



HUNGARIAN MEDICAL
ASSOCIATION OF AMERICA
HUNGARY CHAPTER

AMERIKAI MAGYAR ORVOSZÖVETSÉG
MAGYARORSZÁGI TAGOZAT

Email: hungary@hmaa.org

Web: <http://www.hmaa.org/chapters/hungary/>



HMAA
FÜRED
2020 ONLINE
hmaa.org

Leadership

Ákos Koller, MD, PhD, Prof.

President

Ádám D. Tárnoki MD, PhD, med. habil.

Vice President

Dávid L. Tárnoki MD, PhD, med. habil.

Secretary

Zsófia Karádi, MD

Membership, Treasurer

Katalin Nagy, Prof.

Scientific Advisor

Bálint Lippai

Exchange Programs

Lilla Juhász

English Courses Liaison

Student representatives in Hungary

Szeged:

Melinda Vanya, MD

Lilla Ágnes Juhász, MD

Zsuzsanna Ida Petykó, MD

Luca Barnaföldi, MD

Pécs:

Andrea Horváth, MD

Anna Budai, MD

Luca Komáromy

Bálint Soma Környei

Dorottya Kata Szabó

Debrecen:

Árpád Szőör, MD, PhD

Máté Szabó

Bence Cs. Szabó

Budapest:

Beáta Zita Körösi, MD

Réka Lumbach

Helána Halász

Klára Aliz Stark

Rebeka Sára Debreceni

Aliz Persely

Ferenc Balázs Farkas

CERTIFICATE

This is to certify that

Flóra Diána Gausz

University of Szeged

gave a presentation

at the 14th Annual Conference (hybrid: in person/online) of the
Hungarian Medical Association of America - Hungary Chapter
in the State Hospital of Cardiology, Balatonfüred
in August 28 -29, 2020.

Balatonfüred, August 29, 2020




Prof. Ákos Koller, MD, PhD
President, HMAA-HC


Prof. András Khor, MD, PhD
President, HMAA



THE SYNERGISTIC EFFECT OF HYPOXIA AND COMPLEMENT MASP-1 IN E-SELECTIN EXPRESSION ON ENDOTHELIAL CELLS

Flóra Demeter, László Cervenak

Dept. of Internal Medicine and Hematology, Semmelweis University, Budapest

Keywords: hypoxia, endothelial cells, complement, MASPs, inflammation

Aims: Hypoxia and hypoxia/ reoxygenation are direct pathogenetic components in stroke and AMI developing as a consequence of atherosclerosis. It is also known that the complement lectin pathway plays an important role in the pathomechanism of atherosclerosis, a disease characterized by inflammation. We previously demonstrated that MASP-1, the most abundant enzyme of the complement lectin pathway induces an inflammatory phenotype of endothelial cells. There is no data whether hypoxia and MASP-1 can potentiate each other's effects, therefore, we aimed to investigate the possible synergism between them.

Methods: We used confluent layer of HUVECs. Immuno-fluorescence microscopy was applied to study HIF1 α nuclear translocation. Ca²⁺ mobilization was assessed by fluorescence microscopy using Fluo4-AM. Adhesion molecules and IL-8 were detected with cellular and sandwich ELISA. Endothelial permeability was assessed with the XperT method. Statistical analyses were performed by GraphPad Prism 7.0.

Results: We verified the hypoxia mimetic effect of CoCl₂, by showing its time- and dose- dependent effect on HIF1 α nuclear translocation. Both 24 and 4 hours of CoCl₂ pre-treatment enhanced the Ca²⁺ mobilization in response to MASP-1. Next, we investigated the alteration of surface adhesion molecules and cytokines. E-selectin was synergistically upregulated by CoCl₂ and MASP-1, whereas MASP-1 induced VCAM-1 expression could be inhibited by CoCl₂. Both agents increased the IL-8 production and the endothelial permeability at 24 hours.

Conclusions: E-selectin is a crucial adhesion molecule in the homing of neutrophils. In inflammatory processes cellular infiltration oftentimes accompanies the increased vascular permeability. Therefore, the permeability increasing effect of hypoxia and MASP-1 and their synergism in endothelial E-selectin expression might partially explain the strong neutrophil infiltration, well-known in the acute phase of stroke and AMI. These data together suggest that MASP-1 might be a drug target in these atherosclerosis-related diseases.

Support: NKFI-K115623

EFFECT OF STELLARIA MEDIA TEA IN A DIABETIC RAT MODEL

Alexandra Fejes¹, Dr. Virág Demján¹, Andrea Sója¹, Flóra Diána Gausz¹, Dr. Tivadar Kiss², Dr. Gergő Szűcs¹, Dr. Andrea Siska³, Dr. Imre Földesi³, Dr. Dezső Csupor², Dr. Márton Pipicz¹, Dr. Tamás Csont¹

1. University of Szeged, Faculty of Medicine, Department of Biochemistry

2. University of Szeged, Faculty of Pharmacy, Department of Pharmacognosy

3. University of Szeged, Faculty of Medicine, Department of Laboratory Medicine

Keywords: chickweed, oral gavage, diabetes, blood glucose, cardiomyopathy

Aims: Diabetes mellitus is a disease characterized by elevated blood glucose levels and impaired glucose tolerance, affecting more than 422 million people worldwide. Nowadays, besides drugs, medicinal plants - for

instance chickweed (*Stellaria media*) - have gained popularity as treatment. *Stellaria media* is a common widespread species, mainly consumed as salad or tea. In folk medicine, chickweed tea is believed to have anti-diabetic effect; however, its efficacy has not been proved. Hence, our goal was to investigate the effect of *Stellaria media* tea in a diabetic rat model.

Methods: Male Wistar rats were used in three experimental groups: control, diabetic, diabetic + *Stellaria media* (n=10 in each group). The control group received standard laboratory rat chow for 20 weeks, while the other two groups received fructose enriched diet and were subjected to streptozotocin injection on week 17. Half of the diabetic rats were treated with *Stellaria media* tea (100 mg/kg b.w./day from the beginning) administered by oral gavage, while the others received distilled water. Blood glucose levels were measured every 4 weeks, accompanied with oral glucose tolerance test from week 12. At termination of the animals, blood samples were collected from the abdominal aorta and working heart perfusion was performed according to Neely.

Results: The fructose-enriched diet and streptozotocin injection significantly increased serum glucose levels compared to control (8.33 ± 0.30 vs. 5.97 ± 0.16 mmol/L, $p < 0.05$). Administration of chickweed tea did not prevent blood glucose elevation (8.45 ± 0.37 mmol/L). Diabetes induced a cardiac dysfunction, described by deterioration of cardiac output and cardiac work. However, *Stellaria media* preserved cardiac function in settings of diabetes.

Conclusions: Our results show that *Stellaria media* tea has beneficial effect on the negative cardiac alterations caused by experimental diabetes, but it is not proceeded through the improvement of carbohydrate metabolism.

Support: GINOP-2.3.2-15-2016-00006, EFOP-3.6.2-16-2017-00006, 20391-3/2018/FEKUSTRAT

INVESTIGATION OF POTENTIAL CARDIOPROTECTION INDUCED BY ELECTRICAL STIMULATION OF SKELETAL MUSCLE

Márton Richárd Szabó, Réka Marik, Kamilla Nagy, Tamás Csont, Csaba Csonka

Department of Biochemistry Faculty of Medicine University of Szeged

Keywords: EMS, heart, cardioprotection, ex vivo, reperfusion injury

Aims: Electrical muscle stimulation (EMS) is a widely used method in sport- and rehabilitation therapy. EMS treatment of chronic heart failure patients improved the quality of life in a comparable extent to conventional exercise. However, the cardiac preconditioning effect of EMS has not been proven so far, therefore the aim of this study is to investigate the potential cardioprotective effect of acute EMS treatment.

Methods: Low frequency EMS treatment was applied on the gastrocnemius muscle of male Wistar rats for three days (one treatment/day). After 24hr of the last EMS treatment, hearts were isolated and perfused ex vivo using 30 min global ischemia and 120 min reperfusion protocol. At the end of reperfusion myocardial infarct size was measured, and heart specific creatine kinase (CK-MB) and lactate dehydrogenase (LDH) enzyme releases were determined from the coronary effluent. Phosphorylation state of the cardioprotective Akt, Erk1/2 and STAT3 proteins was also measured.

Results: Myocardial infarct size was not reduced significantly following the EMS treatment when compared to the untreated control group. However, EMS treatment significantly reduced the LDH enzyme activities both at the onset (6.03 ± 0.68 vs 9.92 ± 1.67 U/min/g) and at the end of the reperfusion (44.99 ± 6.53 vs 67.60 ± 7.57 U/min/g). From the investigated proteins, only the phosphorylation of Erk2 was increased significantly due to EMS treatment.