# Reliability and validity of the running anaerobic sprint test (RAST) in soccer players.

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**Background:** The running anaerobic sprint test (RAST) was developed in order to provide a field test which could be used to determine an individual's anaerobic power (Draper & Whyte, 1997: Peak Performance, 97(1), 3-5). Previous research has evaluated the use of the RAST with members of the armed forces and basketball teams (Abbasian et al., 2012: Research Journal of Recent Sciences, 1(3), 72-75; Zagatto et al., 2009: Journal of Strength and Conditioning Research, 23(6), 1820-1827) but due to its increased popularity and potential applicability within the sport of soccer it is important to assess its validity and reliability in this population also.

**Methods:** 23 male amateur soccer players (age 24   3 years, mass 75.4   5.9 kg, and height 180   5 cm) performed three testing sessions, all a minimum of 2 days and a maximum of 7 days apart. During two of the testing sessions participants completed the RAST and during the other session participants completed the Wingate anaerobic test (WAnT). The RAST test involved the completion of six 35m sprints performed on an AstroTurf pitch, with 10s rest in between. Time for each sprint was recorded using a Bower timing gate system with gates positioned 0.3m and 35.3m from the start line and rest time was recorded using a stop watch (see figure 1). The WAnT involved the participants cycling at maximum cadence on a Monark cycle ergometer for 30s against a resistance equivalent to 7.5% of their body mass. Relative reliability was assessed by intra-class correlation coefficient (ICC 3,1). Absolute reliability was expressed in absolute values using the standard error of the mean (SEM). Criterion validity was established with Pearson correlation coefficients.
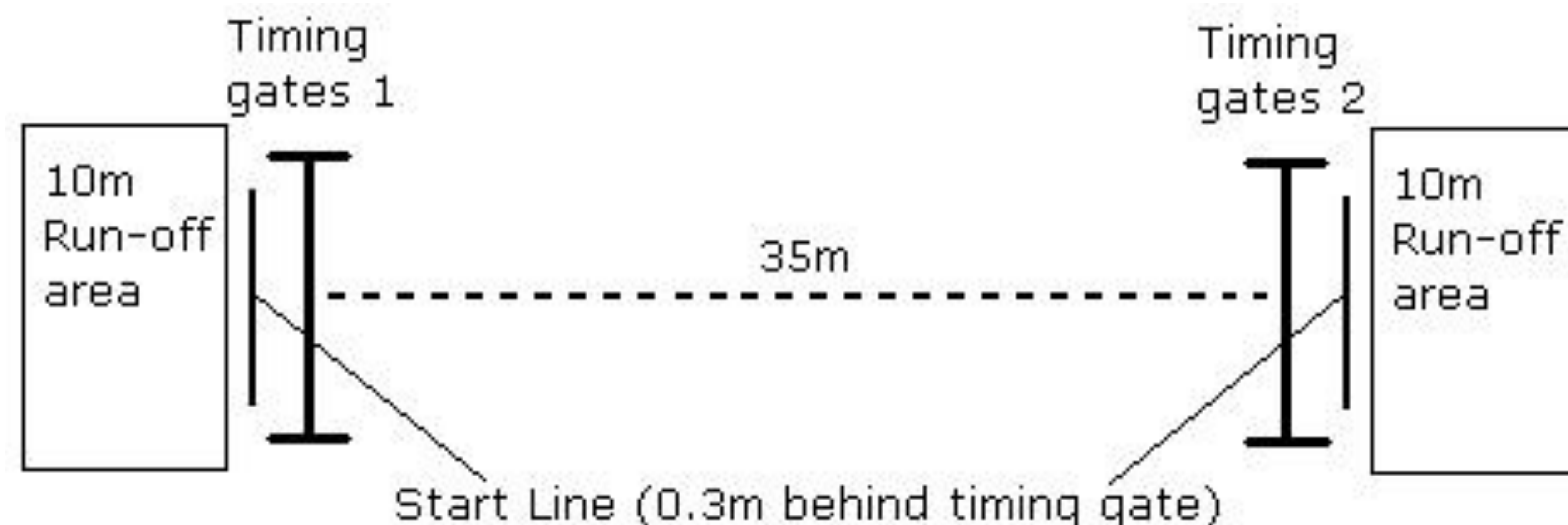
**Results:** The RAST showed strong relative reliability for average power, ICC = 0.89 (0.76 - 0.95; 95% CI, P=0.000) and fair to moderate relative reliability for peak power, ICC = 0.62 (0.29 - 0.82; 95% CI, P=0.001) (see figure 2 a & b for values). Assessment of absolute reliability of the RAST also highlighted differences for average power (SEM = 29.1, 23.4 - 38.8; 95% CI) and peak power measurements (SEM = 82.3, 66.3 - 109.8; 95% CI). When utilising an average from both of the RASTs, peak power in the RAST (781.3   120.7w) showed strong correlations (r=0.70, P=0.000) with peak power in the WAnT test (1000.1   112.7w). Moderate to strong correlations were also apparent for average power (r=0.60, P=0.002) with mean values of 590.9   85.0w for the RAST and 582.5   72.8w for the WAnT respectively (see figure 3 a &b).
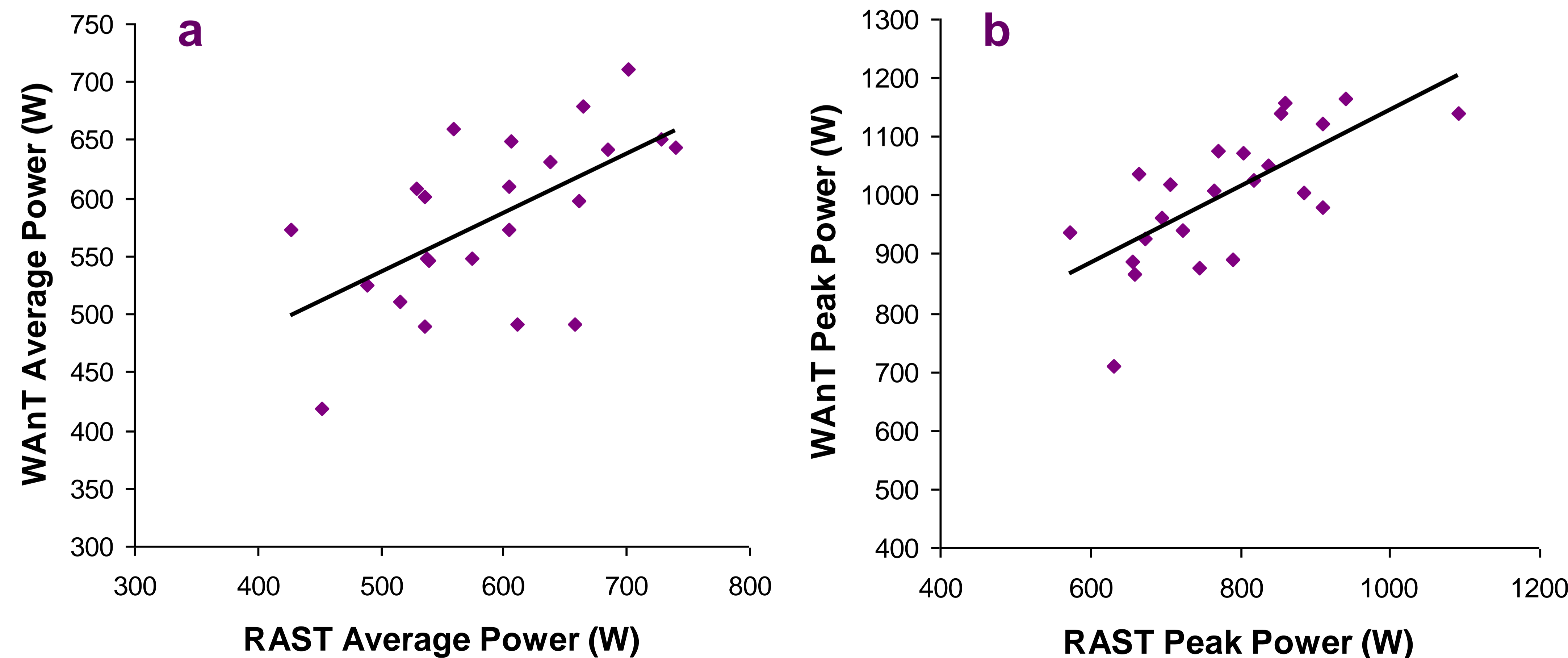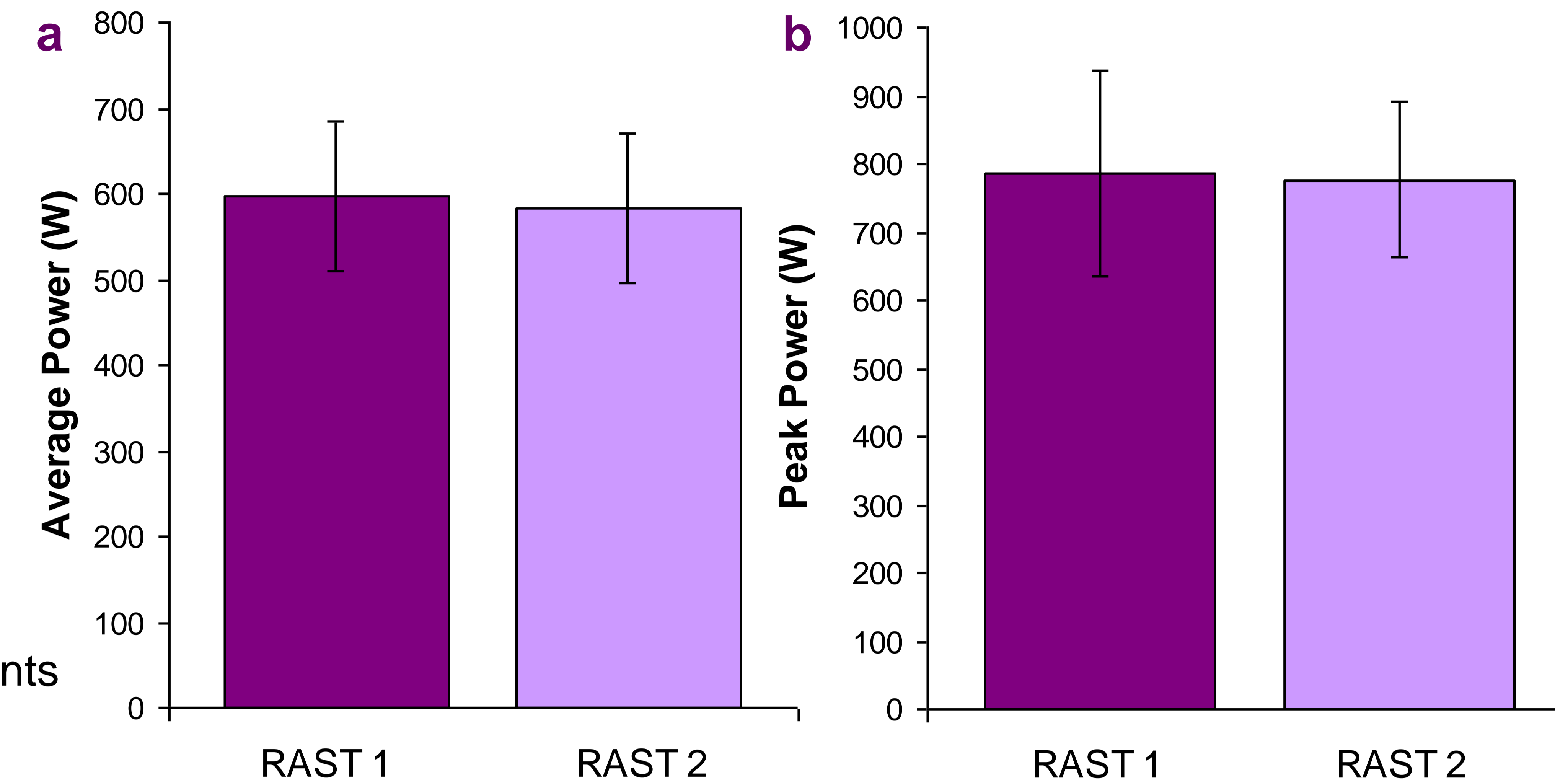
Figure 2: a) Average power and b) peak power recorded during the two repeated RASTs. Data are mean   SD.

**Conclusions:** The RAST test is a reliable, practicable field based test which can be used by coaches to estimate their soccer players' average anaerobic power. If true peak power measures are required this test is not ideal. Further investigation of this test's absolute reliability is required to determine its sensitivity to detect change.

Figure 1: Diagrammatical representation of RAST test set up.

Figure 3: Correlation between a) average power and b) peak power recorded in the RAST and WAnT.