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New research suggests 50 million patients suffer complications after surgery each year

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Credit: Queen Mary, University of London

Three hundred and ten million patients undergo surgery worldwide each year, but while global initiatives are increasing access to surgical treatment, little data has been compiled about complication rates after surgery.

This research by the International Surgical Outcomes Study Group, led by Queen Mary University of London's Professor Rupert Pearse and published in the *British Journal of Anaesthesia*, provides the first set of comparative statistics at an international level.

It indicates that poor patient outcomes are common after planned (elective) in-patient surgery, and that mortality rates following complications are at broadly similar levels in the poorest and wealthiest countries although patient populations may differ.

Lead author, Professor Pearse, said: "This survey is the most extensive of its kind ever performed. Whilst most patients having planned surgery did not experience any problems, a large number of patients did develop complications and many of them did not survive."

Method

Four hundred and seventy four hospitals in 27 high, middle and low income countries participated over a seven day period and data from 44,814 patients following routine, non-emergency surgery were analysed. The study compared different types of surgery with the frequency of adverse outcomes, and quantified the range of complications occurring and their severity.

Primary findings

The survey found that one in six patients (16.8 per cent) developed complications in hospital, and that one in 35 of those patients (2.8 per cent) subsequently died without leaving hospital. The figures based on a seven day sample period suggest that over a 12 month period, 50 million patients suffer complications following surgery in hospitals, and that over 1.5 million die from those complications.

Most common complications

The most common complication following surgery was infection, and particularly superficial site infection, caused for example by bacteria on the skin around a surgical wound. The study found that 2.9 per cent of patients suffered from such infections, which equates to nine million patients worldwide, every year. Of those patients, 1.3 per cent died from the infection (117,000 patients annually).

The total number of patients affected by all types of infectious complications was nine per cent which would be 28 million patients annually.

Cardiovascular complications were the other major source of adverse outcomes with conditions including arrhythmias and heart attacks. Cardiovascular complications affected 4.5 per cent of all patients.

Surgical procedures and their association with complications

The survey assessed different categories of surgery and their association with complications. Researchers found the type of surgery which carried the greatest risk of complications worldwide to be upper gastrointestinal - that is surgery involving the oesophagus, stomach and small bowel. The surgery carrying the greatest risk of mortality following a complication was cardiac procedures. By comparison, the procedures carrying the least risk of complications related to orthopaedics, and breast procedures.

Comparison between low/middle and high income countries

The survey highlights important differences in hospital care and patient characteristics when comparing country groups.

The survey found that fewer patients suffered complications following surgery in low and middle income countries - 11 per cent of patients compared to 19 per cent in high income countries. This may be because surgery is offered to patients in high income countries who are older, more frail, suffering from long-term diseases, such as diabetes or heart failure, and who are therefore at greater risk.

Hospitals in high income countries had better critical care capacity and patients were more likely to be admitted to critical care following their surgery, either as part of their planned treatment, or after developing complications.

However, mortality rates among those with complications were at broadly similar levels across the different country groups (2.6 per cent of patients in high income countries vs 3.3 per cent in low/middle income countries). These statistics beg the question of whether the right patients are being admitted to critical care? And if more lives could be saved if the criteria for critical care were reassessed.

Conclusion

The researchers say too many patients are suffering adverse outcomes and too many are dying due to complications. Better planned care around the time of surgery might prevent many of these cases. They want to see more robust auditing of all outcomes following surgery. In addition they believes there needs to be a fresh focus on care aimed at reducing post-operative complications which can not only severely impact of patients' lives, but are a huge burden on the world's health services.

Professor Rupert Pearse is calling hospitals around the world to work to

reduce the incidence of preventable complications. He said: "There is still a great deal of work to be done to improve patient care around the time of surgery. Initiatives such as that led by the Royal College of Anaesthetists Perioperative Medicine programme provide excellent examples of what can be done to re-solve these problems."

British Journal of Anaesthesia Editor-in-Chief Professor Ravi Majahan said: "These findings should serve as a wake-up call. We need to do more to prevent post surgery complications - and particularly complications such as infection which are in many cases preventable, but as this research suggests are claiming the lives of three quarters of a million people worldwide, every year."

Countries included in study:

- High income countries: Australia, Austria, Belgium, Canada, Denmark, France, Germany, Greece, Hong Kong, Italy, The Netherlands, New Zealand, Portugal, Russia, Spain, Sweden, Switzerland, UK, and USA
- Low and middle income countries: Brazil, China, Indonesia, Malaysia, Nigeria, South Africa, Romania, Uganda

More information: Global patient outcomes after elective surgery: prospective cohort study in 27 low-, middle- and high-income countries, *British Journal of Anaesthesia* (2016). DOI: 10.1093/bja/aew316

Provided by Queen Mary, University of London

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