Stratford Campus Research Day   26th Annual Research Day

May 5th, 12:00 AM

Exploring the Viability of a Microglia Attenuating Treatment Model for Fibromyalgia Patients

Rohan Yarlagadda
Rowan University

Follow this and additional works at: https://rdw.rowan.edu/stratford_research_day

Part of the Musculoskeletal Diseases Commons, Nervous System Diseases Commons, Pathological Conditions, Signs and Symptoms Commons, Rheumatology Commons, and the Therapeutics Commons Let us know how access to this document benefits you - share your thoughts on our feedback form.

Exploring the Viability of a Microglia Attenuating Treatment Model for Fibromyalgia Patients
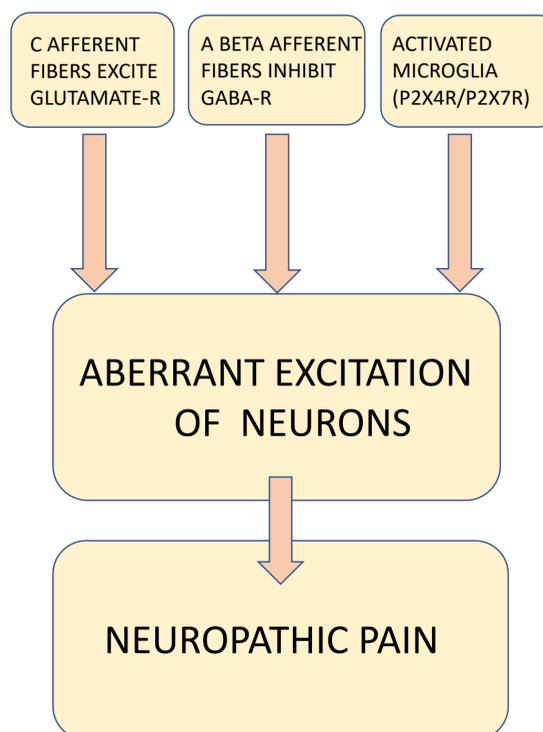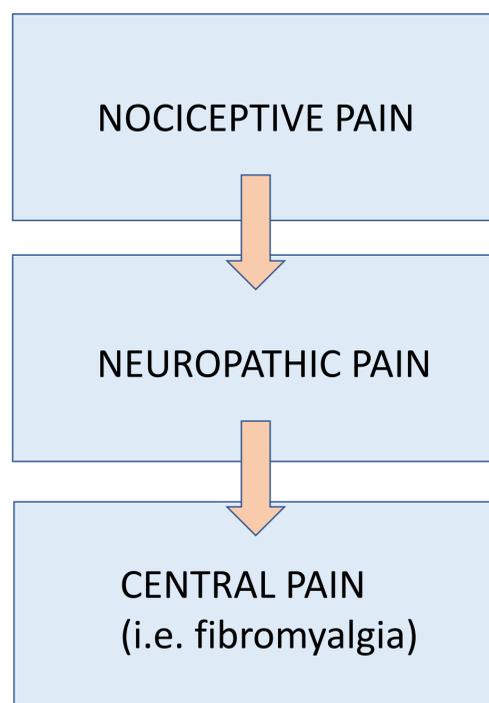
Rohan Yarlagadda[1]
[1]Rowan University School of Osteopathic Medicine
Stratford, New Jersey, 08080, USA

Background

Fibromyalgia refers to a rheumatic condition experienced as pain all over the body without a specific cause. This is considered a diagnosis of exclusion. This classification seems to suggests that any treatment options for it are purely symptomatic and are not disease targeted. Its complex diagnosis and underlying pathology contribute to the challenge of medically addressing fibromyalgia. Without a strict cause, fibromyalgia is often treated symptomatically with CBT and SNRIs. However, recent research suggests that existing therapeutic approaches are not very effective, especially when considering long term benefits for this chronic condition. This beckons for novel treatment options for these patients. Microglia have been implicated in previous studies for their role in neuropathic pain mechanisms. By considering recent advances in our knowledge of microglia, this research aims to determine the involvement of microglia in fibromyalgia pathology to hopefully identify a novel treatment target.

Objectives

This research aims to explore the role of microglia in fibromyalgia pathophysiology with the intention of suggesting a novel treatment option for fibromyalgia patients that is disease modifying instead of symptomatic.

NOCICEPTIVE PAIN

↓

NEUROPATHIC PAIN

↓

CENTRAL PAIN
(i.e. fibromyalgia)

C AFFERENT FIBERS EXCITE GLUTAMATE-R | A BETA AFFERENT FIBERS INHIBIT GABA-R | ACTIVATED MICROGLIA (P2X4R/P2X7R)

↓ ↓ ↓

ABERRANT EXCITATION OF NEURONS

↓

NEUROPATHIC PAIN

Methods

A review was conducted using secondary analysis to investigate the efficacy of microglia-attenuating treatment models in treating neuropathic pain conditions, with emphasis on fibromyalgia. Data collection was done by performing searches on the national scientific database, PubMed. A variety of keywords were used to narrow down research associated with microglia and fibromyalgia. Certain search terms were used such as "microglia AND fibromyalgia", "microglia-based treatment", "central sensitization AND neuropathic pain" and "microglial attenuation AND neuropathic pain" were used to isolate relevant information to the research topic. MeSH Terms were utilized and implemented into search criteria when appropriate. Special emphasis was placed on search results between the years 2020-2022. Information on microglial activation, attenuation models, and involvement in mechanisms was extracted.

Results

Studies have shown that a combination of melatonin and folic acid could significantly reduce behavioral effects and oxidative stress in a fibromyalgia model that also showed significant reduction in microglia activation. Minocycline, which was shown to reliably ameliorate microglial activity, was shown to attenuate mechanical hyperalgesia and allodynia. Purinergic receptor antagonist Brilliant Blue G could inactivate microglial through P2X7R block and attenuate microglial activation and pain related behaviors. These findings highlight that microglia may have a role in the pathology underlying fibromyalgia and may be an important consideration as a therapeutic target.