



# THE DIFFERENCE IN AEROBIC CAPACITY AND ANAEROBIC POWER BETWEEN YOUNG MALE RECREATIONAL BASKETBALL AND SOCCER PLAYERS

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## Abstract

**INTRODUCTION:** Basketball and Soccer are two sports that are usually played recreationally that provide for an active lifestyle. At competitive levels of both sports athletes undergo different kinds of training in order to improve performance for longer periods of time but not recreationally. Basketball and soccer are sports which often require the use of both anaerobic and aerobic faculties of energy production in activities including but not limited to: dribbling, sprinting, passing, shooting, walking and jumping. The purpose of this research was to investigate the difference in aerobic capacity and anaerobic power between young male recreational basketball and soccer players. It was hypothesized that there would be no significant difference in aerobic capacity and anaerobic power between young male recreational basketball and soccer players.

**METHODS:** All tested subjects were male. A signed informed consent was given by each subject prior to testing. Each subject came in on 2 different days for testing. On the first day, demographic data was recorded, anthropomorphic measurements were taken and a polar heart rate monitor was attached to the chest of each subject and their heart rates monitored through test. A Bruce protocol  $VO_{2max}$  test was administered and  $VO_2$  was measured by a Sensormedics VMAX analyzer. RPE and BP were also monitored during testing. The subjects signaled exercise termination with a "thumbs down". On day 2 when the subjects came in they stretched their leg muscle for 2 minutes and warmed up on the ergocycle for 2 minutes before beginning the wingate cycle test while power measurements were taken. A T-test was used to investigate significant differences between both groups. Alpha level was set at 0.05

**RESULTS:** 4 basketball players(BB) and 4 soccer players(SC) volunteered for testing but only 3 of each group showed up for testing. The BB players mean age was  $22 \pm 1$  yrs while the SC players mean age was  $20 \pm 1$  yrs. The mean BMI for BB was  $24 \pm 2$  kg/m<sup>2</sup> and the mean BMI for SC was  $22 \pm 3$  kg/m<sup>2</sup> (p 0.5). The mean % body fat for BB was  $7.7 \pm 1.7$  % and the mean % body fat for SC was  $8.7 \pm 7.3$  % (p 0.8). The mean hours played per week of sport for BB was  $5.8 \pm 2.4$  and the mean hours played per week of sport for SC was  $4.6 \pm 1.5$  (p 0.5). The mean  $VO_{2max}$  for BB was  $43.4 \pm 4.3$  ml/kg/min while the mean  $VO_{2max}$  for SC was  $41.9 \pm 2.2$  ml/kg/min (p 0.63). The mean peak power per body mass for BB was  $13.2 \pm 1.5$  W/kg and the mean peak power per body mass for SC was  $14.7 \pm 0.7$  W/kg (p 0.2).

**CONCLUSION:** From the results of the study, it was concluded that there is no significant difference in anaerobic power and aerobic capacity between young male recreational soccer and basketball players

## Introduction And Purpose

Basketball and Soccer are two different popular sports often used for recreational exercise. They both exploit anaerobic potential in activities like dribbling, sprinting and shooting. They also require aerobic energy use in activities like running, walking and ball bouncing. The purpose of this study was to investigate the difference in aerobic capacity and anaerobic power between young, male recreational soccer and basketball players.

## Methods

**Subjects:** 6 out of 8 subjects who volunteered for the study completed the study. 3 basketball players (BB) and 3 soccer players (SC) completed the study. Below is a table of the mean demographic data:

	Age(yrs)	BMI (kg/m <sup>2</sup> )	% Body Fat	Hrs/week of play
Basketball	$22 \pm 1$	$23.5 \pm 1.8$	$7.7 \pm 1.7$	$5.8 \pm 2.8$
Soccer	$20 \pm 1$	$22.2 \pm 3.4$	$8.7 \pm 7.8$	$4.7 \pm 1.5$

## Methods (cont'd)

**Instrumentation:** Lange skinfold caliper, Sensormedics VMAX metabolic cart, lode bike with wingate software, polar heart rate monitor, manual sphygmomanometer

**Protocol:** Each subject came in on two different days. On the first day the subject's weight and height and %body fat was measured and recorded and then the subject was connected to a sensormedics cart and took a Bruce protocol, maximal oxygen consumption test while blood pressure and heart rate were monitored and recorded. On day 2 the subjects came in and did 2 minutes of stretching and then after sitting on a lode bike adjusted to their height preference, they warmed up for 2 minutes at 80rpms, no resistance and transitioned into test mode at maximal power output for 30s. Mean and peak power outputs were measured and recorded. The subjects cycled in recovery for 2 minutes.

**Statistical Analysis:** A student's t-test was used to evaluate the difference in test values between both groups with alpha level set at  $p \leq 0.05$ .

## Results

	AEROBIC DATA			ANAEROBIC DATA				
	$VO_{2max}$ (L/min)	$VO_{2max}$ (ml/kg/min)	$VO_{2max}$ FFW (ml/kg/min)	Peak Power (W)	Peak Power (W/kg)	Mean Power (W)	Mean Power (W/kg)	Fatigue Index (W/Sec)
BB	$3.3 \pm 0.3$	$43.4 \pm 4.3$	$46.9 \pm 4.7$	$1018 \pm 131$	$13.2 \pm 1.5$	$672 \pm 83$	$8.7 \pm 0.8$	$21.7 \pm 2.3$
SC	$3.1 \pm 0.6$	$41.9 \pm 2.2$	$45.4 \pm 2.1$	$1082 \pm 190$	$14.7 \pm 0.7$	$569 \pm 126$	$7.6 \pm 0.8$	$31.4 \pm 11.0$
p-value	0.6	0.6	0.6	0.65	0.19	0.3	0.19	0.21

(Average  $\pm$  SD)

## Results (cont'd)

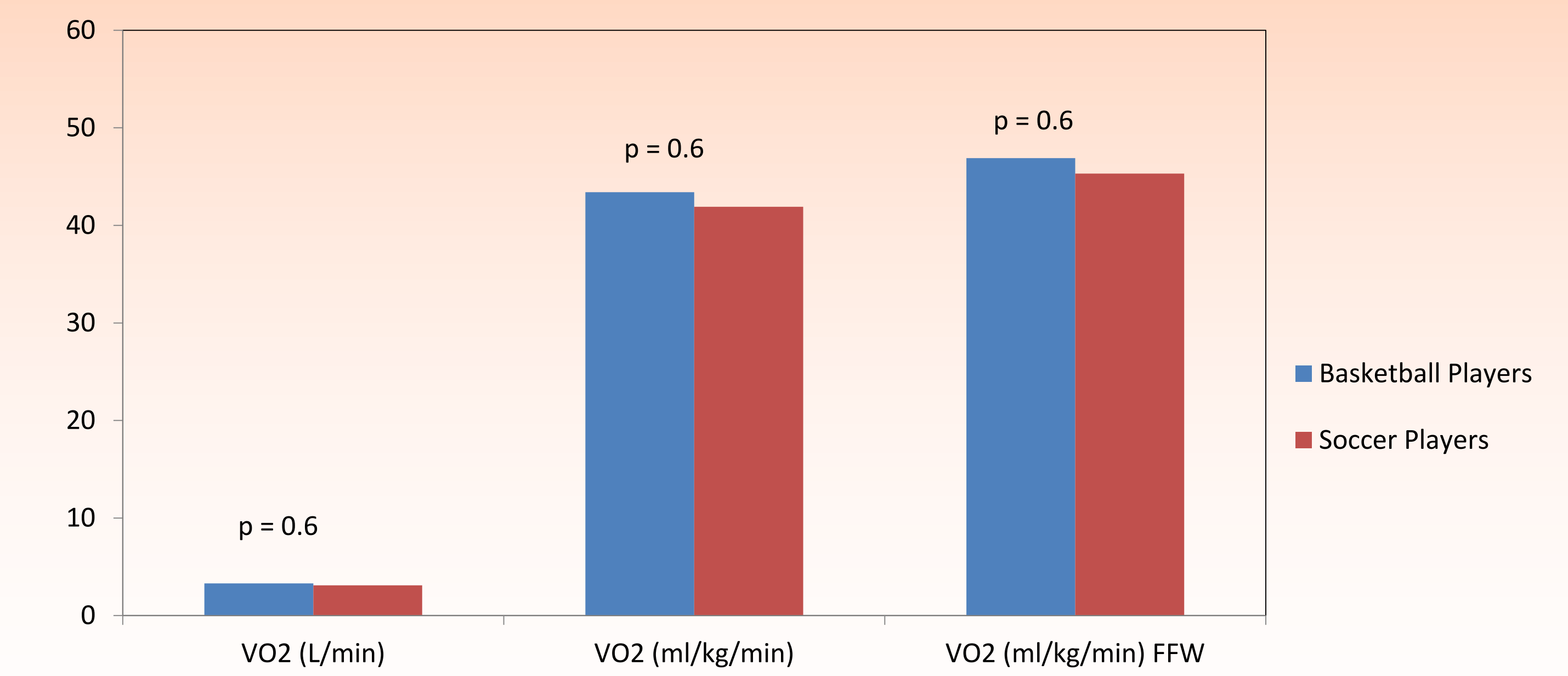


Fig 1: Aerobic Capacity Data

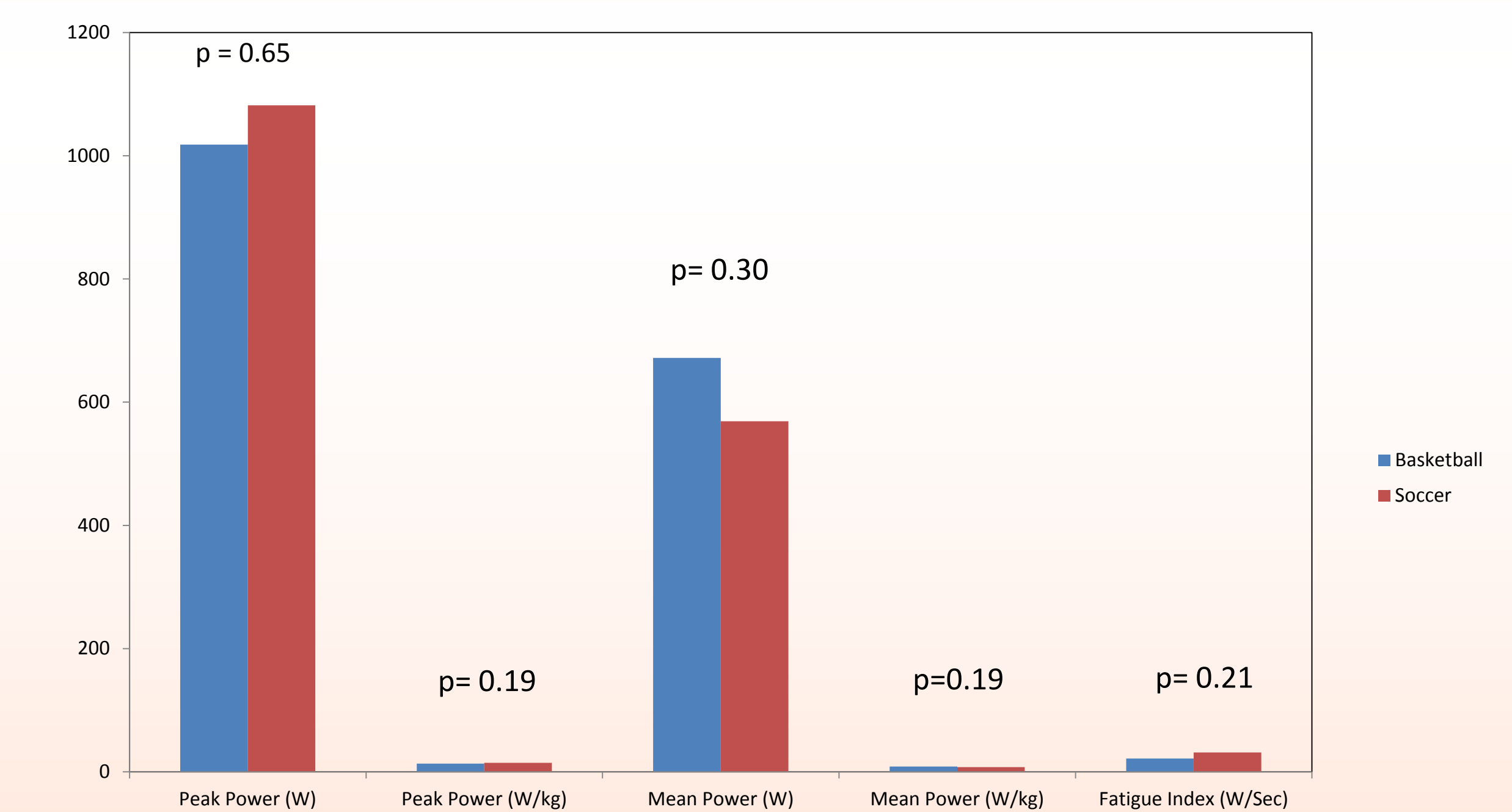


Fig 2: Anaerobic Data

## Conclusions

Based on the results of this study, there are no significant differences in aerobic capacity and anaerobic power between young male recreational soccer and basketball players. Both of these sports recreational would serve indiscriminately to increase activity level with enjoyment based on preference and can serve as combined aerobic and anaerobic exercise.