

May 22nd, 4:30 PM - 6:00 PM

Increased oxidative capacity of circulating polymorphonuclear neutrophils (PMNs) in non-diabetic NASH patients

Timea Csak

University of Massachusetts Medical School, timea.csak@umassmed.edu

Karen Kodys

University of Massachusetts Medical School, Karen.Kodys@umassmed.edu

Angela Dolganiuc

University of Massachusetts Medical School, Angela.Dolganiuc@umassmed.edu

See next page for additional authors

Follow this and additional works at: http://escholarship.umassmed.edu/cts_retreat

 Part of the [Cellular and Molecular Physiology Commons](#), [Digestive System Diseases Commons](#), and the [Gastroenterology Commons](#)

Timea Csak, Karen Kodys, Angela Dolganiuc, Dora Lippai, Michal Ganz, Christopher Marshall, and Gyongyi Szabo, "Increased oxidative capacity of circulating polymorphonuclear neutrophils (PMNs) in non-diabetic NASH patients" (May 22, 2012). *UMass Center for Clinical and Translational Science Research Retreat*. Paper 10.
http://escholarship.umassmed.edu/cts_retreat/2012/posters/10

This material is brought to you by eScholarship@UMMS. It has been accepted for inclusion in UMass Center for Clinical and Translational Science Research Retreat by an authorized administrator of eScholarship@UMMS. For more information, please contact Lisa.Palmer@umassmed.edu.

Presenter Information

Timea Csak, Karen Kodys, Angela Dolganiuc, Dora Lippai, Michal Ganz, Christopher Marshall, and Gyongyi Szabo

Creative Commons License

This work is licensed under a [Creative Commons Attribution-Noncommercial-Share Alike 3.0 License](https://creativecommons.org/licenses/by-nc-sa/3.0/).

INCREASED OXIDATIVE CAPACITY OF CIRCULATING POLYMORPHONUCLEAR NEUTROPHILS (PMNS) IN NON-DIABETIC NASH PATIENTS

Timea Csak, Karen Kodys, Angela Dolganiuc, Dora Lippai, Michal Ganz, Chidima Okoli, Christopher Marshall, Gyongyi Szabo

University of Massachusetts Medical School, Dept. of Medicine

Contact: timea.csak@umassmed.edu

Background: Inflammation and oxidative stress are key factors in the pathogenesis of non-alcoholic steatohepatitis (NASH). Polymorphonuclear neutrophils are capable to produce significant amounts of reactive oxygen species (ROS) via the NADPH oxidase complex. Increased hepatic neutrophil infiltration has been described in steatohepatitis. We aimed to investigate the in vitro ROS generation by neutrophils of NASH patients and the hepatic NADPH oxidase activity in murine steatohepatitis.

Material and methods: PMNs were isolated from peripheral blood of NASH patients (n=16) and healthy controls (n=16). In vitro ROS production was measured by luminol chemiluminescence after phorbol myristate acetate (PMA) or opsonized zymosan stimulation. Hepatic lipid peroxidation and NADPH oxidase activation were measured in mice fed with methionine-choline-deficient (MCD) or -supplemented (MCS) diets.

Results: PMA activated oxidative burst both in patients and controls. However, ROS production was significantly increased in non-diabetic NASH patients (n=9) compared to controls 30 min after the PMA stimulation. PMNs from NASH patients with diabetes mellitus (n=7) did not have higher ROS production after PMA-stimulation compared to controls. The PMA-induced peak chemiluminescence was significantly higher in the non-diabetic NASH patients compared to controls and diabetic NASH patients. No significant difference was observed without any stimulation and in opsonized zymosan induced chemiluminescence. Consistent with the increased oxidative capacity of PMNs in NASH patients, we found increased hepatic lipid peroxidation, higher expression and activation of the NADPH oxidase complex in MCD-steatohepatitis.

Conclusion: Our finding supports the role of neutrophil oxidative stress in NASH. Our novel data suggests that the increased oxidative capacity of the PMNs it is not only localized to the liver but can have systemic effects and serve as a potential biomarker of NASH.