

Identifying risk of ACL injury in collegiate male rugby players across a single training year.

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Abstract

The purpose of this study is to examine collegiate male rugby players' susceptibility for sustaining an ACL injury over the course of an entire season using the biodex strength assessment, a standardized functional movement screen (FMS), and Y-balance test. Participants included five male collegiate rugby players who play in the back line ranging from age eighteen through twenty-three. Baseline testing was conducted during preseason training and re-assessed every four weeks throughout the entire season. Assessment measures remained the same throughout all testing trials, in addition to a subjective patient questionnaire. Following data collection, three out of the five participants showed deficiency of hamstring strength at higher speeds along with impaired functional movement. One participant dropped out of the study while another patient was considered an outlier in this study because they did not show a significant deficit to support the data trends. Still, the results of this study suggest that male rugby athletes are more susceptible to ACL tears at higher speeds of movement, like those frequently performed in competition regardless of where they were in their training seasons. Future research should be done containing a larger pool of participants, a longer time span, multiple variable groups, and consistent data collection.

Discussion & Future Research

After completion of the three testing sessions (Pre-season, mid season, and post season), the following conclusions were made. Out of the five participants, one dropped out, and another was deemed an outlier as this participant did not exhibit hamstring deficits or a low quadriceps to hamstring strength ratio. The remaining three athletes demonstrated deficits in hamstring strength (>10% symmetry deficits compared to the non-dominant limb) through multiple isokinetic testing speeds and average to poor functional movement scores. These results suggest that collegiate male rugby players are at higher risk of ACL injury, and preventative assessments such as the Biodex Strength Test, FMS and Y-Balance Test are appropriate testing measures to identify such risks. Further research on this subject would support the use of such assessments in preventing ACL injuries in collegiate athletics. Such research should include a bigger sample size, longer duration of testing, multiple sports from multiple universities, different age groups, and genders.

Y-Balance Test Results Table:

Y-Balance	Forward	Post Med	Post Lat	Forward	Post Med	Post Lat
Trial 1	55	86	91	56	83	89
Trial 2	58	91	97	53	91	92
Trial 3	53	87	93	50	87	94

FMS Results Table:

Y-Balance	Forward	Post Med	Post Lat	Forward	Post Med	Post Lat
Trial 1	63	108	115	57	94	115
Trial 2	65	97	82	66	97	114
Trial 3	66	102	113	70	99	115

Biodex Strength Test Data Table:

EXTENSION	FLEXION	EXTENSION	FLEXION
240 DEG/SEC	240 DEG/SEC	300 DEG/SEC	300 DEG/SEC
Stronger 7.5%	Deficit 11.7%	Stronger 6.7%	Stronger 12.1%

KOOS KNEE SURVEY Form:

Today's date: ___/___/___ Date of birth: ___/___/___

Name: _____

INSTRUCTIONS: This survey asks for your view about your knee. This information will help us keep track of how you feel about your knee and how well you are able to do your usual activities. Answer every question by ticking the appropriate box, only one box for each question. If you are unsure about how to answer a question, please give the best answer you can.

Symptoms
These questions should be answered thinking of your knee symptoms during the last week.

S1. Do you have swelling in your knee?
 Never Rarely Sometimes Often Always

S2. Do you feel grinding, hear clicking or any other type of noise when your knee moves?
 Never Rarely Sometimes Often Always

S3. Does your knee catch or hang up when moving?
 Never Rarely Sometimes Often Always

S4. Can you straighten your knee fully?
 Always Often Sometimes Rarely Never

S5. Can you bend your knee fully?
 Always Often Sometimes Rarely Never

Stiffness
The following questions concern the amount of joint stiffness you have experienced during the last week in your knee. Stiffness is a sensation of restriction or slowness in the ease with which you move your knee joint.

S6. How severe is your knee joint stiffness after first waking in the morning?
 None Mild Moderate Severe Extreme

S7. How severe is your knee stiffness after sitting, lying or resting later in the day?
 None Mild Moderate Severe Extreme

References

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3. Powden Cj, Dodds Tk, Gabriel Eh. the reliability of the star excursion balance test and lower quarter y-balance test in healthy adults: a systematic review. int j sports phys ther. 2019;14(5):683-694. Biodex. Performance Therapy. <http://www.performancetherapy.co/clinic/biodex/#:~:text=Biodex-,Biodex,impairments%20that%20cause%20functional%20limitations.>