Introduction to player profiling

Introduction

We have previously described the demands of the sevens game for both men and women. We noted that conditioning for the game should take into account the increased overall running demands, which reflect high-intensity running training and an emphasis on reduced work-to-rest ratios. Further, the relative high engagement in longer sprinting at maximal efforts is an important component of fitness to develop. The requirement for both long and short sprinting traits for the game suggests that the faster player may have a distinct advantage in this sport.

While a number of studies have described the physical traits of the Rugby 15-a-side player, information on the physical profile of the seven’s player is less available. Here we aim to provide a physical and performance profile of the sevens player and compare this profile to that of the 15-a-side player. However, one of the practical difficulties that exist in comparing physical traits from one study to another is that different tests, instruments and protocols for assessing physical and physiological traits are used. This prevents accurate and precise comparisons as errors and differences in the way in which tests are conducted will likely impact on the results. Nevertheless, we will seek to compare like with like where possible, yet reminding the S&C coach that our comparison is often limited by our aforementioned drawbacks.

Aim

The module aims to describe the physical and physiological profile of players in the sevens and 15-a-side game.

Outcome

The S&C coach will be able to describe the different physical and physiological profiles of players participating in the sevens and 15-a-side game.

The S&C coach will be able to devise training related strategies to advance the physical characteristics of players partaking in sevens and 15-a-side Rugby Union matchplay.

Key terms

Maximum oxygen uptake:

This is the maximum amount of oxygen that an individual can consume during strenuous continuous exercise. Typically, top class middle distance track and field athletes and endurance athletes have high absolute and relative maximum oxygen uptakes. Often this measurement is taken as representative of endurance or aerobic fitness and is abbreviated to ml/kg/min representing millilitres per kilogramme of body weight.

Energy systems:

The three energy systems are the alactic, anaerobic and aerobic systems. The first two are the main energy systems taxed during intermittent activity sports such as Rugby Union. The aerobic system is important in the recovery process.
Demands of the games compared

We have previously noted that there is approximately a 45% greater relative running volume during the sevens game compared to the 15-a-side game. We also noted that as the level of performance increases from club to international level that the intensity of play also increases. This may imply that players at the highest level of the game will have high levels of endurance and different anthropometric or body composition profiles compared to the 15-a-side game players. Given that there is a greater running demand at higher intensities per minute of play in the sevens game, it could be argued that having less fat weight might enhance the player’s running or endurance capacity. Also, the ability to sprint fast and to maintain a high running speed over distances longer than those covered during the 15-a-side game suggest that greater speed levels and perhaps speed endurance exist in the seven’s players.

Profiling the players

The literature suggests that international rugby sevens backs are somewhat shorter and lighter than international 15-a-side backs (Duthie et al 2003). Also seven’s forwards are typically shorter and lighter than their 15-a-side counterparts (Fuller et al 2010). However, there is limited data on the physiological traits of sevens and 15-a-side players when compared using the same tests and test procedures. Recently though, Higham et al (2013) compared the physical traits of sevens and 15-a-side players. Their study did not investigate simultaneously players from both codes and they only assessed top Rugby seven’s men players. They then compared their results with those reported in the literature for 15-a-side players. We have noted the issue with such comparisons and accept the limitations stated. However, the study does allow us some degree of comparison between players of these two codes.

Specifically, we are interested in profiling the players from both codes in terms of speed, power, strength and running endurance. Such a comparison between high level players will allow us determine if physiological and performance differences exist between players of the two Rugby Union codes.

Players’ physical description

Higham et al (2013) completed anthropometric (body mass, height, sum of 7 skinfolds, lean-mass index) tests on 18 male international Rugby players. The authors reported that the international Rugby sevens players more closely resemble the height and body mass of international 15-a-side Rugby Union backs as opposed to 15-a-side forwards. They noted that the sevens players were similar to the backs group in several studies where a mean body-mass range of between 85 and 93 kg was noted and their height ranged between 1.80 and 1.83 m.

In summary, the authors reported that Rugby sevens players had anthropometric characteristics (body mass 89.7 ± 7.6 kg, height 1.83 ± 0.06 m, sum of 7 skinfolds 52.2 ± 11.5 mm; mean ± SD) which were reported as similar to those of backs of the 15-a-side international game.
Speed performance

Players were assessed in acceleration and speed over 40m. The players were required to complete a 40m sprint with split distances of 10, 20, and 30m indoors on a synthetic running track. An estimate of maximum velocity was obtained by subtracting the 30m split time from the 40m time and converting time to velocity (m/s). Momentum (kg/metre/second) over the last 10m of the sprint was calculated as the product of vmax and the player’s body mass (kg). The authors noted that Rugby sevens players in their study had similar sprint times over 10 and 20m and approximately 2% (0.07–0.12 s) faster times over 40m compared to previous reports of elite 15-a-side Rugby Union players.

They comment that Rugby sevens players were approximately 6% to 8% faster than elite forwards up to 20m but only approximately 2% faster than elite backs for 20 and 30m sprints.

Over 30 to 40m, 15-a-side forwards reached a maximum velocity of 8.4 ± 0.4 m/s, and backs, 9.2 ± 0.3 m/s, which is comparable to the 9.2 ± 0.4 m/s attained by players in the sevens study. The peak velocity achieved by players they note, during international Rugby sevens tournaments (8.5 ± 1.1 m/s) is in excess of 90% of the maximum velocity measured in the straight 40m sprint.

In summary, the authors note that in comparison with published data, the international level Rugby sevens players possess acceleration qualities similar to or exceeding those of elite Rugby Union players and maximum velocity values comparable to those of professional 15-a-side backs.

Power performance

The procedure used to assess vertical jump was as follows. A jump-height-measuring device was used. A minimum of 3 double-foot-stance counter-movement jumps with arm swing were performed until each player achieved his maximum jump height. Vertical jump height was calculated as the difference between maximum standing reach height and the highest point reached during the vertical jump. The typical error of the measurement for the vertical jump test was reported as 1.5cm.

With regards to jumping power the authors reported that the vertical jump height recorded for seven’s players (vertical jump 66 ± 7cm) was similar to, or better than, those of professional 15-a-side players.
Repeated sprint and intermittent endurance performance

The authors had players complete a 6 × 30m repeated sprint ability test. The test was performed indoors on a synthetic track with players starting 1.0m behind the electronic timing gates. The total time to complete the 6 sprints was recorded to the nearest 0.01 second. The typical error for this test is reported as 0.7%.

An incremental running test was used to assess endurance capacity. The test was completed on a motorised treadmill under standardised laboratory conditions to determine players’ maximal oxygen uptake.

As reported by Higham et al (2013), VO2max values of sevens players were however similar to or greater than that of international and professional players when reported relative to body mass. The moderate aerobic power of Rugby sevens players (54 ml/kg/min) suggests that it is only one of several fitness requirements in the international player’s fitness profile. The authors further noted that the players’ performance in the team sport-specific ‘Yo-Yo Intermittent Recovery 1 was approximately 36% higher than results of professional Rugby League players but approximately 7% less than in elite international soccer players. The authors note that the interpretation of repeated-sprint test results is typically protocol- and analysis-dependent. In agreement with previous observations, the cumulative time to complete six 30m sprints was more closely related to single sprint times than aerobic capacity. The authors note that repeated sprint ability is likely constrained by several physiological factors including aerobic capacity, anaerobic capacity, muscle excitability and neural drive, and muscle buffer capacity.

In summary, moderate levels of aerobic fitness were reported for sevens players and these levels are similar to, or greater than, those reported for the 15-a-side player.

Practical applications

The practical applications of this study as noted by the authors include the following:

- Training programmes for sevens players should develop all physical capacities.
- These capacities should focus on endurance, speed, acceleration, repeated sprint, and power.
- Based on the potential for competing demands, players training concurrently for both Rugby Union and Rugby sevens should prioritise their training programme according to specific anthropometric and fitness requirements and timing of competitive seasons.
- There is a need for players of all positions to achieve minimum performance standards for competitive success at the international level.
- Assessing an individual player’s strengths and weaknesses facilitates the prescription of an individualised training program.
- Regular physiological and anthropometric assessments are recommended to monitor players’ physical development progression.
- Finally, simple field-based tests may be employed to assess training adaptations and prescribe velocity thresholds for both training and performance monitoring in place of time-consuming and expensive laboratory-based tests.

A structured testing regimen conducted at various phases of the season (e.g. off-season, preseason, midseason) will assist in planning periodised training programmes and evaluating their effectiveness.
Summary

Higham and colleagues (2013) conclude that international Rugby sevens players require highly developed speed, power, and endurance to tolerate the demands of competition. The small between-players variability of characteristics in Rugby sevens players highlights the need for relatively uniform physical and performance standards in contrast with 15-a-side players.

References

