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NEWS

RSNA Press Release

Color Doppler Sonography Speeds Detection of Serious Illness in Premature Infants

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At A Glance

- Color Doppler sonography (CDS) can provide early detection of dead bowel in necrotizing enterocolitis (NEC), an inflammatory bowel disease that is potentially fatal.
- NEC is the most common and serious gastrointestinal disorder among hospitalized premature infants.
- In adults, CDS could also benefit patients with bowel disorders like Crohn disease and diverticulitis.

OAK BROOK, Ill. - Measuring blood flow to a newborn's intestines using a special form of ultrasound can help radiologists identify a life-threatening complication in a serious bowel disease, according to a study in the May issue of the journal *Radiology*.

Necrotizing enterocolitis (NEC) is an acquired inflammatory gastrointestinal disease of unknown cause. It is the most common and serious gastrointestinal disorder among hospitalized premature babies, according to the Nemours Foundation. Symptoms include the inability to feed, abdominal bloating and difficulty emptying the stomach. The small and large intestine may cease to function properly and parts of the intestine can die, possibly leading to bowel perforation and death.

"The prognosis for NEC worsens once bowel perforation occurs," said the study's lead author, Ricardo Faingold, M.D., currently an assistant professor of radiology at McGill University in Montreal. "Earlier detection of necrotic or dead bowel in NEC will improve an infant's chance for survival."

From 2000 to 2002, Dr. Faingold and colleagues at the University of Toronto used color Doppler sonography to examine 30 premature and full-term infants with suspected or proven NEC. Researchers then compared the CDS findings with those from abdominal x-rays. CDS uses high-frequency sound waves to detect and quantify blood flow. When x-rays are used to diagnose dead bowel in NEC, doctors are looking for perforations in the intestine or gas in the abdomen that escapes from these holes. The study results indicated that CDS was more sensitive and specific than x-ray for determining NEC in newborns.

"It's a very simple idea," Dr. Faingold said. "If there is blood flow to the wall of the intestine, that's a good sign. If there is no blood flow, that's bad. It means that particular area of the intestine is dying or is dead. When you see free gas in the x-ray, it may be too late.

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The babies are very sick by then."

Dr. Faingold said CDS can also be used to measure intestinal blood flow in adults, a procedure that could benefit patients with a variety of bowel disorders, including Crohn disease, diverticulitis and ischemic bowel.

To determine what constituted abnormal blood flow in the bowels of infants, researchers first compared the CDS data from the 30 premature and full-term newborns having suspected or proven NEC with a control group of 30 premature and full-term newborns without evidence of intestinal or cardiovascular disease.

The researchers used CDS over other ultrasound procedures because color Doppler shows the presence or absence of blood flow in the intestines and whether that flow is normal, increased or absent. CDS is also noninvasive and free of ionizing radiation.

Unlike x-ray, CDS was also able to detect various stages of NEC based on the type of blood flow to the intestine. This is important because the range in treatment options-from antibiotics to surgery-is based on the severity and progression of the disease.

"This procedure is not intended as a substitute for the x-ray," Dr. Faingold said. "But in the near future, color Doppler sonography will become part of the overall assessment of premature babies."

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"Necrotizing Enterocolitis: Assessment of Bowel Viability with Color Doppler US." Collaborating with Dr. Faingold on this paper were Alan Daneman, M.D., George Tomlinson, Ph.D., Paul S. Babyn, M.D., David E. Manson, M.D., Arun Mohanta, RDMS, Aideen M. Moore, M.D., Jonathan Hellmann, M.D., Charles Smith, M.D., Ted Gerstle, M.D., and Jae Hong Kim, M.D.

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