Abstract

Charles University
Faculty of Pharmacy in Hradec Králové
Department of Pharmacology and Toxicology
Student: Simona Benčová
Supervisors: Dr. Claire Demiot, Dr. Aurore Danigo
Assoc. Prof. Přemysl Mladěnka, Ph.D

Title of diploma thesis: Transcriptomic analysis of cutaneous inflammatory biomarkers in a mouse model of small fiber neuropathy.

Peripheral neuropathy is an expanding public health problem conditioned by various diseases and associated with several adverse effects such as the occurrence of chronic pain or increased risk of pressure ulcers (PUs). The aim of this study is to explore, whether the inflammatory state of the skin is modified during peripheral neuropathy and in the course of the formation of a pressure ulcer. The transcriptomic analysis was performed with two different models of mice: PU model and uninjured model, to determine genes that differ in expression and in particular, those involved in inflammation. Small fiber neuropathy was induced in young mice by intraperitoneal injection of resiniferatoxin (50 µg/kg, i.p.) - transient receptor potential vanilloid 1 (TRPV1) agonist. PUs were induced by applying two magnetic plates on the dorsal skin. Gene expression was obtained based on RNA microarray and the results were subsequently verified by qPCR. The transcriptomic analysis of PU showed upregulation of several interleukins (IL1f5, IL1f6, IL11, IL17d, IL20, IL34) and marked downregulation of IL16 between RTX and control mice. The data were however not confirmed by quantitative PCR. The transcriptomic analysis of uninjured skin showed upregulation of IL24, IL33, IL6 as well as downregulation of IL15 and IL34. In addition to interleukins, changes in expression were visible also in chemokines and CD molecules. Our preliminary results indicate that the inflammatory state of the skin is dysregulated by RTX-induced neuropathy, and deregulation of inflammation is undoubtedly associated with the increased risk of pressure sores.