

# 青少年足球運動員不同有氧能力測驗成績與

## 最大攝氧量之相關研究

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### 摘要

**目的：**將三種不同有氧能力測驗實施於青少年足球運動員，而後比較各自成績與最大攝氧量的相關性，以探索最適合青少年足球運動員之有氧能力非實驗室測驗方式。**方法：**受試者為自願參與實驗的國立三重高中男子足球隊隊員 14 名，年齡  $17 \pm 1.2$  歲、身高  $172.4 \pm 6.4$  公分、體重  $65.8 \pm 6.3$  公斤，實驗期間為賽季後期所有受試者在一週內，分別完成漸增強度最大攝氧量測驗 ( $VO_{2max}$ )。於另兩週內，依次序於戶外跑道、草皮完成 12 分鐘 Cooper 測驗、節奏跑(Beep test) 和 Yo-Yo 2 級間歇測驗。取得三項戶外測驗成績後，使用皮爾遜積差相關係數分析法檢驗各成績與最大攝氧量之相關，找出最大相關的測驗。**結果：**三種戶外測驗都有高的再現性 (12 分鐘跑走  $ICC = .78$ ；節奏跑  $ICC = .71$ ；Yo-Yo 間歇測驗  $ICC = .69$ )，三項不同有氧能力測驗與受試者最大攝氧量之相關性：12 分鐘跑走有最大相關 ( $r = .60$ )，Yo-Yo 2 級間歇測驗次之 ( $r = .47$ )，節奏跑 beep test 最低 ( $r = .22$ )。**結論：**在評估青少年足球員賽季後期時的有氧能力，採用 12 分鐘跑走較能準確預估  $VO_{2max}$ ，節奏跑與 Yo-Yo 2 級間歇測驗兩者皆與最大攝氧量呈現低相關之原因，則需要後續更進一步的研究探討。

**關鍵詞：**有氧能力測驗、最大攝氧量、配速跑測驗、Yo-Yo 間歇測驗

# An Analytical Study of the Correlation between Different Aerobic Fitness Tests and $VO_{2max}$ in Youth Soccer Players

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## Abstract

**Purpose:** Three different aerobic fitness tests applied on youth soccer players. Performances of these three fitness tests were analyzed individually by comparing each correlation with the  $VO_{2max}$  value. We tried to discover the most valid and suitable field test for coaches to evaluate the aerobic capacity of youth soccer players.

**Methods:** 14 volunteers from National Sang Chung senior high school (age  $17 \pm 1.2$  year old ; height  $172.4 \pm 6.4$  cm ; weight  $65.8 \pm 6.3$  kg) took part in the study during post season, completed the maximal oxygen uptake test with Bruce protocol at the laboratory over the period of a week. Three field tests were completed: the 12 min Cooper test, the 20m multistage shuttle run test (the beep test) and the Yo-Yo intermittent recovery level 2 test, separately over a two-week period. The subjects' performances data were compared with  $VO_{2max}$  by conducting the Pearson Product Moment Correlation , to find the most closely related test. **Results:** Test-retest reproducibility of these three field tests was discovered (12 minscooper test, ICC = .78 ; beep test, ICC = .70 ; Yo-Yo IR2 test, ICC = .69). The highest correlation between 12 min Cooper test performance and  $VO_{2max}$  was found(  $r = .60$ ,  $p < .05$ ), subsequently the Yo-Yo IR2 test (  $r = .47$ ,  $p > .05$ ), and lastly the beep test (  $r = 0.22$ ,  $p > 0.05$ ). **Conclusion:** 12 min Cooper test has the ability to evaluate youth soccer player's aerobic capacity from post-season, and stronger accuracy of estimating  $VO_{2max}$ . The further researches about discovering the reason, for the lower correlation with  $VO_{2max}$  of both the Beep test and the Yo-Yo IR2 test, are needed.

**Key words:** aerobic fitness tests, maximal oxygen uptake, multistage shuttle run test, Yo-Yo intermittent recovery test