

Recent studies in both humans and rodents have shown that the mechanoreflex and metaboreflex are exaggerated in type 2 diabetes mellitus (T2DM). Hyperglycemia is a main characteristic of T2DM and is known to cause damage to both cardiovascular and nervous system structures. However, the effects of the presence of hyperglycemia on the mechanoreflex and metaboreflex are not known.

**PURPOSE:** To determine the acute effect of hyperglycemia on the mechanoreflex and metaboreflex.

**METHODS:** Experiments were conducted after an overnight fast in unanesthetized, decerebrated healthy male and female Sprague-Dawley rats. The mechanoreflex was evoked by stretching the Achilles tendon for 30 s and the metaboreflex was evoked by locally injecting lactic acid (0.2ml, 24mM) into the hindlimb. Time and dosage for glucose infusion were selected based on a preliminary study that showed infusing 250 mg/ml of glucose solution for 15 min into the hindlimb circulation, with blood flow to and from the hindlimb restricted, would elevate local blood glucose concentration to the same degree as that seen in T2DM rats with an exaggerated exercise pressor reflex. To elicit an acute hyperglycemia environment while preventing an endogenous insulin response, somatostatin (3.9 ug/100 ul) was infused systemically and simultaneously along with local glucose infusion. Changes in mean arterial pressure ( $\Delta$ MAP) and heart rate ( $\Delta$ HR) in response to tendon stretch and lactic acid injection were measured and compared before and after infusion.

**RESULTS:** We found that the peak pressor and cardioaccelerator responses to tendon stretch were not significantly affected by acute hyperglycemia ( $\Delta$ MAP before:  $12 \pm 2$  mmHg, after:  $12 \pm 3$  mmHg,  $n=6$ ,  $p>0.05$ ;  $\Delta$ HR before:  $10 \pm 3$  bpm, after:  $10 \pm 3$  bpm,  $n=6$ ,  $p>0.05$ ). Likewise, the pressor and cardioaccelerator responses to lactic acid were not significantly affected by acute hyperglycemia ( $\Delta$ MAP before:  $13 \pm 2$  mmHg, after:  $16 \pm 3$  mmHg,  $n=10$ ,  $p>0.05$ ;  $\Delta$ HR before:  $10 \pm 2$  bpm, after:  $12 \pm 5$  bpm,  $n=10$ ,  $p>0.05$ ).

**CONCLUSIONS:** The acute presence of hyperglycemia in the local circulation of the hindlimb does not contribute to the exaggerated mechanoreflex or metaboreflex. This project was supported by NIH R01 HL144723.

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**933** Board #59 May 27 2:30 PM - 4:00 PM  
**The Role Of Camk2 $\delta$ -MEF2 Signaling Pathway In Aerobic Exercise-induced Improvement Of Cardiac Function In Hypertension**

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(No relationships reported)

**Objective:** The purpose of this study was to investigate the effects of aerobic exercise on the Calcium/calmodulin-dependent protein kinase II $\delta$ (CaMKII $\delta$ )-Myocyte enhancer factor-2(MEF2) signaling pathway in SHR myocardial cells, and the role of the A-kinase anchoring protein 150(AKAP150).

**METHODS:** 12-week-old male SHR and WKY rats were randomly assigned to sedentary groups (WKY-SED, SHR-SED) and exercise training groups (WKY-EX, SHR-EX). Exercise groups were performed a 12-week moderate intensity treadmill running. After 12 weeks, the myocardial cells were enzymatically isolated. The experimental methods include HE staining, the Langendorff technique of isolated heart perfusion, immunohistochemistry, immune cell fluorescence, Western blot.

**RESULTS:** 1) After 12 weeks of exercise, SBP in both WKY-EX and SHR-EX were significantly lower than that of their sedentary counterparts. 2) Compared with the WKY-SED group, the SHR-SED group +dp/dtmax, -dp/dtmax significantly decreased, and the SHR-EX group was significantly higher than the SHR-SED group. +dp/dtmax significantly increased, -dp/dtmax decreased ( $P<0.01$ ), LVSP increased ( $P<0.01$ ). 3) The fluorescence intensity of CaM and AKAP150 in the SHR-SED group was higher than WKY-SED group ( $P<0.01$ ), and the fluorescence intensity of the SHR-EX group AKAP150 was higher than SHR-SED group ( $P<0.01$ ), and the expression of CaM was lower than the SHR-SED group ( $P<0.01$ ). 4) The protein expression of p-CaMKII $\delta$ , CaMKII $\delta$  and AKAP150 in the SHR-SED group was higher than that in the WKY-SED group ( $P<0.01$ ). The expression of p-CaMKII $\delta$ /CaMKII $\delta$ , p-HDAC4/HDAC4 and MEF2 of SHR-EX group are lower than the SHR-SED group ( $P<0.01$ ). The expression of AKAP150 of SHR-EX was higher than SHR-SED group ( $P<0.01$ ).

**CONCLUSION:** Aerobic exercise reduced the activity of the CaMKII $\delta$ -MEF2 signaling pathway and increased the expression of AKAP150 in the SHR myocardial, which is one of the molecular mechanisms to improve the function of the heart.

**Key words:** cardiac function; CaMKII $\delta$ -MEF2 signaling pathway; aerobic exercise; AKAP150

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**B-67** Free Communication/Poster - Renal Physiology

Wednesday, May 27, 2020, 1:30 PM - 4:00 PM

Room: CC-Exhibit Hall

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**934** Board #60 May 27 2:30 PM - 4:00 PM  
**Physical Activity Is An Important Prescription For Kidney Transplant Patients And Those Receiving Dialysis**

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Chronic kidney disease (CKD) affects 13% of U.S. adults. Patients endure a disproportionate amount of cardiovascular complications with nearly 50% of dialysis patients experiencing a premature death related to cardiovascular disease. Although participation in regular physical activity can mitigate CKD complications, more than half of nephrologists fail to recommend it to their patients.

**PURPOSE:** To investigate the effects of physical activity on hemoglobin and health outcomes in CKD patients.

**METHODS:** We analyzed patients admitted to a hospital in the Midwestern United States. A comprehensive metabolic panel and health history, including physical activity (PA) levels, were obtained upon admittance. Patients were assigned a status of either active (N=23) or sedentary (N=45). Independent-samples t-tests and chi-squared tests compared sedentary and active groups. Linear and negative binomial regression models tested the effect of PA on Hb and hospital length of stay (LOS).

**RESULTS:** Across the total sample, patients were  $64.7 \pm 17.4$  years old, 40.3% were obese, they remained in the hospital for  $6.9 \pm 7.5$  days, 16.2% received dialysis during treatment, 5.9% had a history of kidney transplant, and 4.4% died. Patients with a history of transplant had a reduction in Hb of 3.7 g/dL ( $p<0.001$ ) and exhibited a trend for a higher rate of engagement in PA ( $p=0.073$ ). Patients receiving dialysis had 2.4 g/dL lower Hb ( $p=0.006$ ) and comparable rates of PA ( $p=0.616$ ). All cases of mortality occurred in the sedentary group, and the Hb of patients who expired was 2.2 g/dL lower; owing to a small sample, this failed to reach significance ( $p=0.179$ ). Physically active patients had 1.4 g/dL higher Hb ( $p=0.041$ ). Holding constant transplant status and whether patients received dialysis, PA predicted an increase in Hb of 1.75 g/dL ( $p=0.007$ ; 95% CI: 0.489 to 3.011) and a 96.4% shorter LOS ( $p=0.005$ ; 95% CI of IRR: 0.003 to 0.373). In turn, Hb was a trending predictor of mortality; each additional g/dL predicted a 38.3% reduction in odds ( $p=0.069$ ; 95% CI of OR: 0.367 to 1.038).

**CONCLUSION:** Independent of dialysis and transplant status, engagement in regular physical activity elicited an increase in Hb and shortened hospital stays among CKD patients. Our findings reinforce the importance of physical activity prescription as a standard component of care.

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**935** Board #61 May 27 2:30 PM - 4:00 PM  
**Evaluating Acceptability Domain Of An Intradialytic Exercise Program-Patient Adherence And Nursing Documentation**

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