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**LACTATE ADMINISTRATION STIMULATES FAT OXIDATION AND LIVER GLYCOGEN STORAGE IN RATS****Kiwon Lim**

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Lactate is known as the end-product of glycolysis and is considered as a fatigue product. However, since last decades there has been demonstrated positive effect of lactate. Nevertheless, it is not known whether the lactate changes on energy metabolism and energy substrates utilization. Accordingly, we investigated the effects of lactate treatment energy metabolism for six hours. We randomized seven weeks 32- male SD rats into four groups: the control (Con: DW), caffeine (Caf: 10mg/1kg), lactate (Lac: 4g/kg), and caffeine and lactate mixed compound (Caf+Lac: 10mg+4g/kg). We treated different substances to each group by oral administration. There was no significant difference in oxygen uptake and carbon dioxide production between groups. However, with fat oxidation, Lac and Caf+Lac were significantly higher than Con in first two hours after administration in fat oxidation. These results suggest that the caffeine and lactate mixed compound can improve fat oxidation over two hours. Moreover, we investigated gene expression within two hours with Caf+Lac group, because they were the highest group in fat oxidation. We treated same dose of Caf+Lac and sacrificed at 30 minutes, 60 minutes and two hours after the dose. For the result, *MCT1* mRNA decreased after two hours compared to zero and *FAT/CD36* mRNA showed up and down tendency with significant difference within two hours. Finally, *PDK4* mRNA increased at two hours compared to zero. Also, when we examined blood sample we could see there is a significant increase in glycerol level after two hours. Furthermore, we could find significant increase within two hours. From these data, glycolysis might be understood as increase in glycogen synthesis, has possibility of shown to as increase in fat oxidation. For this reason, lactate administration could be an effective supplement for obese people.

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