

Regular exercise beneficial in suppressing inflammation in rheumatic disease

12 June 2014

Research findings presented today at the European League Against Rheumatism Annual Congress (EULAR 2014) suggest that exercise transiently suppresses local and systemic inflammation, reinforcing the beneficial effects of exercise and the need for this to be regular in order to achieve clinical efficacy in rheumatic disease.

Chronic inflammation, swelling and pain in the joints characterise the more than 200 rheumatic diseases. Persistent inflammation over time can damage affected joints, but previous research has established that exercise can decrease joint inflammation in rheumatoid arthritis.

These new research findings focused on the physiological changes created by exercise and their impact on inflammation. The researchers have found that exercise generates a true biological response and induces changes on a molecular level that stimulate anti-inflammatory effects.

"As the inflammatory process in rheumatic diseases is a major cause of disability, we are excited to uncover the process by which exercise works on a molecular level to decrease this inflammation. Our results show the benefits that exercise could have in decreasing the great burden of rheumatic diseases. They also highlight the need for frequent exercise in order to create clinically significant results," said Dr. Nicholas Young, presenting author from The Ohio State University Wexner Medical Center, Columbus, Ohio, US.

This in-vivo study measured the regulation and activation of NF-kB* in mice. NF-kB, a protein complex that controls many genes involved in inflammation, is found to be chronically active in many inflammatory diseases, such as [inflammatory bowel disease](#) and arthritis.

An inflammatory response was created in mice both before and after exercise through an injection of lipopolysaccharide† (LPS). The impact of exercise was measured over time following the inflammatory response.

There was a strong systemic and local [inflammatory response](#) upon injection of LPS, which was strongest at 2 hours post-injection. NF-kB activation was seen as a result of the LPS and was detected in lymphatic tissues throughout the mouse. In those groups where mice were exercised pre- and post-LPS injection, the NF-kB activation was significantly inhibited in whole-body systemic analysis.

The effect of exercise on the inhibition of NF-kB activation was identified as a transient effect, lasting only 24 hours after exercise.

The role of [exercise](#) in inhibiting NF-kB activation was linked to the suppression of multiple pro-inflammatory cytokines. Cytokines are produced by a wide range of cells including macrophages and are involved in cell signalling.

Rheumatic disease is a term used to describe over 200 conditions characterised by [inflammation](#), swelling and pain in the joints or muscles. They are leading causes of morbidity and disability, giving rise to enormous healthcare expenditures and loss of work.

More information: Abstract Number: OP0109

1 Blazek A, Knapik D, Young NA et al. Exercise suppresses systemic inflammation via inhibition of NF-KB activation in monocytes. EULAR 2014, Paris. OP0109

2 Monaco C, Andreakos E, Kiriakidis S, et al. Canonical pathway of nuclear factor kappa B activation selectively regulates proinflammatory and prothrombotic responses in human atherosclerosis. Proc. Natl. Acad. Sci. U.S.A 2004; 101(15): 5634

3 World Health Organization. Chronic Rheumatic Conditions. www.who.int/chp/topics/rheumatic/en/ [Accessed 05/06/2014]

* NF- κ B is known in full as nuclear factor kappa-light-chain-enhancer of activated B cell

† Bacterial cell wall components that elicit a strong immune response

Provided by European League Against Rheumatism

APA citation: Regular exercise beneficial in suppressing inflammation in rheumatic disease (2014, June 12) retrieved 21 November 2019 from <https://medicalxpress.com/news/2014-06-regular-beneficial-suppressing-inflammation-rheumatic.html>

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