MedicalXpress

More central line infections seen in children with cancer once they leave the hospital

July 24 2013

Pediatric cancer patients whose central lines are used to treat them at home develop three times as many dangerous bloodstream infections from their devices than their hospitalized counterparts, according to the results of a new Johns Hopkins Children's Center study.

Findings of the research, reported online July 23 in the journal *Pediatric Blood & Cancer*, provide valuable insight into the safety of central line uses outside the hospital and underscore the need to carefully evaluate the benefits and risk of sending a child home with one, the investigators say.

Furthermore, the results highlight the importance of better understanding the risks of at-home central line care and designing infection-prevention strategies.

"The health care system as a whole has spent a lot of time and energy studying hospital acquired bloodstream infections and has made serious progress in reducing their burden as a result. It is now time that we did the same for central line infections acquired outside the hospital," says lead investigator Michael Rinke, M.D., Ph.D., a pediatrician and safety expert at Johns Hopkins Children's Center.

"Some children with central lines do well at home and will have no complications, but based on our findings, we feel clinicians should remain vigilant when sending home certain special categories of pediatric cancer patients who face higher infection risk by virtue of their

condition, device type or a combination of the two," Rinke adds.

A central line, or a central venous catheter, is a tube placed into a major blood vessel in the neck, chest or groin to serve as a temporary portal for injected medications and fluids. Inserted incorrectly, mishandled or simply handled too frequently, the central line can become a gateway for bacteria into the bloodstream, which can lead to serious complications, including organ damage and even death. Beyond the human toll, each infection can cost up to $45,000 in additional treatment, research has shown.

The study followed 319 children with cancer treated at Johns Hopkins who had central lines and received treatment between 2009 and 2010. Nearly all children were treated in the hospital at some point and sent home thereafter. In hospitalized children, there were 19 bloodstream infections over 8,682 days spent with a central line, compared with 55 such episodes over 84,705 days in the at-home group—or nearly three times the number of infections seen in hospitalized children.

"We have a wealth of data on the safety of central lines among hospitalized children and have designed solid protocols to reduce the risk of invasive bloodstream infections among such children, but we don't really have a good understanding of central line safety once the child leaves the hospital," says senior investigator Marlene Miller, M.D., M.Sc., director of Pediatric Quality and Safety at Johns Hopkins Children's Center. "Our study sheds some light on that issue."

Rinke and colleagues say several potent risk factors for infection emerged among children treated at home. Patients with recently placed central lines, those with recent bone marrow transplants and those with past infections were at highest risk, the study found. In addition, children with a type of central line tunneled under the skin that remains open, rather than implanted, in the chest, were found to be at greatest risk for

infection. But because this type of central line is handled more frequently, it remains unclear whether the increased risk stems from the frequency of access or from the anatomic positioning of the device itself, the researchers say.

The investigators emphasize that central line care, even in the hospital, requires experienced clinicians and trained family members familiar with infection-prevention protocols—a level of care that is not always taught to families before the patient is discharged home.

"Teaching family members the 101 of central line cleaning and care can go a long way toward reducing infection risk and is something that should become part of the formal discharge routine in each and every hospital," Rinke says.

Such instructions, he adds, have been part of the Johns Hopkins Children's Center discharge protocol since 2010.

Provided by Johns Hopkins University School of Medicine