility. However, to accurately measure hamstring extensibility throughout PSLR, appropriate stabilization of the pelvis must be provided in order to minimize the possible influence of any compensatory movement in the scores reached. The main purpose of this study was to demonstrate the degree of influence of the Lumbosant© and an assistant examiner in hamstring extensibility in healthy young adults. A secondary objective was to verify the variability of the posterior pelvic tilt movement. Hamstring muscle extensibility was measured using the traditional (only an examiner) and new (using a low-back protection support Lumbosant© and two trained [principal and assistant] examiners) PSLR procedures. Correlation coefficients were expressed using r values, accompanying descriptors and 90% confidence intervals. Variance explained was expressed via the R^2 statistic. To examine possible differences, the Mann-Whitney U-test was conducted. Additionally, Cohen's d was calculated for all results, and the magnitudes of the effect were interpreted and statistical significance set at $p < 0.05$. A stepwise multiple regression analysis was performed to examine the relationship between scores and values. The final score that was determined with the new PSLR is significantly lower (13° approximately) than the one obtained through the traditional procedure (75.3 ± 14.4° vs. 89.2 ± 20.8°; d = −0.777 [moderate]). The data presented in this study suggest that the PSLR may overestimate hamstring extensibility unless lumbopelvic movement is controlled. Therefore, we recommend the use of Lumbosant© and an auxiliary examiner to obtain more accurate hamstring extensibility scores.

Keywords: flexibility; angular test; validity; angle assessment

to determine the involvement of several muscles in the tests used, an electromyography system could be implemented. Third, a small sample was used, but this is often something that cannot be overcome when X-ray assessment is used. Moreover, in the current study, the validity was examined only in a population of young, sedentary and healthy adults. Further studies in other populations with limited hamstring extensibility or pathology are, therefore, necessary.

5. Conclusions

During the execution of the PSLR test, a posterior pelvic tilt movement is always observed and its magnitude does not seem to be associated with the hamstring extensibility. Likewise, lumbar lordosis is always proportionally reduced to the degree of posterior pelvic tilt motion but this is not associated with the hamstring extensibility score. Lower back protection support may be an effective tool to reduce the pelvis tilt and to minimize the reduction in the lumbar lordosis observed during the PSLR test maneuver. The only sex-related differences were found in the hamstring extensibility measure obtained through the PSLR test, independently of the version (traditional and new). Therefore, the results of the current study suggest that the PSLR may overestimate the hamstring extensibility unless lumbopelvic movement is controlled. Therefore, we recommend the use of Lumbosant© and an auxiliary examiner to obtain more precise results.

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