Rigorous study finds widely used treatment for infection fails young cancer patients

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From left to right: Kristen Branum, Patricia Flynn, Dr. Joshua Wolf and Kim Allison. Credit: St. Jude Children's Research Hospital

A treatment designed to reduce bloodstream infections due to central

venous catheters that had worked well in lab studies and is commonly used around the world, but had not been rigorously tested, failed to protect young cancer patients from recurring or new infections and left them at higher risk for complications. St. Jude Children's Research Hospital investigators led the study, which appears online today in the journal *The Lancet Infectious Diseases*.

The study focused on the effectiveness of ethanol-lock therapy for treatment and prevention of bloodstream infections and related complications in pediatric cancer patients with central venous catheters, known as central lines.

Central lines are surgically implanted and connected to the bloodstream, making it easier to draw blood and deliver chemotherapy, fluids and other treatments without repeated needle sticks. But about 25 percent of pediatric cancer patients develop central line-associated bloodstream infections that disrupt cancer treatment and sometimes result in hospitalization, long-term complications or death. Despite antibiotic therapy, one-third of patients develop persistent or multiple infections and even more patients undergo additional surgery to replace central lines.

"Ethanol-lock therapy works in the laboratory to kill even tough-to-eradicate bacterial communities called biofilm," said first and corresponding author Joshua Wolf, MBBS, an assistant member of the St. Jude Department of Infectious Diseases. "We knew anecdotally that ethanol-lock therapy is used at many hospitals in an effort to prevent new or recurring central line bloodstream infections in children with cancer."

But in a double-blind, randomized placebo-controlled clinical trial of children and young adults with cancer and blood disorders, Wolf and his colleagues found ethanol-lock therapy was no better than saline solution

(placebo) at preventing new or repeat bloodstream infections. It was also no better than placebo at reducing central line replacement surgeries.

Worse, patients who received ethanol therapy were 2.5-times more likely than patients in the placebo group to develop catheter blockages that required treatment with blood thinners.

"Based on these results, ethanol-lock therapy should not be routinely used in children with cancer or hematologic disorders," Wolf said. "Serious bacterial infections remain a life-threatening problem that is the focus of intensive ongoing research."

The study included 94 patients being treated at St. Jude and in Australia at the Royal Children's Hospital, Melbourne. The patients were all receiving antibiotics for treatment of central line-associated bloodstream infections. The patients were randomly assigned to the same six-month schedule of central line treatment with either 70 percent ethanol solution or saline solution.

About 44 percent of patients in both groups developed new or recurring infections or required surgical replacement of central lines. In addition, 58 percent of patients in the ethanol group needed blood-thinners to open blocked central lines compared to about 33 percent in the placebo group.

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