

ABSTRACT

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Title:

A comparison of results between a Y-Balance Test and a Star Excursion Balance Test among professional floorball players

Objectives:

The aim of this thesis is to find a relation between the Y-Balance Test and the Star Excursion Balance Test among professional floorball players and simultaneously to evaluate a level of a dynamic postural stability among professional floorball players and afterwards to evaluate a risk level of a lower limb injury.

Methods:

This thesis is characterised by a non-experimental observational study. A research sample consisted of a deliberately selected group of professional floorball players $n = 60$, 30 men and 30 women in the age range from 18 to 33 years (the average age was 21.37 ± 3.63 years), who have actively played the highest senior competition in the Czech Republic at least for one year. Each proband complied certain criteria to be included into the study. The measurement was taken in the field in sports halls of the tested professional clubs. The dynamic postural stability was evaluated by the Y-Balance Test measured with the Y-Balance Test Kit device in three directions and the Star Excursion Balance Test with The MAT[®] in eight directions. The data, which were obtained by both test measurements, were subjected to statistical analysis. The results of both tests were evaluated by using three directions – anterior (ANT), posteromedial (PM) and posterolateral (PL), the data were normalized to the functional length of the lower limb and a composite score was calculated. The correlation of the results between those two tests was evaluated by Pearson's correlative coefficient [r]. Student's paired t-test was used for an evaluation of the data obtained between the dominant and the non-dominant lower limb, the healthy and the anamnesticly marked injured lower limb and the ipsilateral lower limb identical to the side holding a stick and the contralateral lower limb. A two-sample t-test was

used for a comparison of the results obtained between women and men and the level of statistical significance was set at $\alpha = 0.05$.

Results:

The established correlation between the Y-Balance Test and the Star Excursion Balance Test was evaluated according to Evans (1996) as moderately strong (composite score $r = 0.538$). The moderately strong correlation was found in the anterior direction (normalized distance $r = 0.518$) and in the posteromedial direction (normalized distance $r = 0.494$), while a weak correlation was found in the posterolateral direction (normalized distance $r = 0.390$). Statistically significant differences were not found when the established data were compared with the dominant and the non-dominant lower limb, neither by the Y-Balance Test (composite score $p = 0.367$), nor by the Star Excursion Test (composite score $p = 0.305$). Statistically significant differences were found in the anterior direction ($p = 0.034$) in the Y-Balance Test when comparing the data obtained by measuring with the healthy and the anamnesticly marked injured lower limb, differences were not found in the Star Excursion Balance Test (composite score $p = 0.036$). Statistically significant differences were not found neither in the Y-Balance Test (composite score $p = 0.247$), nor in the Star Excursion Balance Test (composite score $p = 0.754$), while comparing the ipsilateral lower limb identical with the side holding a stick and the contralateral lower limb. Statistically significant differences were found in the posteromedial direction ($p = 0.001$), in the posterolateral direction ($p = 0.001$) and the composite score ($p = 0.019$), while comparing the results obtained by measuring women and men. It was found, for finding out the level of the dynamic postural stability of floorball players, which is based on the achievement of a cut-off score of 94 % according to Plisky et al. (2006) in the composite score individually for both lower limbs, that the given score in the Y-Balance Test for women did not reach 6.7 % players with the right lower limb and 10 % players with the left lower limb. The given score in the same test for men did not reach 3.3 % players with the right lower limb and 10 % players with the left lower limb. This expresses a low risk level of injury for the lower limb. In the Star Excursion Balance test for women, the given score did not reach 40 % with the right lower limb and 33.3 % with the left lower limb; the given score for men did not reach 33 % with the right lower limb and 23.3 % with the left lower limb, which can be characterized as an increase level of a risk in comparison to the results of the Y-Balance Test. The differences of the longest experiments were more than 4 cm in all measured directions, it indicates an increase level of a risk of the lower limb injury. These differences were found at 46.7 % of probands in the anterior direction, at 48.3 % of probands in the

posteromedial direction and at 53.3 % of probands in the posterolateral direction in the Y-Balance Test. In the Star Excursion Balance Test, the differences were found at 51.7 % of probands in the anterior direction, at 55 % of probands in the posteromedial direction and at 56.7 % in the posterolateral direction.

Conclusion:

The aims of this thesis have been fulfilled. Three hypotheses were rejected and two hypotheses were confirmed on the basis of the evaluated data. A moderately strong correlative relation was found between the Y-Balance Test and the Star Excursion Balance Test. The Y-Balance Test and the Star Excursion Balance Test should not be interchanged and their results should not be interpreted as the same. The dynamic postural stability of professional floorball players was evaluated as average, in regard to the symmetry of the differences of achieved results for individual lower limbs. Statistically significant differences were not found among professional floorball players, neither between the results of the dominant and the non-dominant lower limb, nor between the results of the ipsilateral lower limb identical with the side holding a stick and the contralateral lower limb. Statistically significant differences were found in the anterior direction between the results of the anamnesticly marked injured lower limb and the healthy lower limb. Statistically significant differences between the achieved values of men and women were found in the posteromedial and posterolateral direction as well as the composite score. In further studies, it would be advisable to unify the measurement procedure, to increase a number of probands of various ages and performance categories. The recommendation from the results of this study is to include the assessment of the postural stability in the commonly used tests of floorball players not only in clubs, but also in the official tests of the Czech Floorball Association and to focus on the increasing dynamic postural stability in trainings for reducing the risk of the lower limb injury.

Keywords:

professional floorball, floorball testing, dynamic postural stability, dynamic balance, dynamic postural examination, the Y-Balance Test, Y-Balance Test Kit, the Star Excursion Balance Test, the MAT[®]