Most demanding passages in Basketball: A preliminary study

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HMatch demands | Basketball | Intensity

Headline

Recently there is a special interest for knowing about the most demanding passages (MDP) in competition. The MDP which are most valid or best reflect this reality come from the rolling average technique, which has been applied to Australian (3) or European (6) football and Rugby League (2). Depending on the time window chosen, from the shortest to the longest results in a decreasing magni-tude of the particular variable studied following the *power law* (4). Nevertheless, in basketball, the description of the most demanding passages has not been reported until now.

Aim

The purpose of this study is to examine MDP during official game in sub-elite basketball play-ers using micro-technology.

Methods

Athletes. Nine semi-professional male basketball players (Spanish basketball LEB league) took part in the study (mean ± SD age, 20.3 ± 2.1years; height, 201.9 ± 9.2 cm; weight, 93.7 ± 8.5 kg). They were all members of the same team competing at the second level, with a mean playing experience (federation level) of 2.5 years. All players were notified of the research design and its requirements, as well as the potential risks and benefits. They all provided their informed consent before the study commenced. The Ethics Committee of the University of the Basque Country gave its institutional approval for the study.

Methodology. One official match was monitored in the 2018-19 season. Two external variables were assessed: Total Distance (TD) and total Player Load (PL). Five different rolling average windows were used, 15, 30, 45, 60 and 90 seconds. Then, all values were relativized to minute of practice; meters per minute for TD and arbitrary units per minute for Player Load. The two external variable were obtained using ClearSky T6 local positioning system devices (Catapult Innovations), which enable movement patterns in sports to be monitored in a valid and reliable manner in indoor sports (5). Players were familiar with the technology used as it is used during training sessions.

Statistical Analysis. Data are presented with means, interquartile range, and minimum (Q1-1.5 SD) and maximum (Q3+1.5 SD) in Figures 1 and 2 for both total distance covered and Player Load, respectively. In ad-dition, effect sizes (ES) were also calculated to determine meaningful differences with magnitudes classified as (1): trivial (<0.2), small (>0.2-0.6), moderate (>0.6-1.2), large (>1.2-2.0), very large (>2.0-4.0) and extremely very large (>4.0).

Results

Figure 1 showed the distance covered (m·min-1) by players regarding rolling average windows selected. The magnitude of the differences were (Cohen'd, standard error and qualitative assessment): from 15 sec to 30 sec = -2.90 (0.67) and very large decrease; from 15 sec to 45, 60 and 90 sec = -4.94 (0.95), -5.84 (1.08), and -6.62 (1.20), respectively and extremely large decrease for all; from 30 sec to 45 sec and 60 sec = -2.68 (0.65) and -3.94 (0.81), and very large decrease for both; from 30 sec to 90 sec = -5.03 (0.96) and extremely large decrease; from 45 sec to 60 sec = -1.30 (0.52) and large de-crease, and from 45 sec to 90 sec = -2.61 (0.64), and very large decrease; finally, from 60 sec to 90 sec = -1.43 (0.53), and large decrease. Figure 2 shows the Player Load (AU·min-1) by regarding rolling average windows selected. The magnitude of the differences were (Cohen'd, standard error and qualitative assessment): from 15 sec to 30 sec = -1.86 (0.56) and large decrease; from 15 sec to 45 sec and 60 sec = -3.01 (0.69) and -3.51 (0.75), respectively, and very large decrease for both; from 15 sec to 90 sec

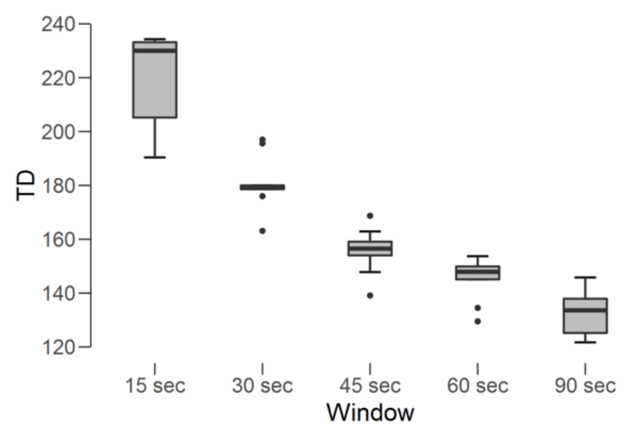

Fig. 1. Distance covered (in meters per minute) considering the time window 15, 30, 45, 60 and 90 seconds.

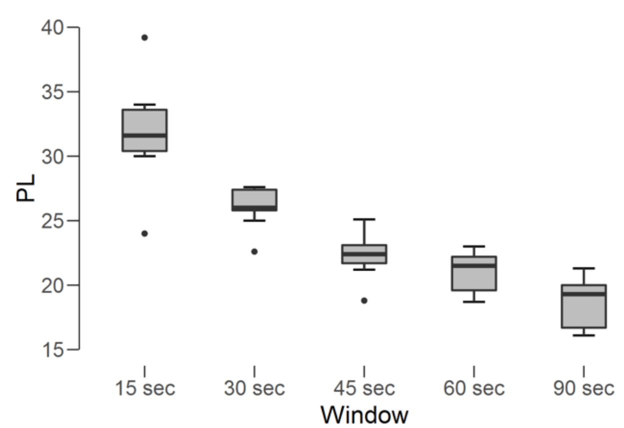

Fig. 2. Player Load (in arbitrary units per minute) considering the time window 15, 30, 45, 60 and 90 seconds.

= -4.10, 0.83), and extremely large decrease; from 30 sec to 45 sec and 60 sec = -2.13 (0.59) and -3.14 (0.70), and very large decrease for both; from 30 sec to 90 sec = -4.01 (0.82), and extremely large decrease; from 45 sec to 60 sec = -0.75 (0.49), and moderate decrease; and finally, from 45 sec to 90 sec and from 60 sec to 90 sec = -1.86 (0.56) and -1.29 (0.52), and large decrease for both.

Discussion

To our knowledge this is the first study in basketball to compare the most demanding periods regarding different duration of the time windows. The results showed that distance covered by players (7) or mechanical demand (8, 9) in some passages are by far more demanding that mean values which are usually considered when player's physical demands are evaluated. When studying game demands, it is important to consider all context-based variations that took part during a game, specially when attending the more demanding passages. Therefore, present data could help technical staff in designing and adapting the duration of training drills and those tasks who replicate the most demanding scenari-os of basketball games. These game-based adaptations may help training process with a more accurate load periodization within training units in basketball.

Practical Applications

- The present work suggests that the traditional analysis of game demands based on average val-ues is far from the most demanding events that occur during the games.
- These data may be used by coaches to propose training tasks that replicate the scenarios of max-imum demand that occur during matches

Limitations

- The biggest limitation of the study is that only one game was analysed. This is understood due to the impossibility of using micro-technology in high level official competitions

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