

## Study: Antibiotics, not surgery, may sometimes better treat appendicitis

April 28 2011, by Margaret Allen

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(Medical Xpress) -- Antibiotics rather than surgery may be the better treatment for cases of appendicitis in which the appendix hasn't burst, according to a new study.

The study's authors say the findings suggest that nonperforating appendicitis, as the disease is called when the appendix hasn't burst, may be unrelated to perforating appendicitis, in which the appendix has burst.

Instead, the study found that nonperforating childhood appendicitis, which historically has been treated with [emergency surgery](#), seems to be a disease similar to nonperforating adult [diverticulitis](#), which is often treated with antibiotics.

"It is assumed, but has never been proved, that appendicitis always perforates unless appendectomy is performed early in its course," said the authors. "There is a growing body of evidence to suggest that this is not the case."

The study, "Epidemiological similarities between appendicitis and diverticulitis suggesting a common underlying pathogenesis," was reported in the [Archives of Surgery](#).

### Hospital discharge records reveal correlation

Childhood appendicitis and adult diverticulitis share many similarities,

including association with colon hygiene and a low intake of fiber in the diet.

Those shared epidemiological features prompted researchers to examine whether the two might be similar, according to economist Thomas B. Fomby at Southern Methodist University in Dallas.

A statistical sampling of data from U.S. hospital discharge records revealed a correlation between nonperforating appendicitis and nonperforating diverticulitis.

"We used a technique called cointegration to investigate common movements in epidemiologic data series," said Fomby, a professor in SMU's Department of Economics, who led the statistical analysis with statistician Wayne A. Woodward, professor and department chair in SMU's Department of Statistical Science.

Lead author on the study was Edward H. Livingston, M.D., in the division of Gastrointestinal and Endocrine Surgery at University of Texas Southwestern Medical School, Dallas; with the Department of Surgery, Veterans Affairs Medical Center Dallas; and in the Department of Bioengineering, University of Texas at Arlington. Also co-authoring was Robert W. Haley, M.D., in the Department of Internal Medicine-Epidemiology, UT Southwestern Medical School, and a past recipient of the SMU Distinguished Alumni Award.

## **Regional and national data move together over time**

The study looked at 27 years of data from the National [Hospital Discharge](#) Survey, which is compiled annually by the Centers for Disease Control and Prevention. The analysis specifically compared national data and regional data for children with appendicitis and adults with diverticulitis who were admitted to U.S. hospitals between 1979 and

2006.

The statistical methodology called panel cointegration allowed the researchers to sift through eight different combinations of the two diseases, both by region and nationally, to see whether they vary together across time and to eliminate the possibility of coincidence or a chance correlation, Fomby said.

"We analyzed all the national data, and then found the same thing in every region also," Fomby said. "That reinforced what we were finding at the national level."

The authors' analysis shows that although the annual incidence rates of adult nonperforating diverticulitis and child nonperforating appendicitis changed greatly during the past 25 years, their secular patterns — long-term trends — followed the same general patterns, overall as well as region by region, according to the authors.

"These secular changes were significantly cointegrated, meaning that the incidence rates changed in time together, suggesting that nonperforating appendicitis and nonperforating diverticulitis could be different manifestations of the same underlying process."

Statisticians and economists have applied this kind of analysis to international finance, macroeconomics and other areas, but it's not been used to any extent in medical epidemiology, Fomby said. Two economists, Clive Granger and Robert Engle, won the 2003 Nobel Prize in Economics for their invention of the technique.

## **Appendicitis, diverticulitis may be similar diseases**

"Childhood appendicitis and adult diverticulitis seem to be similar diseases, suggesting a common underlying pathogenesis," write the

authors. Secular trends for the nonperforating and perforating forms are strikingly different, they said.

"At least for appendicitis, perforating disease may not be an inevitable outcome from delayed treatment of nonperforating disease. If appendicitis represents the same pathophysiologic process as diverticulitis, it may be amenable to antibiotic rather than surgical treatment."

Appendicitis is a painful infection in the area of the lower right abdomen that typically affects younger people, age 10 to 30, according to the National Digestive Diseases Information Clearinghouse within the National Institutes of Health. It is the No. 1 cause of emergency abdominal surgeries, according to NDDIC.

Appendicitis is caused by blockage in the appendix, a fingerlike pouch jutting from the large intestine, according to NDDIC. Among the various causes of the blockage can be feces, abdominal trauma or inflammatory bowel disease, the agency says.

Diverticulitis, which is more common among people older than 60, occurs when pouches that have developed in the lining of the gastrointestinal tract become inflamed and sometimes infected, according to NDDIC. It is often treated with antibiotics, the authors say.

## **Perforating appendicitis not a progression of nonperforating appendicitis?**

"These findings seem incompatible with the long-held view that perforating appendicitis is merely the progression of nonperforating disease where surgical intervention was delayed too long," write the authors. "If perforating appendicitis was simply a manifestation of

nonperforating appendicitis not treated in a timely manner, the secular trends should have been statistically similar, which they were not."

Both diseases have increased in incidence as cleanliness in the Western world has improved, in populations with higher socioeconomic status, and where grain-processing technologies have lowered dietary fiber content, the authors say.

In a previous study, the researchers demonstrated changes in the annual incidence rates of [appendicitis](#). The new study demonstrated changes for nonperforating diverticulitis as well.

Provided by Southern Methodist University

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