Surgical site infection rates differ by gender for certain procedures

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Men and women are at differing risks of developing surgical site infections depending on the type of operation they undergo, according to new research being presented at this year's European Congress of Clinical Microbiology & Infectious Diseases (ECCMID) in Amsterdam, Netherlands (13-16 April).

The findings, generated from national surveillance data and involving over a million operations, indicate that women may be at greater risk than men for contracting surgical site infections following coronary bypass surgery, re-vascularization of arterial occlusion, and hernia repair; whilst men fared worse after orthopaedic and trauma procedures such as hip prosthesis following arthrosis, and minimally invasive arthroscopic knee procedures, as well as colon surgery, and thyroid surgery.

This differing risk suggests that there may be underlying biological responses in the way men and women respond to specific types of surgery that need to be better understood in order to prevent painful, costly, and potentially fatal surgical site infections, the researchers say.

Surgical site infections are among the most common healthcare-associated infections worldwide. Every year in the USA an estimated 300,000 patients develop surgical site infections, which are responsible for over 10,000 deaths, and cost the health care system billions of dollars. In NHS hospitals in England, surgery results in over 100,000 surgical site infections each year. An estimated 40-60% of these infections are preventable.

Previous research has generally found men to be at higher risk of these postoperative complications. However, when focusing on specific procedures this does not always appear to be the case.

To explore this further, Dr. Seven Aghdassi from Charité - Universitätsmedizin Berlin in Germany and colleagues analysed data from the German national hospital-acquired infection surveillance system to examine for which procedures gender may be a risk factor for surgical site infections, and what factors might explain these differences.

All surgical procedures conducted in German hospitals participating in the German national hospital-acquired infection surveillance system between 2008 and 2017 were included in the analyses. Procedures solely executed for one sex (e.g., mastectomy) and procedures with fewer than 20,000 operations were excluded.

In total, 16 procedure types with 1,266,782 individual operations and 18,824 surgical site infections were included in the analysis.

Researchers took into account and adjusted for other known risk factors for surgical site infections including the patient's age, physical state before surgery, wound contamination class, duration of surgery, and season.

Results showed that male patients undergoing orthopaedic and abdominal surgery were significantly more likely to develop a surgical site infection compared to female patients.

In contrast, surgical site infections-rates were substantially higher in women following heart and vascular surgery and general surgery (ie, hernia repair and thyroid surgery).

However, within these broad surgical groups individual procedures revealed mixed results (see figure 1). For instance, men were twice as likely to develop a surgical site infection following arthroscopic procedures than women, whereas the odds of acquiring a surgical site infection in patients undergoing hip replacement due to fracture did not differ significantly.

Conversely, women had a roughly doubled risk of contracting surgical site infections following coronary bypass surgery, and hernia repair than their male counterparts.

"A possible reason for the gender differences in surgical site infection rates for specific procedures may be due to differences in comorbidities, microbiome composition, and body constitution.", explains Dr. Aghdassi.

Although the research does not establish a cause-and-effect relationship between gender and surgical site infections, the researchers say that the association between them is strong and should be investigated further.

"Our analysis considered a limited number of parameters, which were not sufficient to explain all the observed differences. By understanding the different factors that put men and women at risk for infections, we will hopefully be able to develop new prevention and surveillance strategies to improve infection rates and outcomes", says Dr. Aghdassi.

The authors note several limitations including that the German national hospital-acquired infection surveillance system only collected a limited set of patient-based variables, therefore additional patient-based information, which could help interpret the results, is lacking. They also note that the data was collected from a large number of hospitals with heterogeneous data collection teams.

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