

Arginine therapy shows promise for sickle cell pain

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Arginine therapy may be a safe and inexpensive treatment for acute pain episodes in patients with sickle cell disease, according to results of a recent clinical study. The study was the first randomized placebo-controlled study to demonstrate benefits of arginine therapy in children with sickle cell disease hospitalized for severe pain.

Sickle cell disease is an inherited condition in which the body makes [red blood cells](#) containing abnormal hemoglobin, the protein that carries oxygen from the lungs to other cells in the body. This abnormal hemoglobin (hemoglobin S) causes red blood cells to distort into a sickle, or crescent shape that often blocks blood flow in small blood vessels, leading to pain and [organ damage](#).

An acute deficiency of nitric oxide in sickled red blood cells contributes to the episodes of blocked vessels and pain. Since the amino acid arginine is a building block of nitric oxide, researchers hypothesized that arginine could be a beneficial treatment for pain related to sickle cell disease.

Previous research found that a single dose of arginine given to sickle cell patients with [acute pain](#) episodes resulted in a significant dose-dependent increase in plasma nitric oxide.

Building on that knowledge, the current research study was a randomized, double blind clinical trial of 38 children with sickle cell disease hospitalized for 56 episodes of pain. The research team

discovered a 54 percent reduction in the use of pain medication and significantly lower [pain scores](#) at [hospital discharge](#) in those treated with arginine over those receiving placebo.

The results were published in the journal *Haematologica*. First author was Claudia R. Morris, MD, assistant professor of pediatrics at Emory University School of Medicine. She conducted the study while in her previous position at Children's Hospital and Research Center in Oakland, CA, with senior author Elliott P. Vichinsky, MD.

"Episodes of pain due to vaso-[occlusion](#) are the leading cause of [hospital admission](#) and emergency room visits and are associated with increased mortality, yet there is no effective therapy targeting the underlying cause," says Morris. "Treatment consists only of symptom relief with pain medicines and hydration. There is an urgent need for new therapies for acute sickle cell pain, and a greater than 50 percent reduction in use of [pain medication](#) was a remarkable finding."

The study found no problems with safety in the use of arginine therapy. Although the treatment did not result in a significantly shorter length of stay in the hospital, the researchers believe delivering the study drug as early as possible in the emergency department or clinic may have a greater impact on length of stay, since many patients received their first dose of medication more than 24 hours after presenting at the hospital.

A large, multi-center trial is warranted in order to confirm these observations and test the effects of delivering the therapy sooner, they note in the published paper.

Provided by Emory University

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