

# Molecular imaging reveals origin of acid reflux disease

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Molecular imaging has uncovered what may be to blame for acid reflux disease, a painful and potentially dangerous illness that affects a sizeable percentage of the population. A study presented at SNM's 57th Annual Meeting provides further evidence that the disease of the digestive system is brought on by a lack of tone, or motility, in the esophageal muscles that clear and keep stomach acids and other gastric contents from backing up into the esophagus.

"If the findings of this study are confirmed by similar larger studies, it may lead to the use of medications to correct the abnormal muscular movements in the esophageal wall," said Alok Pawaskar, M.B.B.S., DRM, DNB, and consultant in the nuclear medicine department at Apollo Hospitals, based in Chennai, India. "These medications, when used in combination with common antacids that reduce the acidity of the stomach's contents, could provide patients with long-term relief from reflux disease."

The medical term for this condition is gastro-esophageal reflux disease (GERD), a very common illness that affects up to 15 percent of the general population. The circular muscle that seals off and traps contents of the stomach from entering the esophagus, called the lower-esophageal sphincter, does not close properly in people with this disease. When symptoms start to arise, it is due to this valve-like muscle opening spontaneously or not being able to close, allowing gastric acid and other highly acidic contents of the stomach into the esophagus, causing inflammation and acid indigestion, or "heartburn." Further clearance of

these acidic contents from the esophagus is delayed and, over time, this leads to more serious damage to tissues—even cancer, if left untreated.

Most studies conducted to determine the cause of this disease have used more invasive and non-physiological methods of evaluating gastro-esophageal reflux disease. In this study, doctors took advantage of the ability of [molecular imaging](#) to gather information about physiological processes in the body by imaging the motility of the esophageal muscles in a functional way.

A total of 49 subjects known or suspected of having GERD were scanned while upright and again lying down to gauge ineffective esophageal motility, or poor functioning of the muscles of the esophagus and lower-esophageal sphincter. In the same sitting, a gastric reflux study was done with patients lying prone (face down). Reflux was categorized on a scale from having no sign of disease, zero, to three, having severe GERD. Of the 49 patients scanned, 11 had no sign of GERD. Out of these, five showed poor esophageal motility while lying down. Seven patients showed a mild level of GERD, all of whom showed delayed esophageal motility in supine position (lying face up). Out of 21 patients who showed moderate GERD, 19 had delayed esophageal motility in supine position while five showed delay in an erect position, as well. Lastly, of the 10 patients categorized as having severe GERD, six showed reduced motility while upright, and all 10 displayed reduced esophageal motility when lying down.

In patients who had symptoms, but showed no demonstrable GERD, almost half showed delayed esophageal motility while lying down. This suggests the presence of esophageal motility disorder—even before GERD becomes demonstrable—which points to the possibility of abnormal esophageal motility being the primary disorder leading to GERD. Overall, the study shows strong evidence for the causal relationship of ineffective esophageal motility and GERD. If confirmed

in larger trials, potential drug treatments could be developed to help improve this reduced motility and to facilitate normal esophageal function, providing patients definitive relief from gastro-esophageal reflux disease.

Provided by Society of Nuclear Medicine

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