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Comparison of three "acute:chronic" workload ratio methods to monitor professional rugby union players' workload as a function of positions during pre-season period

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INTRODUCTION:

The quantification of workload (WL) is based primarily on forwards and backs in rugby union (RU)1, necessitating a more refined division to clarify the function of each position. In addition, as a common method of analyzing data in team sports2, no scientific research has reported to quantify the variability of all acute chronic workload ratio (ACWR) models in pre-season training for RU. Therefore, this paper aims (i) to investigate the differences in external workload (EWL) of players at five positions after eight weeks, (ii) to compare the variations in ACWR for players at various positions, as well as (iii) to analyze the substitutability of the three ACWR approaches in professional RU players.

METHODS:

Fifty-seven professional RU players (25.07±4.82 years old) participated in 8-week pre-season training. They were divided into 5 groups : Tight 5 (T5), third-row (3R), number 9 (N9), center, third line defence (3L). During training sessions, ETL was monitored using wearable 10-Hz GPS (Vector X7, Catapult Sports®, Melbourne, Australia) to characterize WLs by total distance (TD), player load (PL), the number of accelerations and decelerations (ACC+DECnum > \pm 2.5 m/s²), the number of accelerations (ACCnum >2.5 m/s²), acceleration distance (AD > 2 m/s²), high-speed running (HSR >15 km/h), very high-speed running (VHSR >21 km/h), sprint running (SR >25 km/h) distance. Coupled/uncoupled rolling average and exponentially weighted moving averages was used to calculate ACWR. Statistical assessments were one-way and multi-way analysis of variance with Tukeys multiple comparisons test.

RESULTS:

Throughout the pre-season, the WL of the 3L was always higher than T5 on ACC+DECnum, ACCnum, AD, HSR, VHSR and SR (P 0.001). For both TD and PL value, the group of number 9 was the highest and significantly greater than that of forwards (T5 and 3R, P 0.001). When quantifying PL, AD and HSR, the three approaches for estimating ACWR are interchangeable. Furthermore, no matter what calculating method was utilized, the ACWR of the center of the backs had the maximum value.

CONCLUSION:

Tracking differences in positional WLs during pre-season allows coaches and training staff to evaluate player preparedness and organize future training sessions more individualized. In addition, ACWR is still a reliable and effective tool for evaluating WL, it is sufficient to use one of the three methods in some cases.

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