For Children Discharged after Hospitalization for Serious Bacterial Infections, Are Orally Administered Antibiotics as Effective as Antibiotics Given Intravenously through a PICC?

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What was the research about?
Children hospitalized for a severe infection often need to continue to take antibiotics after they go home. In this study, the research team wanted to learn if antibiotics taken by mouth work as well as those given through an IV peripherally inserted central catheter, or PICC. A PICC is a thin tube put into a vein in the upper arm. The PICC reaches into a large vein near the heart. The research team also wanted to

- See how often there were problems from the PICC. For example, the tube could break or become clogged or infected.
- Compare how often side effects occurred with each way of giving the antibiotics. Side effects could include a rash, stomach pain, or nausea.

The team looked at medical records from children who had been in the hospital for a bone infection, severe pneumonia, or a burst appendix.

What were the results?
Antibiotics taken by mouth worked as well as those given through a PICC. Problems from the PICC were common. Side effects also occurred more often with a PICC than with antibiotics taken by mouth.

Children with a PICC were more likely to go to the emergency department, or ED. They were also more likely to end up back in the hospital. The reason was usually problems from the PICC.

Who was in the study?
The research team looked at medical records from 8,762 children in the United States. The children were between 2 months and 18 years of age. They had been in the hospital with a severe infection: 2,060 had a bone infection, 2,123 had severe pneumonia, and 4,579 had a burst appendix. The research team didn’t look at records from children with these health problems who also had other serious health problems.

- Of the children with a bone infection, 51 percent were male, 63 percent were white, 18 percent were black, and 18 percent were Hispanic. Most were between the age of 5 and 13. The most common infection sites were the pelvis, thigh, lower leg, ankle, and foot.
- Of children with severe pneumonia, 59 percent were white, 16 percent were black, and 7 percent were Asian or Native American. The average age was five.
• Of children with a burst appendix, 61 percent were male. Fifty-five percent were less than 10 years of age.

What did the research team do?
The research team looked at medical records from 38 children's hospitals over four years. The team compared children who took antibiotics by mouth after leaving the hospital with those who had a PICC. The team wanted to see

• How often the antibiotics did not get rid of the infection
• How often problems resulted from the PICC
• How often the children had side effects
• How often a child had to go to the ED or return to the hospital because of problems from the PICC or side effects

A parent from a hospital family advisory council helped the research team decide what to look for in the study.

What were the limits of the study?
The medical records only showed when children went to the ED of the original hospital or were put back in that hospital. They didn't show when children went to a doctor's office or another hospital. Thus, the study may not have counted all the times children taking antibiotics by mouth had side effects. Also, the type of antibiotic, not whether it was given by mouth or through a PICC, may affect whether there are side effects.

Future research could compare different types of antibiotics to see if one works better than others. Researchers could also look at how long children need to take the antibiotics.

How can people use the results?
When children have a severe infection, their doctors and families can use these results to decide whether to give antibiotics by mouth or through a PICC after leaving the hospital.

To learn more about this project, visit www.pcori.org/Keren102.