JSM

JOURNAL of SPORTS SCIENCE & MEDICINE

Journal homepage ISSN: 1303 - 2968

©Journal of Sports Science and Medicine (2013) 12 , 267 - 274

Research article

The Relationships Between Simulated Tennis Performance and Biomarkers for Nitric Oxide Synthesis

Tolga Akşit, Faruk Turgay, Emine Kutlay, Mehmet Z. Özkol, Faik Vural

Author Information Publish Date How to Cite

Email link to this article

ABSTRACT

Tennis performance requires a good aerobic endurance and recovering capacity. Nitric oxide (NO) is a gas which is not only a vasodilator and antioxidant but it also regulates the use of oxygen and glucose. The aim of this study was to examine the relationships between simulated tennis performance test (PT) and NOx (sum of nitrate+nitrite) levels and lactate elimination speed (LES). Twenty well trained male tennis players with game levels of ITN 4 (International Tennis Number) and lower (mean ± SD; age 22.9 ± 2.6 yrs; height 1.82 ± 0.06 m and mass 75.7 ± 8.0 kg) participated in the study. Participants performed three 4-min bouts and a 2-min continuous groundstroke against balls projected from a tennis ball machine at speeds of 50, 55, 62 and 70 $km \cdot h^{-1}$. After this exercise, subjects were given a 20 min passive rest. After each period and at during the recovery phase; plasma NOx, glucose (GLU) and lactate (LA) levels were determined. LES was calculated during passive recovery. GLU, LA and heart rate (HR) showed a linear increase in comparison to the values in the previous step while PT decreased significantly. Following each period NOx and glucose levels increased independently, but their decreasing rates in recovery phase were related ($r = 0.470$, $p < 0.05$). The successive increase in NOx and GLU parameters between the third and the forth periods was significant ($p < 0.05$). Only in the third period was there a significant relation between PT and NOx ($r = 0.494$; $p < 0.05$). In the present study, no significant relationship was found between PT and GLU, LA levels and LES. No

significant correlation was found between simulated tennis performance and blood NOx levels. However the addition of loads like those in the third period in tennis trainings can be beneficial for performance in trained tennis players. It is recommended that the relationships between tennis performance with NOx and GLU are studied during a real tennis match.

Key words: Blood lactate, heart rate, nitric oxide, stroke performance, tennis

Key Points

- In a sport like tennis which lasts 2-6 hours and has short rests, performance depends on the player' s capacity to perform the intensive exercise intermittently. Therefore, recovering potential is important in tennis.
- In none of the periods of this study were the expected (significant) relations observed of the athletes. Therefore, it can be claimed that LA increase, LA elimination and aerobic endurance do not play a significant role in the performance and the decrease in performance in this exercise model.