

Researchers have found that whole milk is as effective a contrast agent as the standard barium suspension given orally to patients undergoing CT of the gastrointestinal tract. Barium cannot compete with milk in cost or taste.

Optimal GI imaging depends on adequate bowel distention. High-attenuation oral contrast media, such as iodine or barium solutions, are used frequently for this purpose on multislice CT exams. Results can be often disappointing, however. Researchers have turned to multiple low-attenuation alternatives, including water, soluble fat, and even air, but these have proved suboptimal, too expensive, or unacceptable to patients.

Recent studies have shown that milk could play a role as a contrast agent. No data existed, however, comparing milk and barium suspensions in terms of effectiveness, cost, and patient tolerance. Encouraging results were rendered from the first study of its kind aimed at answering these questions, said principal investigator Dr. Chi Wan Koo, a radiologist at Columbia University's St. Luke's Roosevelt Hospital Center in New York City.

Koo and colleagues enrolled 215 consecutive patients scheduled for abdominal and pelvic CT from July 2005 to April 2007. All patients received IV contrast media, while 100 of them were given a commercially available 0.1% barium suspension and 115 were given whole milk. Researchers reviewed all images and scored them based on degree of bowel distention and bowel wall visibility. The investigators also assessed the costs related to either procedure and asked patients to respond to a questionnaire about their tolerance of either oral contrast agent. The investigators found that the images from patients who drank whole milk were just as clinically useful as those from patients who received the barium suspension. They published their findings in the *American Journal of Roentgenology* (2008;190:1307-1313).

"We found that milk was less expensive, and it had better patient acceptance and fewer adverse symptoms," Koo said.

The researchers found no statistically significant differences between whole milk and the barium suspension regarding the degree of bowel distention and mural visualization for all segments of bowel studied ($p > 0.05$ for both reviewers). More patients found milk pleasant in taste and preferred it to barium, and this preference was statistically significant ($p < 0.0001$). Adverse side effects included abdominal discomfort, cramping, nausea, and diarrhea. The per-patient cost was \$18 for the barium suspension and \$1.48 for milk.

Whole milk proved to be comparable to barium with respect to bowel distention and bowel wall visualization, however, and it does not require additional drugs for upper GI muscle relaxation.

"Whole milk and 0.1% barium suspension are valuable in the diagnosis of small bowel disorders, such as ischemia, neoplasm, and Crohn's disease," Koo said. "They are also useful in evaluating pancreatic and biliary abnormalities."

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