

A Validation Study to Evaluate the Accuracy of the Beep Test in Measuring Cardiopulmonary Endurance Using Maximum Oxygen Uptake (VO₂max) as the Gold Standard

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Cardio pulmonary exercise testing (CPET) is the “gold standard” test for measuring real time maximal oxygen uptake (VO₂max) in athletes. Beep test is a commonly used indirect field test in Sri Lankan sports settings. This study was designed to determine the validity of beep test against the CPET for measuring cardiovascular endurance. A cross sectional descriptive observational study was conducted by recruiting the rowers of the national pool of Sri Lanka [n = 16, male = 5 (68.8%) and female = 11(31.3%)], aged 24 – 34 years. Mean age of the study sample was 29.3 ± 3.1 years. Mean height, weight and BMI of the sample were 1.7 ± 4.6 m, 69.49 ± 8.95 Kg, 22.77 ± 2.31 Kgm-2 respectively. The mean VO₂max obtained from the CPET was 33.32 ± 6.69 mlKg-1min-1 for the total population with 33.64 ± 6.27 mlKg-1min-1 in males and 33.01 ± 8.35 mlKg-1min-1 in females. In the total sample, beep test significantly overestimated VO₂max by 15.62 ± 1.25 mlKg-1min-1, in males by 17.74 ± 0.43 mlKg-1min-1 and by 12.35 ± 1.39 mlKg-1min-1 in the females. Beep test significantly overestimated actual VO₂max by a percentage deviation in the total study population. The data were analysed using IBM Statistical Package for Social Science (SPSS) version 23 computer software. Kolmogorov-Smirnov test was used to determine the normality of data. Data were analyzed and described under the descriptive measures namely mean and standard deviation. Mann Whitney test was used to compare the variables between the male and female rowers. Nonparametric paired samples Wilcoxon Signed Rank and Spearman’s rank order correlation test was used.

Keywords: VO₂max gold standard, CPET, beep test