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during day 2 of the competition and comes back to the day 1 level in the following day ($P<0.05$). Additionally, both during gradation and elimination shootings, cortisol levels rise 15 min before the competition and come back to pre-competition levels during with half-time ($P<0.05$)

CONCLUSIONS: According to the data obtained, salivary cortisol level (1) increases on the most important day of competition (elimination), (2) increases immediately before competition-regardless of gradation or elimination, (3) decreases with the commencement of the competition. Hence, cortisol seems to be an important parameter needs to be assessed for stress screening and strategies development in sport branches like arching that poses mental and physical stress.

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The Effects of Exercise on Kidney Oxidant and Antioxidant Systems in Rats with Experimental Hyperthyroidism

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AIM: Hyperthyroidism is a hypermetabolic state accompanied by increased oxygen utilization, increased production of reactive oxygen species and consequentially measurable changes in antioxidative factors. Several studies have reported that regular endurance exercise may increase the antioxidant capacity. The aim of this study is to investigate whether if there is any protective effect of a regular endurance exercise on oxidative stress in kidney tissues of hyperthyroid rats.

METHODS: Twenty-three male Sprague Dawley rats were divided into four groups: Control, hyperthyroid, exercise and hyperthyroid with exercise. Hyperthyroid was induced in rats by subcutaneous injections at a dosage of 250 µg L-Thyroxine per kg body weight. Endurance training lasted 8 weeks and consisted of 45 minutes daily treadmill running at a speed of 23 m/minute for 5 days a week. The levels of MDA, GSH and GSH-Px activity were measured in kidney homogenates.

RESULTS: MDA level of the hyperthyroid group was significantly higher than the those of the control group ($p=0,022$). On the other hand the MDA level of the exercise group was significantly lower than the MDA level of the hyperthyroid group ($p=0,001$). GSH level and GSH-Px activities were lower in the hyperthyroid group comparing the control group ($p<0,05$). GSH level and GSH-Px activity in the exercise group were higher than compared with the hyperthyroid group ($p<0,05$).

CONCLUSION: The results of our study show that L-Thyroxine injection may increase oxidative stress by causing lipid peroxidation at kidney tissues and endurance training may decrease oxidative stress.

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Trimetazidine Improves Exercise Performance in Rats Exposed to Swimming Exercise

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AIM: Trimetazidine used for the treatment of ischemic diseases is thought that it reveals its effects by preventing acidosis, blocking Na⁺ and Ca²⁺ ion channels, decreasing free oxygen radical formation and inducing variety of signal pathways for inhibition of apoptosis. Muscle damage resulted from excessive muscle activation and free oxygen radicals may decrease the performance in sportsmans related in such as swimming, running, biking and in persons work heavy labors. We aimed to investigate effects of trimetazidine on the exercise performance in rats exposed to swimming exercise.

METHODS: All procedures applied were approved by Animal Research Local Ethics Committee (Abant İzzet Baysal University, 2014/38). In the study, 14 male Wistar rats were used. Control group(n=7) were administered saline(0,2 ml; i.p.), trimetazidine group(n=7) were administered trimetazidin(10 mg/kg, i.p.) and swum in Morris water maze for 21 days. The exhaustion criteria was to remain under water for 10 seconds. Time began to swim up to the moment of exhaustion of rats were recorded by the time the timer. Data were analyzed using GraphPad Prism software.

RESULTS: While swimming time of trimetazidin applied rats at the end of twenty-one days rose from 70.37±22.49 to 82.54±5.64 minutes ($p<0,05$), there is no a significant difference in control group (from 38.43±26.90 to 44.74±7.88 min) furthermore in TMZ group, a significant increase occurred in swimming time than the control group (from 44.74±7.88 to 82.54±5.64 min) ($p<0,001$).

CONCLUSIONS: The beneficial effect of trimetazidine on the time of skeletal muscle strength may increase sport performance of athletes in various fields and may reduce their healing times to make them active again after sports injuries. Trimetazidine may reveal its effects preventing free oxygen radical formation in skeletal muscle and prevent the formation of Caspase_3 stimulating MAPK/AKT signaling pathway to inhibit apoptosis.

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Hemorheological Effects of Exercise Training and Detraining In Spontaneously Hypertensive Rats

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AIM: Favorable effects of exercise in hypertension and hemorheological responses to various exercise types have been studied extensively. Cessation of exercise (detraining) after a short period is a common problem. Hemorheological responses to swimming exercise and detraining have never been investigated in spontaneously hypertensive rats (SHR). We aimed to investigate the effects of moderate intensity swimming exercise followed by detraining on erythrocyte deformability and aggregation in SHR. **METHODS:** Animals were randomized into exercised, detrained (5-10 weeks) groups. Corresponding sedentary rats were grouped as Time 1-2-3. Exercise of 60 min, 5 days/week/10 weeks was applied. Detraining rats discontinued training during 5-10 weeks after exercise. Systolic blood pressure (SBP) was measured every 2 weeks by tail-cuff method. Erythrocyte deformability, aggregation were determined by ektacytometry.

RESULTS: Exercise training reduced SBP in both normotensive and SHR rats, decreased erythrocyte aggregation in SHR compared to control rats. SBP lowering effect of exercise was maintained until a detraining period equal to the duration of the exercise protocol, while 5 weeks of detraining reverted the improvements observed in erythrocyte aggregation of SHR. Although exercise did not affect erythrocyte deformability, detraining for 10 weeks decreased RBC deformability in normotensives, but not in hypertensives.