Tsiklauri N et al., J Clinic Toxicol, 2018, Volume 8
DOI: 10.4172/2161-0495-C1-028

Endocannabinoids CB1 receptor contributes to antinociceptive effects of NSAIDs in the anterior cingulate cortex of rats

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Background & Aims: Pain is characterized as a complex experience, dependent not only on the regulation of nociceptive sensory systems but also on the activation of limbic brain areas. Non-steroidal anti-inflammatory drugs (NSAIDs) are the most widely used analgesics in the treatment of mild pain. Here we investigated a non-opioid induced antinociception in the formalin model of pain and a relation between administration of NSAIDs in the anterior cingulate cortex (ACC) and the endocannabinoid system.

Methodology: We measured nociceptive thermal paw withdrawal latencies and mechanical thresholds in rats following microinjections of NSAIDs, saline or the cannabinoid receptor 1 (CB1) antagonist (AM-251) in the ACC.

Results: We revealed that NSAIDs (diclofenac, ketoprofen, and xefocam) distinctly reduced formalin-induced hyperalgesia in the ACC. When pretreated with AM-251 we found a significant reduction of analgesic effects of NSAIDs in this limbic area.

Conclusions: The present data support the notion that endocannabinoids' CB1 receptor contributes to antinociceptive effects of NSAIDs and probably involved in activation of the descending opioid modulatory system of pain.

Recent Publications:

1. Tsiklauri N et al. (2018) Antinociceptive tolerance to NSAIDs in the anterior cingulate cortex is mediated via endogenous opioid mechanism. BMC Pharmacology and Toxicology. 19(1):2. Doi:10.1186/s40360-017-0193-y.
2. Tsagareli M G et al. (2018) Non-steroidal anti-inflammatory drugs attenuate agonist-evoked activation of transient receptor potential channels. Biomedicine and Pharmacotherapy. 97:745-751. Doi: 10.1016/j.biopha.2017.10.131.
3. Tsiklauri N et al. (2017) Antinociceptive tolerance to NSAIDs in the rat formalin test is mediated by the opioid mechanism. Pharmacol. Reports. 69(1):168-175. Doi: 10.1016/j.pharep.2016.10.004.
4. Nozadze I, Tsiklauri N, Gurtskaia G and Tsagareli M G (2016) NSAIDs attenuate hyperalgesia induced by TRP channel activation. Data Brief. 6:668-673. Doi:10.1016/j.dib.2015.12.055.
5. Nozadze I, Tsiklauri N, Gurtskaia G and Tsagareli M G (2016) Role of thermo TRPA1 and TRPV1 channels in heat, cold and mechanical nociception of rats. Behav. Pharmacol. 27(1):29-36. Doi: 10.1097/FBP.0000000000000176.

Biography

Tsiklauri N has her expertise in the study of tolerance effects induced by NSAIDs after microinjections into several brain structures, improving the knowledge in pain modulation and regulation. She is keenly interested in neurobiology of pain.

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