Hydroxyurea significantly reduces infections in children with sickle cell anemia

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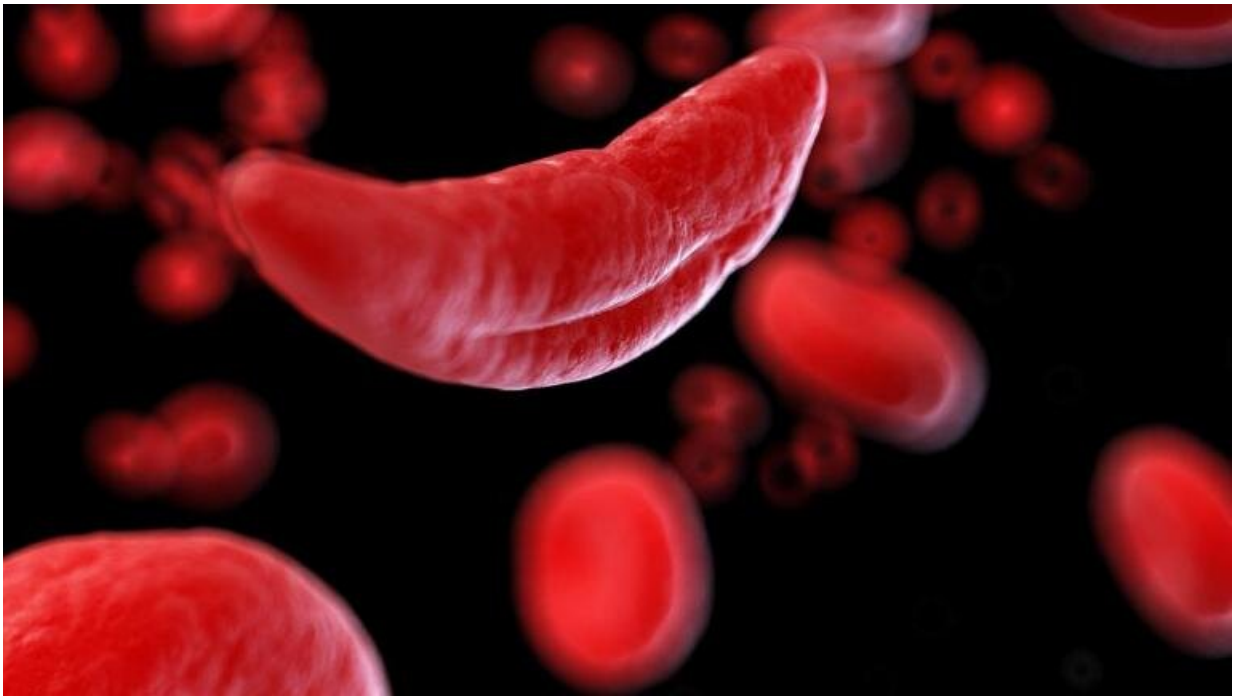

Credit: National Institutes of Health

Clinical research led by Indiana University School of Medicine investigators and their collaborators in Uganda has revealed that hydroxyurea significantly reduces infections in children with sickle cell anemia. Their latest findings enhance strong evidence of hydroxyurea's effectiveness and could ultimately reduce death in children in Africa, the continent most burdened by the disease.

The group's research, recently published in the journal *Blood*, revealed that hydroxyurea treatment resulted in a remarkable 60% reduction in severe or invasive infections, including malaria, bacteremia, respiratory tract infections and gastroenteritis, among Ugandan children with sickle cell anemia.

"Our investigation provides powerful justifications for hydroxyurea's use in children with sickle cell anemia in Africa," said Dr. Chandy John, the Ryan White Professor of Pediatrics at IU School of Medicine and co-lead investigator of the latest study. "Given the high rates of infection in this region, we hope our evidence will encourage ministries of health to continue supporting and expanding access to hydroxyurea for young patients who can greatly benefit from the treatment."

Sickle cell anemia is a genetic blood disorder that alters the structure of red blood cells and affects oxygen distribution throughout the body, increasing susceptibility to serious health complications and life-threatening infections. According to the World Health Organization, more than 300,000 children worldwide are born with sickle cell disease each year, with a high prevalence found in African countries.

While hydroxyurea has had U.S. Food and Drug Administration approval as a sickle cell disease treatment for children since 2017, its accessibility and acceptance in Africa have been comparatively limited. As hydroxyurea has become more recognized in African countries for its efficacy in treating sickle-cell-related complications, John and his colleagues noticed a knowledge gap about the treatment's effect on infections. This led the research group to incorporate hydroxyurea treatment and analysis into their established clinical trial, Zinc for Infection Prevention in Sickle Cell Anemia.

During the study, the researchers examined the effects of hydroxyurea on 117 children in Uganda and focused on a range of infections. After

hydroxyurea treatment, results showed a substantial decrease in the incidence of these infections. Additionally, eight of the nine deaths that occurred in the trial were children whose parents declined hydroxyurea treatment. The only death in a child on hydroxyurea treatment occurred four days after starting treatment, providing insufficient time for hydroxyurea to have an effect.

Of the five children for whom a cause of death was known, all five died of infectious causes. The high death rate in the study, despite expert clinical care by study personnel, provides further evidence of the urgent need for additional interventions to decrease mortality in children with sickle cell disease in Africa.

"Infections commonly precede other complications related to sickle cell anemia and often result in hospitalizations that can lead to death," said Dr. Ruth Namazzi, site principal investigator, first author on the study and a lecturer in the Department of Pediatrics and Child Health at Makerere University in Uganda. "We believe incorporating hydroxyurea treatment as the standard of care for sickle cell anemia across Africa will not only reduce infections but will more importantly save countless lives."

More information: Ruth Namazzi et al, Hydroxyurea reduces infections in children with sickle cell anemia in Uganda, *Blood* (2024). DOI: 10.1182/blood.2023021575

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