

Does training improve pulmonary functions of Sri Lankan cricketers?

Theme: Exercise Physiology & Nutrition

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Aims: To determine the status of the pulmonary functions amongst Sri Lankan division one club level cricketers in comparison to matched controls. Training programmes of cricketers are planned to enhance and maximise the performance. However optimal performance of Sri Lankan division one club level cricketers is not observed in the competitive arena despite regular training. Performance depends on the physical fitness and technical training. Although techniques are addressed by training programmes, the player's physical fitness may not be optimized.

Methodology: Sri Lankan division one club level cricketers (n = 30) were studied. Baseline data were collected by a questionnaire and clinical examination. Pulmonary functions were assessed by a Vitalograph spirometer. Results were compared with age, height, weight and gender matched controls (n= 30). Ethical approval for the study was granted by the Ethical Review committee of the Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka. Data were analyzed using SPSS version 16 statistical package using Students t- test.

Results: Inspiratory function as indicated by the Forced Inspiratory Vital Capacity (FIVC) (3.781+/- 0.65), Forced Vital Capacity (FVC) (3.93+/- 0.64) and Forced Expiratory Volume in 1st second (FEV₁) (3.56+/-0.43) were significantly higher amongst the cricketers (p< 0.05). The small air way function as determined by mid stream Forced Expiratory Flow (FEF_{25%-75%}) (4.12+/-0.79) of the cricketers was similar to the controls (p>0.05). The expiratory muscle efficiency as indicated by Peak Expiratory Flow Rate (PEFR) (553.18+/-72.55) and FEV₁/ FVC (89.24+/- 5.44) ratio was not statistically significantly different between the cricketers and the controls (p> 0.05).

Discussion: Better training should be associated with an optimal improvement of respiratory function; ie. Increasing the depth of breathing via high tidal volume and increased Vital Capacity¹. In order to achieve an optimal vital capacity (VC); while the Inspiratory Capacity (IC) is increased the Expiratory Reserve Volume (ERV) has to be proportionately lower level. For that the abdominal expiratory muscles will have to be act in there optimal strength. This will further cause the elevated intra-abdominal pressure (P_{ab}) and the diaphragm is lengthened at end-expiration enabling this muscle to operate near its optimal length for force generation during the ensuing inspiration potentially sparing the extra inspiratory muscles^{2,3,4}.

The results indicate that the respiratory efficiency of the cricketers had not optimally improved with training. Although the inspiratory capacity is improved our cricketer's expiratory efficiency is not significantly improved. Therefore at the end of the breathing cycle the ERV will be in high level. That will cause the suboptimal function of the diaphragm and the player will have to use the extra inspiratory muscles during the ensuing inspiration causing more energy expenditure.

Conclusion: The study concludes that training programmes for the club level cricketers must consist of exercise schedules to optimize the strength of respiratory muscles especially the abdominal expiratory muscles. This will achieve optimal pulmonary function amongst cricketers. Improvement of pulmonary function may in turn promote better performance of cricketers at competition⁴.

References:

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