

# Evaluate the change of %SpO2 (saturation percent oxygen) and heart rate at lactate threshold in male elite athletes during sport until exhaustion

**Hamid Tabatabaei, Ph.D.**

Department of Physical Education and Sport, University Azad of Tehran, IRAN

Member of Physical Assessment Center of N.O.A.I.R. IRAN

## Introduction

The purpose of this study was to evaluate the change of %SpO2 (saturation percent oxygen) and heart rate at lactate threshold in male elite athletes during sport until exhaustion. Also the relationship between %SpO2 and some physiologic factors such as blood lactate acid at the end of the test and the amount of oxygen used at lactate threshold was evaluated.

## Methods

The sportsman in our study were national team athlete in Canoeing, Tae kwan do, Wrestling, and Middle distance running with the average age of 22.29 years, average height of 179.73 and average weight of 81.55. After explained about test, each case got on the treadmill. Once the treadmill started, each subject started walking on it. After a one-minute for warm-up with the speed of 4 km/h, they started running with the speed of 8 km/h. after each minute, the speed increased by 1 km/h up to the time until the exhaustion. During the test, %SpO2 and heart rate were recorded prior to increase in speed by the "pulse oxymeter". Meanwhile, with used gas analyzer (K4b2) some respiratory factors such as the Vo2 at lactate threshold and after the end of test blood lactate acid were evaluated.

## Results

The data were collected in forms and were analyzed using SPSS statistical software (Pearson correlation coefficient and regression). The data revealed that there was no significant relationship between %SpO2 and heart rate at lactate threshold. Also, no relationship was detected between %SpO2 and either blood lactate acid at the end of test or Vo2 at lactate threshold. Finally, the athletes were divided into two groups of aerobic and anaerobic sports. The statistical analysis was done again and no significant correlation was observed between the above factors.

## Discussion/Conclusion

Regarding the low regression line and reverse correlation between %SpO2 and heart rate at lactate threshold, a partial relationship or pattern may be presented like what suggested in the table below. However, presenting a more accurate table needs great subjects.

%SpO2	94%-93%	92%-91%	90%-88%	87%-85%	84%-80%	79%-77%
Heart rate at threshold	138-146	147-149	150-154	155-158	159-163	164-166

## References:

- Mengelkoch, L.J., Martin, D., Lawler, J., : A review of the principles of pulse oximetry and accuracy of pulse oximeter estimates during exercise. *Physical therapy J.* 74(1), 40:49, Jan. 1994
- Peltonen, J.E., et al. : Arterial haemoglobin oxygen saturation is affected by submaximal running velocities in elite athletes. *Scandinavian J. Med. Sci. In Sports.*9 (5), 265:271, Oct. 1999
- Robert, D., Smith, D.J. : Erythropoietin concentration and arterial haemoglobin saturation with supramaximal exercise. *J. Sports Sci. London*, 17(6), 485:493, June 1999
- Sjodin, B., et al. : The physiological back ground on onset blood lactate accumulation(OBLA). In *proceedings of inter. symposium of sports Biology. Edited by P: V. Komi. Champaign, IL, 1982*