J Vet Clin Vol. 24, No. 2(Suppl.) October (2007)

Training effects of maximal treadmill exercise on the heart rate, blood lactate and some hematologic, biochemical parameters in Thoroughbred horses

Gui-cheol Choi, Young-woo Lee, Byung-sun Kim, Young-min Yun[1], Jongtae Cheong[1], Hwa-young Yoon[2], Kyoung-kap Lee[1*]

Veterinary Center, Korea Racing Association, Gwacheon, 427-711, Korea
[1]Department of Veterinary Medicine Cheju National University, Jeju 690-756, Korea
[2]College of Veterinary Medicine, Seoul National University, Seoul 151-742, Korea

Exercise testing to evaluate the physiological responses of athletic horses to exercise is a recent event in the assessment of equine performance with research performed both on the track and using a treadmill. The purpose of this paper was to study the training effect of maximal treadmill exercise on the heart rate, plasma lactate and some hematologic, biochemical parameters.

Six unraced Thoroughbred mares(7±2.3 yrs old) were used in this study and all horses were trained 5 days each week for 12 weeks through standardized incremental exercise using high speed treadmill. To evaluate the effect of training, all horses were measured to maximal heart rate during treadmill exercise, V-HR_{max} and blood examination including blood lactate concentrations before and after each training at the 4th, 8th and 12th weeks of the training period.

The results showed that V-HR_{max} increased significantly from 8.9±0.36 m/sec before training to each 9.9±0.32 m/sec, 10.1± 0.28 m/sec at the 8^{th} and 12^{th} week after training ($P<0.05$) and blood lactate concentration also decreased significantly from 9.1±1.33 mmol/ l before training to each 6.0±1.08 mmol/ l , 5.1±1.24 mmol/ l at the 8^{th} and 12^{th} week of training ($P<0.05$), It suggests that the training effect shows up in 8 weeks of training. And in the auxiliary examinations such as in the hematology, RBC, WBC, Hb and PCV increased significantly in the week of 8^{th} week ($P<0.05$) and recovered to the level before training in the 12^{th} week. And in the blood chemistry, total protein concentrations increased significantly in the week of 4^{th}, 8^{th} and 12^{th} week ($P<0.05$) and GOT and CPK increased significantly at 4^{th} week of training ($P<0.05$).

Conclusively, the changes of V-HR_{max}, blood lactate concentrations, RBC, Hb and PCV of the horses observed for 12 weeks of standardized incremental exercise using high speed treadmill well responded to their increased performance with significance especially at the 8th and 12th week of training.

* Corresponding Author: leekk@cheju.ac.kr