

THE RELATIONSHIP BETWEEN THE JIU JITSU ANAEROBIC PERFORMANCE TEST AND PHYSIOLOGICAL MARKERS IN TRAINED JIU JITSU PRACTITIONERS

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INTRODUCTION

Brazilian Jiu Jitsu (BJJ) consists of intense bouts mixed with short periods of rest and relies on both aerobic and anaerobic energy systems (1,2,4,5,7,8,10). The aerobic system allows the athlete to sustain higher levels of intensity throughout the five-to-ten-minute bout times set by the International Brazilian Jiu-Jitsu Federation and assists with recovery between bouts (3,5). The anaerobic system supports the short, fast, bursts of movement the athlete uses to perform take downs and sweeps (5,10,12). Previous studies have demonstrated a relationship between the Jiu Jitsu Anaerobic Performance Test (JJAPT) and anaerobic performance (6,7,9,10,11). The relationship between the JJAPT and aerobic performance has yet to be quantitatively defined. For the JJAPT to truly replicate Jiu Jitsu performance, the test would need to represent the aerobic component required in Jiu Jitsu.

PURPOSE

The purpose of this study was to determine if there is a relationship between the Jiu Jitsu Anaerobic Performance Test (JJAPT) and the physiological performance markers of maximal oxygen uptake (VO_{2max}) and ventilatory threshold (VT).

METHODS

Subjects

- Twenty-five BJJ athletes, (Males = 17 and Females = 8), with a minimum of one year training.
- Belt rank included: White n = 12, Blue n = 7, Purple n = 1, Brown n = 4, Black n = 1.

Test Protocol

- Each subject completed two test sessions separated by a minimum of 48 hrs.
 - One session consisted of gathering anthropometric data using the InBody 770 and a stadiometer followed by VO_{2max} testing on a treadmill using the Bruce protocol.
 - Subjects were fitted with a heart rate monitor (Polar), completed a five-minute warmup at a self-guided pace, then immediately completed the graded exercise protocol.
- A second session consisted of a five-minute JJAPT familiarization trial as a warmup, five minutes of rest, then the JJAPT (11).
 - Lifts were completed with a partner at or within 5% of subject's body mass.
 - Video recordings were used to ensure count accuracy.

Statistical Analysis

- Pearson correlation was used to determine the relationship between the JJAPT and VO_{2peak} and between the JJAPT and VT.
- Correlations for both dependent variables were run for the following groups: all subjects, male athletes, upper belted athletes, and white belted athletes.
- Correlation was considered significant at alpha of 0.05 (one tailed).
- All statistics were performed using SPSS 28 statistical analysis software (v. 28; SPSS Inc., Chicago, IL, USA).

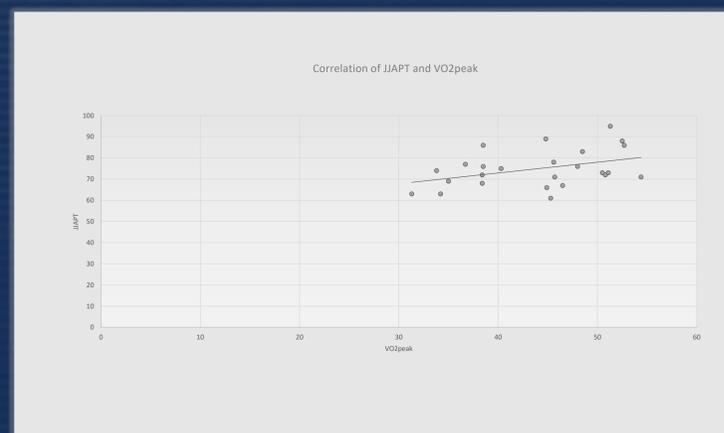
JJAPT (11)

The JJAPT consists of five rounds of the butterfly lift. It is a max effort test therefore subjects rounds complete as many lifts as possible in each 60 second round. All are separated by 45 seconds of rest. Each round of lifts is counted and tracked.

- Subject begins supine with knees at a 45° angle.
- Subject's feet are hooked under their partner who is seated with a straight vertebral column.
- Subject sits up into partner and completes a gable grip behind their partners back.
- Subject completes the butterfly lift.
- Subject returns partner to original seated position.
- Subject returns to supinated position.

RESULTS

- A significant moderate positive correlation was found between VO_{2peak} and the JJAPT ($r = 0.40$, $p = 0.025$) for all subjects.
- A significant moderate positive correlation was found for the male athletes between VO_{2peak} and the JJAPT ($r = 0.46$, $p = 0.031$).
- A significant moderate positive correlation was found for upper belt athletes (blue and above) between VO_{2peak} and the JJAPT ($r = 0.54$, $p = 0.029$).
- No significant correlation was found between VT and the JJAPT



CONCLUSION

In this study, by testing the JJAPT against aerobic measures, the moderate aerobic component of the JJAPT was found to be consistent with the aerobic energy system requirements for Jiu Jitsu. Therefore, it is suggested that this sport-specific assessment can be used as both a performance test and a monitoring tool for BJJ athletes.

PRACTICAL APPLICATIONS

Jiu Jitsu has been shown to have an anaerobic base with a moderate aerobic component (5,7,8,11). Previous research has established the reliability, and repeatability of the JJAPT as an anaerobic test (6,7,9,10,11). In this study, by testing the JJAPT against aerobic measures, the moderate aerobic component of the JJAPT was found to be consistent with the aerobic energy system requirements for Jiu Jitsu, adding value to the scope of the JJAPT. Therefore, based on the correlations with both anaerobic and aerobic fitness, and based on the reliability of the JJAPT, it is suggested that this sport-specific assessment can be used as both a performance test and a monitoring tool for BJJ athletes.

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