

Study: Resiniferatoxin may increase sepsis-related mortality

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Pain researchers from the Sheikh Zayed Institute for Pediatric Surgical Innovation at Children's National Medical Center have discovered that resiniferatoxin, a drug that has shown early promise as an option for chronic, severe pain sufferers, may decrease the body's ability to fight off bacterial infections, particularly sepsis.

The study, which appears in the May 1 edition of the journal *Anesthesiology*, sheds new light on the role of a pain receptor, transient receptor potential vanilloid-1 (TRPV1), and how medications designed to impact this receptor's relay of the pain sensation to the brain might work in humans.

Scientists, led by Zenaide Quezado, MD, director of the Pain Neurobiology Laboratory of the Sheikh Zayed Institute for Pediatric Surgical Innovation at Children's National, studied in animal models the effects of two different medications, resiniferatoxin and capsazepine, that are known to impact TRPV1, an ion receptor channel that signals sharp, painful stimuli to the brain, and triggers a pain response. These drugs block the activation of the TRPV1 receptor in different ways. For example, resiniferatoxin binds to the TRPV1 receptor and as a result opens calcium channels and ultimately destroys the nerves that have the receptor. The team discovered that, in the case of resiniferatoxin, the chemical reaction also negatively impacts the body's reaction to bacterial infections by altering cytokine and chemokine expression, signaling molecules which are key to the natural [immune response](#) to bacteria.

Resiniferatoxin shows great promise to ease chronic pain by targeting that pain in an entirely new way. If successful, it may allow patients who suffer from long-term diseases and who cannot benefit from traditional pain management medications, respite. As a result, the National Institutes of Health are undertaking a series of clinical trials in humans to determine its effectiveness.

"Our job as [pain medicine](#) researchers is to try and uncover as much about these medications and side effects as possible so that we can monitor and treat those side effects," said Dr. Quezado, senior author of the study and a pediatric anesthesiologist. "This study alerts us to a possible side effect of resiniferatoxin that might impact when and how the drug is used. However, for many patients, the chance to finally ease long term [pain](#) caused by diseases such as cancer may outweigh a risk that the medication may impact their body's ability to heal from [bacterial infection](#)."

Provided by Children's National Medical Center

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