

Study sheds light on deadly GI disease in infants born with complex congenital heart disease

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Infants born with complex congenital heart disease are not only at risk for serious heart-related complications, but also for developing a deadly bowel disease, regardless of the type of surgical intervention they receive for their heart. These are the findings from a study by Nationwide Children's Hospital, and appearing in *Pediatric Critical Care Medicine* published online May 6 ahead of print.

Necrotizing [enterocolitis](#) (NEC) is one of the most common and most life-threatening gastrointestinal diseases in newborn infants and involves inflammation that can destroy the intestine. While premature infants are at especially high risk for developing NEC, the bowel disease is also significantly more common in late preterm and term neonates with congenital heart disease.

"NEC and congenital heart disease are two distinct disease processes, but they appear to be inter-related, particularly in patients with the congenital heart condition known as hypoplastic [left heart syndrome](#)," said Wendy Luce, MD, the study's lead author and principal investigator in the Center for Perinatal Research at Nationwide Children's Hospital.

Research has shown that neonates undergoing the Norwood surgery for hypoplastic left heart syndrome (HLHS) have the highest risk for NEC of all congenital heart disease patients.

The hybrid approach has been developed at Nationwide Children's as an alternative strategy to the Norwood procedure for the management of HLHS and other forms of complex congenital heart disease. The hybrid approach shifts the risk of major [open heart surgery](#) and cardiopulmonary bypass to later in infancy. The incidence of NEC in patients undergoing the hybrid procedure has not been evaluated.

"Since both the Norwood and hybrid procedures have been shown to be effective in treating the immediate dangers associated with complex congenital heart diseases, it's important that we begin to compare the secondary outcomes and quality of life measures related to both surgical approaches," said Dr. Luce, also an assistant professor of Pediatrics at The Ohio State University College of Medicine.

In the study, Dr. Luce and colleagues from The Heart Center at Nationwide Children's Hospital evaluated charts of 73 patients who underwent hybrid stage I procedure for the treatment of complex congenital heart disease at Nationwide Children's during a six-year period.

Of these 73 patients, 11 percent developed moderate to severe NEC post-operatively, an average of eight days after surgery.

This percentage is similar in neonates undergoing the Norwood procedure. However, only two of the Nationwide Children's patients required abdominal surgery for NEC, compared to nearly 60 percent of patients documented in other reports.

"Our early and aggressive treatment of neonates with symptoms of NEC in this high risk population appears to be warranted and may contribute to the relatively low need for abdominal surgery in this patient population," said Dr. Luce.

To help identify risk factors associated with NEC and this patient

population, the investigators examined pregnancy factors such as mother's age and history of prenatal care; pre-surgical factors such as ventilation at the time of the procedure and maximum dose of prostaglandin infusion - a medicine required to maintain blood flow to the body in patients with HLHS and other forms of complex congenital heart disease that result in decreased or no blood flow to the body - ; and factors related to the surgery including patient's age on the day of surgery and the mode in which the vascular stent was placed during the procedure. Of all of the factors they compared, only three were significantly associated with NEC - babies who were born fewer than 37 weeks gestational age, those who received a lower maximum dose of prostaglandin infusion, and those who had an unexpected readmission to the intensive care unit.

Dr. Luce says that although the study's findings can't be immediately generalized to other patients with congenital heart disease, the data reinforces the belief that clinicians should continue to be watchful for NEC in neonates undergoing surgery for [congenital heart disease](#). Also, multidisciplinary approaches to feeding regimens in these high-risk patients are needed to improve outcomes and quality of life.

Provided by Nationwide Children's Hospital

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