

Sickle cell patients given Lactated Ringer's solution for pain improve more easily than those given normal saline

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Credit: National Institutes of Health

Sickle cell disease is a common genetic disorder characterized by periodic occurrences of pain that occur repeatedly throughout life. These episodes, referred to as vaso-occlusive episodes, happen when sickled cells obstruct blood vessels. The degree of pain may range from a mild

discomfort to a severe disabling pain for which the person needs treatment in hospital.

A new study by researchers at Boston University Chobanian & Avedisian School of Medicine, Boston Medical Center's (BMC) Center of Excellence in Sickle Cell Disease, along with the Boston University Evans Center for Implementation and Improvement Science, has found that hospital-admitted patients who received the fluid Lactated Ringer's, a solution used to replace water and electrolyte loss in patients with low blood volume or [low blood pressure](#), rather than normal saline, had shorter hospital lengths of stay, fewer readmissions to the hospital, and fewer days of intravenous opioid medications for [pain](#) control.

These findings [appear](#) in *JAMA Internal Medicine*.

"Currently, patients with [sickle cell disease](#) who are admitted to the hospital for vaso-occlusive pain episodes usually receive normal saline and clinical decision support tools presently recommend normal saline. However, our results call these recommendations and current practice into question," says corresponding author Nicholas Bosch MD, MSc, assistant professor of medicine at the school.

Researchers used a large database that included patient data from more than 1,000 U.S. hospitals. They identified patients with sickle cell disease and vaso-occlusive pain episodes who started on Lactated Ringer's solution or normal saline on the first day of hospitalization. They then used machine learning models to compare the rates of outcomes between the two.

They found those who were given Lactated Ringer's had more hospital-free days, shorter hospital length of stay and a lower 30-day readmission risk compared to those who received normal saline.

According to the researchers, patients with sickle cell disease admitted with vaso-occlusive [episodes](#) are high utilizers of inpatient [medical services](#) and have frequent readmissions for additional care.

"We believe switching from normal saline to Lactated Ringer's will not only improve outcomes for our patients, but also potentially lower health care costs," said Bosch, a pulmonologist at Boston Medical Center.

Typically, a [randomized trial](#) would be used to compare these fluid types, but Bosch said that would require a prohibitively large number of participants to enroll; a number that has never been reached in any clinical trial related to sickle cell disease. Instead, the research team used large observational datasets and machine learning models to duplicate the randomized trial that was prohibitively large to conduct.

"Our results provide strong evidence that a change in standard practice is needed," adds Bosch.

More information: Augusta K. Alwang et al, Lactated Ringer vs Normal Saline Solution During Sickle Cell Vaso-Occlusive Episodes, *JAMA Internal Medicine* (2024). [DOI: 10.1001/jamainternmed.2024.4428](#)

Provided by Boston University School of Medicine

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