

Validation of Blunting of Inflammatory Markers in LPS Induced Tissue with SPM treatment

Cristina D. Delgado¹, Peyton Robinson¹, Khalid Khan², Vijay R. Ramakrishnan²
Indiana University School of Medicine¹; Department of Otolaryngology at Indiana University School of Medicine²

Background and Hypothesis:

Chronic rhinosinusitis (CRS) is defined as persistent inflammation of the mucosa of the nose and paranasal sinuses, either with or without nasal polyps. The pathophysiology of CRS is thought to occur due to a dysfunction of the immune response leading to prolonged NF- κ B signaling. Many chronic diseases like CRS have been shown to have chronic NF- κ B dysregulation. One hypothesis for the persistent inflammation seen in CRS patients is that they have a less robust pro-resolution response that aids in termination of the NF- κ B pathway. In this study, we sought to validate our previous results from nasal polyp tissue using qPCR for key inflammatory mediators, CXCL1, CSF3, and myd88.

Methods: Human CRS nasal polyp tissue was collected during functional endoscopic sinus surgery to be grown in cell culture. The nasal polyp tissue was grown in 10 ug/ml of LPS to mimic gram-negative conditions commonly seen in CRS. Tissue cDNA was extracted and frozen at -80° C. Tissue cDNA for control, RvD2, LPS, and LPS+RvD2 was thawed and used to run qPCR for myd88, CXCL1, and CSF3.

Results: qPCR data was normalized using GAPDH and B-actin. When normalized with GAPDH and B-actin, CSF3 was found to be downregulated with RvD2 exposure, while both myd88 and CXCL1 showed inconsistent results. Downregulation of CSF3 with RvD2 exposure, is consistent with our hypothesis that RvD2 plays a role in NF- κ B resolution.

Conclusion: Downregulation of the NF- κ B pathway can play an important role in reducing the chronic inflammation seen in CRS. CSF3 was one gene target of the NF- κ B pathway that was continuously found to be downregulated when nasal polyp tissue was treated with RvD2. Our findings demonstrate that when nasal polyp tissue is treated with pro-resolving mediators such as RvD2, at least one or more of the NF- κ B-associated genes are downregulated.