

Obese patients less likely to develop and die from respiratory distress syndromes after surgery

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Researchers have discovered that obese adults undergoing surgery are less frequently developing respiratory insufficiency (RI) and adult respiratory distress syndrome (ARDS), and that when they do, they are less likely to have fatal outcomes. The researchers say they have several theories of how obesity protects patients from mortality associated with RI/ARDS, and pinpointing the protective mechanism could help them develop interventions to help non-obese patients avoid adverse outcomes. The finding comes from a study published online ahead of print in the *Journal of Intensive Care Medicine*.

"Although the assumption is that patients with obesity have worse perioperative and long-term outcomes, this study clearly shows that in the setting of RI/ARDS, this is not the case and obesity might actually be protective in this setting," said Stavros G. Memtsoudis, M.D., Ph.D., an [anesthesiologist](#) at Hospital for Special Surgery, who led the study.

Many factors associated with surgical procedures, including the release of inflammatory mediators, can cause [lung inflammation](#) that leads to RI/ARDS. ARDS is a life-threatening lung condition that prevents enough oxygen from getting into the blood. For their study, the researchers used a large national database sponsored by the Agency for Healthcare Research and Quality to identify patients between 1998 and 2007 who underwent common surgical procedures known to have a high risk of leading to RI/ARDS. Procedure types included open abdominal,

laparoscopic abdominal, hip and [knee arthroplasty](#), spine, cardiac, thoracic, major vascular, and surgeries of the head and neck. They identified roughly 9 million patients who underwent these procedures. Because the database includes only about 20% of patients in the United States, the national estimate would be roughly 45 million.

The researchers found that 5.48% of patients had a diagnosis of obesity, and the incidence of RI/ARDS was 1.82% among [obese patients](#) and 2.01% among non-obese patients. In patients with these conditions, in-hospital mortality was significantly lower in obese patients, 5.45% versus 18.72%. Further, the need for mechanical ventilation, which may indicate more severe cases of RI/ARDS, was lower in obese than non-obese patients (50% versus 55%). In-hospital mortality in those requiring intubation was also lower in obese patients, 11% versus 25%.

The researchers say there are several theories as to how obesity could protect against mortality in patients with RI/ARDS. First, obese people may just have more energy stores or better nutritional status to help them get through an acute illness. Second, fatty tissue may have some advantageous effect in the setting of a high inflammatory state; fatty tissue may act as a sink for the inflammatory proteins or cytokines, thus neutralizing them. "Some of the inflammatory proteins may adhere to [fatty tissue](#) and thus be removed from the circulatory system. This in turn may reduce the inflammatory process," Dr. Memtsoudis said. "There is some laboratory evidence that suggests that." A third hypothesis is that doctors are often more vigilant with obese patients, because they worry they will have more health problems, and this extra vigilance could be the cause of the "obesity paradox."

If obesity protects in the latter way, perhaps just "extending the vigilance and use of resources to monitor non-obese similarly to obese patients" while in the hospital would lower the rates of RI/ARDS, said Dr. Memtsoudis. If the second theory is true—that fatty tissues can suck up

inflammatory proteins—this knowledge could lead to the development of strategies that could improve patient outcomes. "In order to develop an intervention to prevent or treat a disease, you have to be able to understand the mechanism," Dr. Memtsoudis said. "Maybe developing an intervention that mimics the physiological process that seems to offer natural protection to obese patients, such as the binding of cytokines and other inflammatory mediators to fat, could have a protective effect."

According to the researchers, ARDS has a very high mortality rate, and in the last 20 or 30 years, there are very few interventions other than the use of improved ventilator settings that have made any impact on the outcome of this condition. They hope their study opens new avenues of research.

Provided by Hospital for Special Surgery

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