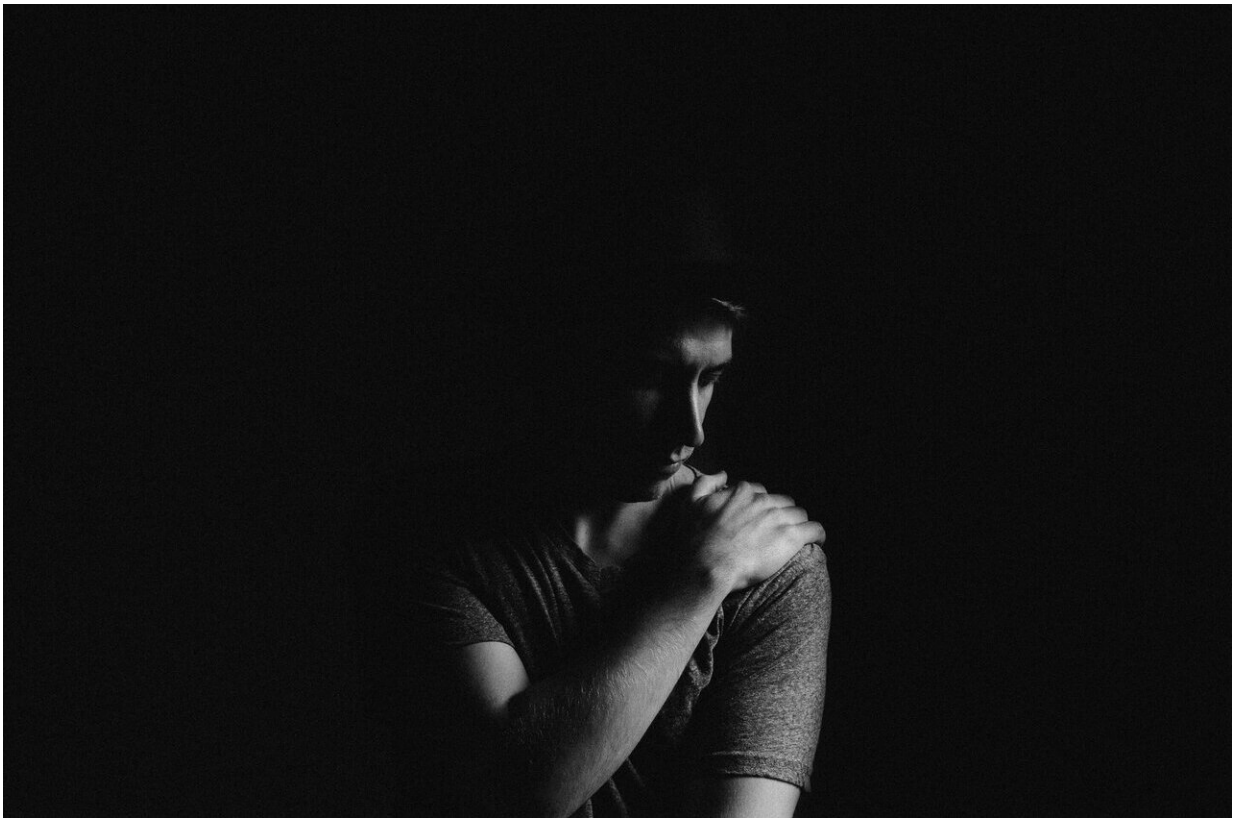
Investigating the link between antibiotic use and inflammatory pain reduction

October 18 2021



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Glenn Stevenson, Ph.D., professor of psychology within the School of Social and Behavioral Sciences at UNE, recently published a paper on gut microbiome modulation of inflammatory pain.

The paper, "Effects of vancomycin on persistent pain-stimulated and pain-depressed behaviors in female Fischer rats with or without voluntary access to running wheels," was published in *The Journal of Pain*, which is the journal of The United States Association for the Study of Pain.

The research paper examines the impact of antibiotics on the gut microbiome and how antibiotic use can alter inflammatory pain in subjects with or without access to exercise.

According to Stevenson, this is the first publication to assess how antibiotic-induced changes to the gut microbiome impact inflammatory pain distal to the gut (in the limbs, for example), using behavioral procedures developed in the Stevenson Lab.

Results from this study indicate that the glycopeptide antibiotic vancomycin decreases pain-related behaviors and that manipulation of the gut microbiome may be one method to attenuate inflammatory pain amplitude. Additionally, results indicated that a causal mechanism for this reduction in pain may be due to an antibiotic-induced shift in gut amino acid concentrations.

The research for this study took four years to complete, Stevenson said, adding that the link between amino acids and pain reduction is "highly novel."

"This is another example of the high-quality, high-impact research that our UNE undergraduate students are engaged in daily," Stevenson said. "These co-authorships go a long way toward securing post-graduate positions for our students."

Stevenson also spoke of the interprofessional nature of the research.

"This publication represents a highly interdisciplinary research team with expertise in genomics, proteomics, metabolomics, pharmacology, psychology, neuroscience, microbiology, and virology," he commented. "When you put all these disciplines together to solve a single problem, you end up doing innovative, creative, and significant work. The main ideas for this research were generated in meetings between me, Meghan [May] and Tamara [King]. I then reached out to Penn and Children's Hospital researchers who subsequently joined our group, and the rest is history."

More information: Emily Payne et al, Effects of Vancomycin on Persistent Pain-Stimulated and Pain-Depressed Behaviors in Female Fischer Rats With or Without Voluntary Access to Running Wheels, *The Journal of Pain* (2021). DOI: 10.1016/j.jpain.2021.05.003

Provided by University of New England