

Obsessing over strep throat in kids

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A common infection in children, strep throat can lead to problems with a child's heart, joints or brain if left untreated. And when the brain is involved, motor and mental functioning may be compromised, leading to syndromes such as attention deficit disorder and obsessive-compulsive disorder (OCD).

While scientists have speculated on a link between OCD and childhood infections like strep for more than two decades, Prof. Daphna Joel and her team of researchers at Tel Aviv University's Department of Psychology have now scientifically demonstrated that strep can lead to [brain](#) dysfunction and OCD. Dr. Joel says their breakthrough could lead to [new drugs](#) for treating OCD, and may in the future prevent the psychiatric disorder altogether.

Conducted by the PhD student Lior Brimberg and in collaboration with Prof. Madelaine W. Cunningham of the University of Oklahoma, the research, recently presented at the 13th Congress of the European Federation of Neurological Societies in Florence, Italy, is expected to be published by the beginning of next year.

How strep attacks the brain

"It's almost impossible to show how strep can lead to OCD in humans — almost all of us, even very young children, have been exposed to the bacterium at one time or another," says Prof. Joel. "But childhood seems to provide a distinct window of opportunity for the disorder to take root through strep infection," she warns.

Working with the world's leading specialist in strep-related heart disease, Prof. Cunningham, the researchers developed a new animal model to show how exposure to strep affects the brain and leads to a number of physical and mental ailments.

In her Tel Aviv University laboratory, Prof. Joel and her student, Lior Brimberg, created an animal model using rats exposed to the strep bacteria. Comparing them to a strep-free control group, Prof. Joel measured a distinct difference in behavior in the strep-exposed animals.

First, the strep-exposed rats developed a strep antibody which deposited in their brain, confirming the suspicions of previous researchers. Those exposed also developed balance and coordination difficulties, as well as compulsive behaviors such as increased and repetitive grooming.

More important, they also found that the strep antibody binds itself to dopamine D1 and D2 receptors in the brain. This finding is in harmony with the fact that one of the main drugs for treating Sydenham's Chorea, a motor disorder associated with strep, targets these same dopamine D2 receptors.

"We were able to show that these antibodies are binding to receptors in the brain and changing the way certain neurotransmitters operate, leading to brain dysfunction and motor and behavioral symptoms," Prof. Joel says.

Prevention before the cure

This breakthrough finding could lead to new modes of diagnosis of the disease and provide a new platform for drug developers seeking to treat or cure OCD.

According to the American Academy of Child and Adolescent

Psychiatry, OCD affects up to 2% of all children and adolescents in the U.S. The disorder is characterized by recurrent intense obsessions and/or compulsions that may cause severe discomfort, anxiety and stress, and interfere with day-to-day functioning.

Prof. Joel stresses how important it is for parents who notice signs of strep throat to ensure that their children get treated with the appropriate antibiotics in a timely fashion.

Strep-induced OCD will likely continue to be a major problem in the developing world where strep is not treated adequately, she concludes.

Provided by Tel Aviv University

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