

# Turkish Society of Physiological Sciences

## 41<sup>st</sup> National Physiology Congress

clock components: funny current and T-type Ca<sup>2+</sup> channel remained unaltered. Hypothyroidism did not affect RyR2 and NCX1 levels; however, SERCA2a mRNA levels were reduced by 37% (P<0.05). SERCA2a mRNA levels were negatively regulated by phospholamban and this transcript was upregulated by 289% in the hypothyroid SN (P<0.05).

CONCLUSIONS: PTU causes hypothyroidism with severe bradycardia in healthy rats. In the hypothyroid SN, SERCA2a downregulation coupled with phospholamban upregulation would compromise the Ca<sup>2+</sup>-clock component, causing bradycardia.

### PC128

#### The Effect of Picoside-2 on Erythrocyte Deformability and Lipid Peroxidation in Streptozotocin-Induced Diabetic Rats subjected to Left Anterior Descending Artery-Ischemia reperfusion

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AIM: Ischemia-reperfusion (IR) injury is a notorious phenomenon following vascular interventions. Antioxidant, neuroprotective and anti-inflammatory effects of picoside-2 have been established by recent studies. We decided to investigate the effects of picoside-2 on erythrocyte deformability and lipid peroxidation in streptozotocin-induced diabetic rats subjected to left anterior descending (LAD) artery ischemia reperfusion. METHODS: There groups were diabetes control (DC-group), diabetes-picoside-2 (DP-group), diabetes IR (IR-group) and diabetes-IR-picoside-2 (IR-P-group). Rats were kept alive for month. Then all rats were sacrificed after a period of 45 minutes ischemia followed by 90 minutes of reperfusion and blood samples were collected simultaneously. Deformability measurements were conducted in erythrocytes that were kept in serum physiologic solutions buffered with phosphate. MAD and NO levels were also measured.

RESULTS: The induction of diabetes was found to increase the relative resistance compared to the control group (p<0,0001). IR was found to influence the erythrocyte deformability compared to the other groups (p<0,0001,p=0,009,p=0,013,p=0,009) Picoside-2 implementation to the IR generated diabetic rats was found to have therapeutic effect on erythrocyte deformability (p=0,009). CONCLUSION: Our findings suggest that further studies can be conducted to display the beneficial effects of picosid-2 against IR injury and extend its indications.

### PC129

#### Measurements of Surface ECG Parameters And Heart Rate Variability In Anesthetized Spontaneously Breathing Mice

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INTRODUCTION: The aim of this study was to evaluate surface electrocardiography records (sECG) in differently anesthetized adult BALB-C mice weighting 26,2 ±2,1g (BW). METHOD: Three groups were constructed according to anesthetics/drugs applied: Mice were anesthetized with intraperitoneal (i.p.) Na-Pentobarbital (75 mg/kg BW, n=7), or with Na-Pentobarbital+Fentanyl (75 mg/kg BW, i.p. + 0,04 mg/kg BW i. p, n=7), or with Ketamine+Xylazine (100 mg/kg BW + 8 mg/kg BW, n=7). The rectal temperatures were kept around 36,0 °C using a heating pad; sECG recordings were performed using needle electrodes as DII (PowerLab-Australia), with the sampling rate of 4 kHz; highpass and lowpass filter setting were 0,3 Hz and 1 kHz, respectively.

For electrocardiographic examination, we have measured not only surface ECG parameters but also the heart rate variability (HRV). HRV analysis were presented using frequency domain analysis; the band widths were assessed as Very Low Frequency (VLF): 0-0,15 Hz, Low Frequency (LF): 0.15-1.5Hz, High Frequency (HF): 1,5-5Hz. RESULTS: The ECG values in Na-Pentobarbital group (I) were found as: PR interval: 28,6±2,4 ms, RR interval: 158,1 ±2,0 ms (HR:379,5 ±4,8 bpm), QRS duration: 7,7±1,2 ms QT:12,3± 2,8 ms QTC: 31,2 ± 7,8ms

ECG values in Na-Pentobarbital+Fentanyl group (II) were found being much closed to those of group (I), only the PR interval is slightly increased (p<0.05).The heart rate was drastically decreased in Ketamine-Xylazine group (III) to 213, 5 ± 25,1 bpm (p<0,01). Ketamine-Xylazine combination prolonged the both QT and QTc to 20,7± 2,0 ms (p<0,05), and to 39,2 ± 3,3 ms (p<0,02), respectively.

The results of HRV analysis of Na-Pentobarbital and Na-pentobarbital+Fentanyl groups showed no difference. But, Ketamine-Xylazine (III) has remarkably changed HRV, compared to Na-Pentobarbital (I): the component of LF band is increased (p<0,01) whereas both VLF and HF components are decreased (p<0,01 and p<0,05, respectively).

CONCLUSION: Our study showed that HRV analysis may be a sensitive method to evaluate electrocardiological effects of anesthesia procedures for mice. Autonomic nervous system controlling the heart may be differently modulated by anesthetics used here.

### PC130

#### Effect of Smoking and Exposure Cigarette Smoke on Cardiac Autonomic Function of Healthy Young Adults

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AIM: In this study, it was aimed to evaluate changes in heart rate variability (HRV) and heart rate turbulence (HRT) that are indicators of cardiac autonomic functions in young adults who are either active smokers or passive smokers.

METHODS: 18-24yo patients were selected and allocated into three groups as active smokers (group-1), passive smokers (group-2) and non-smokers (group-3). Dependence of patients was evaluated with Fagerstrom Test. Subjects were performed cardiological examination and record ECG, EKO and then values of HRT and HRV of subjects were evaluated after taking record of rhythm holter for 24h.

RESULTS: According to holter recordings of mean heart rate; no

## Turkish Society of Physiological Sciences 41<sup>st</sup> National Physiology Congress

differences were found between group-1 and group-2, nevertheless, group-3 were found lower than from other groups ( $p < 0.001$ ). No difference was found between group-1-2 in terms of total ventricular additional beat, nevertheless, in group-3 this value was found significantly lower from other 2 groups ( $p < 0.001$ ). Statistically significant difference was found in Total Onset (TO) and Turbulance Slope (TS) value that were calculated from analysis of 24h holter recordings of groups ( $p < 0.01$ ). In HRT analysis; there were 21 cases in group-1, 10 cases in group-2 and 2 cases in group-3 which have TO value ( $p < 0.05$ ). Similarly, significant TS values observed in three groups were as follows: 21 cases in group-1, 8 cases in group-2, 1 case in group-3 ( $p < 0.05$ ).

**CONCLUSIONS:** It has been shown that value of HRV and HRT in cigarette smokers and in passive smokers, are high enough that can cause cardiovascular risk.

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### PC131

#### The Contribution of Carbon Monoxide to Age-dependent Changes in Renal Vascular Tonus

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**INTRODUCTION:** Carbon monoxide (CO) is considered as an important mediator released from endothelium and smooth muscles and is responsible for regulating vascular tonus. Depending on age, the production of many endogenous mediators and their bioavailability are reduced. Because of these reasons, our aim is to evaluate the contribution of CO to renal vascular tonus in aged rats.

**MATERIALS-METHODS:** Young (6 to 8 months) and aged (24 months) Wistar Albino rats, were used in our study. Isolated renal arteries segments were mounted on wire myrograph. CO response of renal vascular bed were studied endogenously and exogenously. All vessel segments were treated with HO inhibitor in order to assess the endogenous CO contribution to vascular tonus and were contracted with phenylephrine (PHE) before and after the HO inhibitor (CrMP) treatment. The CO releasing molecules, tricarbonyldichlororuthenium (II) dimer (CORM) vasodilatory response, with the effect mechanism of CO was examined in the presence of cGMP inhibitor, 1H-[1,2,4]Oxadiazolo[4,3-a] quinoxaline-1-one (ODQ), and non-specific potassium channel inhibitor tetraethylammonium (TEA), following CO exogenous vasodilatory response to CORM. Additionally, HO-2 protein expression was studied with western blot analysis in isolated vessel segments. Paired t test, variance analysis of repeated measurements and Tukey test as post-hoc were used.

**RESULTS:** There was no contraction effect on Phe in the presence of CrMP in aged rats. CORM dose dependent vasodilatory response decreased in renal artery, 1st branch and 3rd branch of renal artery ( $p < 0,01$ ) and only TEA suppressed this vasodilatory response in aged rats ( $p < 0,01$ ). HO-2 expression decreased in aged rats.

**CONCLUSIONS:** The results of this study show that diminished CO production and vasodilatory effect in vessel of aged animals.

### PC132

#### The Role of ATP-Dependent Potassium Channels in the Effect of Exercise and Nutrition on the Ischemia Reperfusion Arrhythmias

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**INTRODUCTION:** Exercise is cardioprotective against arrhythmia by increasing the expression of KATP channels was shown previously. In this study the effect of exercise, food restriction and combination of both on the number of myocardial KATP channels in rats fed with standart and protein rich food were aimed to investigate.

**METHODS:** In this study, 64 male and female Sprague Dawley rats in 15 months old were used for immunohistochemical staining and 141 rats were used for evaluating the arrhythmias followed by ischemia and reperfusion (I/R). Animals were divided into two main groups, standart and protein rich foods. Both main groups were divided into four subgroups, these are control, exercise, food restriction and exercise + food restriction groups. Forty min/days swimming exercise were applied in 5 days/week during 6 weeks. Food restriction was performed by reducing 50% of daily food. Ischemia was produced by the ligation of left coronary artery for 6 minutes and reperfusion by the releasing of this artery for 15 minutes. The arrhythmia scores were determined from ECG during I/R and differences between groups determined by One-way ANOVA. SUR2A was determined by immunoblotting method for analyzing of number of KATP channels in myocardial tissue sampled from 64 rats that no I/R were performed. Density of SUR2A was determined by light microscopy.

**RESULTS:** The density of KATP chanel were not different between control group. Exercise and exercise+food restriction increased density of KATP channels in male and female groups in rats fed with standart food in respect to their control group. Arrhythmia score in ischemia was also significantly lower in this group than the control ( $P < 0.05$ ).

**CONCLUSIONS:** It is shown in this study, exercise alone and in combination with food restriction increases the density of KATP chanel. Arrhythmias was also less than the controls in this groups. This result support the suggestion that cardioprotection against arrhythmia increases with the increasing the number of KATP chanel in myocardial cell.

### PC133

#### Effect of Carnosine Pretreatment against Ischemia/Reperfusion Damage in Rat Heart

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**AIM:** Increased intracellular H<sup>+</sup> ion concentration is one of the most important causes of cellular death induced by ischemia reperfusion (I/R) injury in the heart. Carnosine (CAR) is a dipeptide consisting from beta alanine- L-histidine. It decreases the I/R injury because it's a good antioxidant and intracellular H<sup>+</sup> buffer. The aim of this study is to demonstrate the effect of the CAR during I/R injury on cardiac cells.

**METHODS:** The study consisted of a control group with global I/R (ischemia time is 30 min and reperfusion time is 60 min.) in cardiac tissue (CONT) and a second group with I/R after two weeks of carnosine treatment (200 mg/kg i.p.) (CAR). The heart tissues were isolated under anesthesia and then they were perfused using Langerdorff perfusion system. Left ventricular systolic pressure