Supplemental oxygen halves infection risk

Administering supplemental oxygen to patients during and after surgery cuts the risk of surgical site infections (SSIs) in half. These are the findings of a new study by Belda et al published in the Oct 26 Journal of the American Medical Association.

SSIs increase length of stay by an average of 1 week, and substantially increase costs. The primary defense against SSI pathogens is oxidative killing by neutrophils. Because infection risk depends on tissue oxygen partial pressure, interventions that increase tissue oxygen may reduce infection risk.

Belda and colleagues randomized 300 patients having colorectal surgery in 14 hospitals in Spain to either 30% (143 patients) or 80% (148 patients) fraction of inspired oxygen (FIO\textsubscript{2}) intraoperatively and for 6 hours postoperatively.

Surgical site infection occurred in 35 patients (24.4%) administered 30% FIO\textsubscript{2} and in 22 patients (14.9%) administered 80% FIO\textsubscript{2}. The risk of SSI was 39% lower in the 80% FIO\textsubscript{2} group vs the 30% FIO\textsubscript{2} group. After controlling for multiple contributing factors, the reduction in surgical site infection (SSI) risk associated with 80% FIO\textsubscript{2} was nearly 54%.

These findings were similar to the twofold reduction reported by Greif et al in 500 patients and the study by Hopf et al, showing that infection risk is inversely related to tissue oxygenation.

In contrast, a recent study by Pryor et al with 160 patients reported that supplemental oxygen increases the risk of infection.

Belda and colleagues considered why the results of Pryor et al differ so markedly from theirs and other studies.

They found that the Pryor study did not specify the baseline infection rate they used, making it impossible to confirm their estimate that 300 patients would be required to detect a 40% reduction in infection rate. The study, which appears to have been underpowered, was then stopped after only 160 patients were randomized. A second limitation was that the treatment groups in the Pryor study were not homogeneous, and they failed to control many variables believed to influence infection risk.

References


