PARTICIPAÇÃO NACIONAL EM ARTIGOS RECENTES NA ÁREA DA HEMORREOLOGIA E MICROCIRCULAÇÃO

TISSUE OXYGEN DEMAND IN REGULATION OF THE BEHAVIOR OF THE CELLS IN THE VASCULATURE

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Abstract

The control of arteriolar diameters in microvasculature has been in the focus of studies on mechanisms matching oxygen demand and supply at the tissue level. Functionally, important vascular elements include endothelial cells (EC), vascular smooth muscle cells (VSMC) and red blood cells (RBC). Integration of these different cell types into functional units aimed at matching tissue oxygen supply with tissue oxygen demand is only achieved when all these cells can respond to the signals of tissue oxygen demand. Many vasoactive agents that serve as signals of tissue oxygen demand have their receptors on all these types of cells (VSMC, EC, and RBC) implying that there can be a coordinated regulation of their behavior by the tissue oxygen demand. Such functions of RBC as oxygen carrying by hemoglobin (Hb), rheology, and release of vasoactive agents are considered. Several common extra- and intracellular signaling pathways that link tissue oxygen demand with control of VSMC contractility, EC permeability, and RBC functioning are discussed.

Microcirculation. 2013 Feb 26.
doi: 10.1111/micc.12052. [Epub ahead of print]

EFFECTS OF ACETYLCHOLINE ON AN ANIMAL MODE OF INFLAMMATION

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Abstract

Acetylcholinesterase (AChE) is found both on the membranes of neuronal and non-neuronal cells. In this study we performed intravenous administrations of velnacrine (VLN) and acetylcholine (ACh), respectively, AChE inhibitor and substrate, in an animal model of lipopolysaccharide (LPS)-induced inflammation in Wistar rats. Using intravital microscopy the number of rolling and adherent leukocytes in post-capillary venules was monitorized and blood samples were collected for TNF-α plasma concentrations determination. Our results showed that in presence of LPS, ACh has an anti-inflammatory effect, seen by a decrease in TNF-α plasma levels and maintains the number of rolling and adherent leukocytes. The presence of VLN before LPS almost blocked the LPS-induced rolling and TNF-α releasing. Thereby VLN seems to have, like ACh, an anti-inflammatory effect by diminishing TNF-α concentrations.

Clin Hemorheol Microcirc. 2013;53(1-2):209-16.
doi: 10.3233/CH-121646.

FIBRINOGEN INTERACTION WITH THE RED BLOOD CELL MEMBRANE

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Abstract

A brief review of the fibrinogen molecule composition and structure is presented like as an introduction to the effects of this plasma protein on the red blood cell hemorheoplogical properties namely erythrocyte aggregation tendency and deformability ability. The protein membrane RBC target for fibrinogen is also highlight as well as the erythrocyte signal transduction pathway associated with nitric oxide mobilization resulting from its binding.

Clin Hemorheol Microcirc. 2013;53 (1-2):39-44.
doi: 10.3233/CH-2012-1574.

CXCL8 (IL-8) MEDIATES NEUTROPHIL RECRUITMENT AND BEHAVIOR IN THE ZEBRAFISH INFLAMMATORY RESPONSE

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Abstract

Neutrophils play a pivotal role in the innate immune response. The small cytokine CXCL8 (also known as IL-8) is known to be one of the most potent chemoattractant molecules that, among several other functions, is responsible for guiding neutrophils through the tissue matrix until they reach sites of injury. Unlike mice and rats that lack a CXCL8 homolog, zebrafish has two distinct CXCL8 homologs: Cxcl8-l1 and Cxcl8-l2. Cxcl8-l1 is known to be upregulated under inflammatory conditions caused by bacterial or chemical insult but until now the role of Cxcl8s in neutrophil recruitment has not been studied. In this study we show that both Cxcl8 genes are upregulated in response to an acute inflammatory stimulus, and that both are crucial for normal neutrophil recruitment to the wound and normal resolution of inflammation. Additionally, we have analyzed neutrophil migratory behavior through tissues to the site of injury in vivo, using open-access phagocyte tracking software PhagoSight. Surprisingly, we observed that in the absence of these chemokines, the speed of the neutrophils migrating to the wound was significantly increased in comparison with control neutrophils, although the directionality was not affected. Our analysis suggests that zebrafish may possess a subpopulation of neutrophils whose recruitment to inflamed areas occurs independently of Cxcl8 chemokines. Moreover, we report that Cxcl8-l2 signaled through Cxcr2 for inducing neutrophil recruitment. Our study, therefore, confirms the zebrafish as an excellent in vivo model to shed light on the roles of CXCL8 in neutrophil biology.

J Immunol. 2013 Apr 15;190(8):4349-59.
doi: 10.4049/jimmunol.1203266. Epub 2013 Mar 18.

CROSSTALK BETWEEN INFLAMMATION, IRON METABOLISM AND ENDOTELIAL FUNCTION IN BEHÇET'S DISEASE

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Abstract

Behçet's disease (BD) is a rare chronic vasculitis of unclear etiology. It has been suggested that inflammatory response has an important role in BD pathophysiology. Herein, we aimed to study the interplay between inflammation, iron metabolism and endothelial function in BD and search for its putative association with disease activity. Twenty five patients clinically diagnosed with BD were selected and twenty four healthy age-sex matched individuals participated as controls. Results showed an increase of total number of circulating white blood cells and neutrophils, serum transferrin, total iron binding capacity, mieloperoxidase (MPO), ceruloplasmin (Cp), C reactive protein, β2 microglobulin and Cp surface expression in peripheral blood monocytes in BD patients comparatively to healthy individuals ($p < 0,05$). Of notice, the alterations observed were associated to disease activity status. No significant differences between the two groups were found in serum nitric oxide concentration. The results obtained suggest an important contribution from innate immunity in the pathogenesis of this disease. In particular, surface expression of leukocyte-derived Cp may constitute a new and relevant biomarker to understand BD etiology.

Clin Hemorheol Microcirc. 2013 Apr 25.
[Epub ahead of print]

PARTICIPAÇÃO NACIONAL EM CONGRESSO INTERNACIONAL

Decorreu no passado mês de Abril, de 15 a 17, a 3rd International Conference On Clinical Experimental Ophtalmology, no HiltonChicago/ Northbrook, USA.

A SPHM esteve representada pela sua presidente que, além e *co-chair* da sessão de abertura, apresentou a comunicação intitulada "**Modulation of Erythrocyte Nitric Oxide Bioavailability",** em que foram co-autores Pedro Teixeira, Teresa Santos-Freitas e Patrícia Napoleão.

Abstract

Changes in tissue oxygen partial pressure are sensed by erythrocyte contributing to vasodilation or vasoconstriction through its nitric oxide bioavailability. Endogenous or exogenous compounds modulate the erythrocyte nitric oxide bioavailability through the membrane targets molecules such as band 3 protein and acetylcholinesterase. Binding of acetylcholine to erythrocyte membrane acetylcholinesterase originates a signal transduction mechanism involving Gi protein and band 3 protein that stimulates nitric oxide efflux. The bioavailability of nitric oxide in presence of velnacrine maleate an acetylcholinesterase inhibitor is preserved. Timolol maleate used in patients with primary open angle glaucoma is an erythrocyte acetylcholinesterase inhibitor. In primary open angle glaucoma the total nitric oxide in retina was consistently higher and associated with intraocular pressure. The aim of this study was to assess the effect of timolol maleate in erythrocyte nitric oxide bioavailability of healthy humans. Human venous blood samples were collected from the forearm vein of fifteen healthy Caucasian men after informed consent. Each blood sample was divided in three 1mL samples, centrifuged, and erythrocyte suspensions were performed in order to achieve 10μM final concentration either of acetylcholine or timolol. Levels of nitric oxide were evaluated by amperometric method. S-nitrosoglutathione, nitrites and nitrates were assessed using the spectrophotometric Griess reaction. Timolol do not change erythrocyte nitric oxide efflux in relation to the control but significantly decreased it when compared to the acetylcholine. Timolol decreased erythrocyte S-nitrosoglutathione significantly in relation to control and to acetylcholine Erythrocyte preserves, in vitro, its bioavailability in healthy humans in presence of timolol maleate. Extrapolating our results to primary open angle glaucoma patients under timolol maleate therapeutic lower levels of reactive nitrogen species may be expected that may explain the impairment oxidative stress previously evidenced by others.

Keywords: erythrocyte; nitric oxide; timolol maleate; acetylcholine, S-nitrosoglutathione, sodium chloride(NaCl)

PRÓXIMOS CONGRESSOS

17TH CONFERENCE OF THE EUROPEAN SOCIETY FOR CLINICAL HEMORHEOLOGY AND MICROCIRCULATION (ESCHM)

July 6-9 2013, Pecs, Hungary
Convention Budapest Ltd.
Mailing Address: H-1461 Budapest, P.O.Box.11,
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Programa e outras informações: http://www.eschm2013.hu

Welcome Note

Fourteen years after the Hungarian joint meeting of the International Society of Biorheology (ISB) and the International Society of Clinical Haemorheology (ISCH), we are pleased to announce that the 17th Conference of the European Society for Clinical Hemorheology and Microcirculation (ESCHM) is also going to be held in Pécs, Hungary in 2013. As Pécs has the pleasure of hosting international experts of rheology for the second time, the Organising Committee hopes to welcome even more participants at the ESCHM congress than we did during the joint meeting of 1999.

Since 1999 Pécs's welcoming atmosphere has not changed much, although many of its buildings and streets have been renovated. In 2010 it was awarded the title "European Capital of Culture" which further strengthened its position and importance both as a cultural and as a scientific centre. Several international conferences of different disciplines have been held in Pécs recently, therefore we are honoured to be the hosts of the ESCHM conference in 2013.

The 17th Conference of the European Society for Clinical Hemorheology and Microcirculation (ESCHM) is going to be held on 6-9 July 2013 in Pécs, Hungary. We hope that it will be the platform of fruitful discussions for the international community of rheologists, where keynote speeches of outstanding scholars will encourage and inspire the participants to present their findings, introduce their latest developments and share their views during the different symposia.

We are convinced that Pécs's atmosphere will provide a pleasant background for an intensive exchange of views and opinions of distinguished scientists of haemorheology coming from Europe and from different countries all over the world. We would appreciate your active participation in this conference and look forward to welcoming you in Pécs in 2013.

Prof. Kalman Toth MD, PhD, ScD
President of the Conference

Gabor Kesmarky MD, PhD
President of the Hungarian Society of Haemorheology

Prof. Nadia Antonova PhD
President of the European Society for Clinical Hemorheology and Microcirculation

Prof. Lajos Bogar MD, PhD, ScD
President of the Local Scientific Committee
Vice-President of the European Society for Clinical Hemorheology and Microcirculation

JOINT MEETING 27TH EUROPEAN MICROCIRCULATION SOCIETY AND 7TH EUROPEAN VASCULAR BIOLOGY

Birmingham, UK,21-26 July, 2013.

On behalf of the European Society for Microcirculation (ESM) and the European Vascular Biology Organisation (EVBO), we are pleased to announce that our two societies will hold a joint meeting under the auspices of the International Union of Physiological Sciences (IUPS) conference in Birmingham International Conference Centre from July 21-26, 2013. The Physiological Society will be responsible for management of the IUPS conference, including site hire, organisation of the professional trade exhibition, online submission of symposia and abstracts, registration, accommodation and advertising. Importantly, IUPS registration fees for our members are modest: £295 for full fee delegates and only £90 for young or retired delegates.

ESM and EVBO members submitted a total of 52 symposia for ranking by a joint ESM/EVBO Scientific Programme Committee and, based on these rankings, we submitted 28 symposia for consideration by the IUPS scientific committee. Almost 300 proposals were submitted for consideration by the IUPS International Scientific Programme Committee (ISPC) at its meeting in Birmingham in March 2012. Giovanni Mann (ESM President 2013), Jeremy Pearson (EVBO Council member) and Ulrich Pohl (Past ESM President) represented ESM/EVBO interests on the IUPS Scientific Programme Committee.

We are pleased to have secured 18 internationally competitive symposia which will be funded by the Physiological Society and clearly identified as ESM/EVBO led symposia. We have emailed the chairs of the successful ESM/EVBO symposia to inform them that Nick Boross-Toby (Director of Events) from the Physiological Society will be liaising directly with them in the next few weeks to provide guidelines concerning financial support for the 18 symposia, arrangements for registration of chairs and invited speakers, accommodation and the banquet.

In addition, the scientific programme is enhanced greatly by designated Plenary, Keynote and Prize Lectures: www.iups2013.org/lectures.html and ESM/EVBO are sponsoring the following Plenary/Keynote Lectures:

- Plenary Lecture – Peter Carmeliet, VIB – KU Leuven, Belgium www.vrc-lab.be
- Keynote Lecture – Elisabetta Dejana, IFOM-IEO, Milan, Italy www.ifom-ieo-campus.it/research/dejana.php
- Keynote Lecture – Takayuki Asahara, Tokai University School of Medicine, Kanagawa, Japan www.cdb.riken.jp/en/labtour/people_html/asahara/index.html
- ESM Malphigi Award Lecture – nominations to be considered by ESM Executive Committee

Further information and updates will be available from IUPS website: www.iups2013.org, and we envisage that the symposium programme will be uploaded in the next few weeks. In the meantime, should you require any additional information concerning the Joint ESM/EVBO Meeting at IUPS in Birmingham, please do hesitate to contact either of us.

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