

Effect of perioperative supplemental oxygen on two-year mortality in high-risk patients undergoing noncardiac surgery

Alexander Taschner, MS¹; Nikolas Adamowitsch, MS¹; Oliver Zotti, MS¹; Markus von Sonnenburg, MD¹; Horvath, Katharina, MD¹; Edith Fleischman, MD¹; Barbara Kabon, MD¹; Christian Reiterer MD¹

¹ Department of Anaesthesia, General Intensive Care Medicine and Pain Medicine, Medical University of Vienna, Austria

Background:

The effect of perioperative supplemental oxygen on long-term mortality has been extensively investigated. Although a follow-up study of the most recent and largest trial and a further follow-up study in patients undergoing colorectal surgery did not show a significant difference in mortality,¹ the follow-up study of the PROXI trial, however, has shown that patients receiving supplemental oxygen are more likely to die within 5 years.^{2,3}

Interestingly, the effect of supplemental oxygen on long-term mortality in elderly patients with many cardiovascular comorbidities is not entirely cleared. We therefore investigated in this follow-up study the effect of supplemental oxygen administration on two-year mortality in cardiac-risk patients undergoing major abdominal surgery.

Methods:

Mortality data was obtained for 258 patients at-risk for cardiovascular complications, who participated in a prospective, randomized, clinical trial and underwent major abdominal surgery. In the original study, we randomly assigned patients to receive 80% versus 30% oxygen throughout surgery and for the first two postoperative hours. Patients were enrolled between December 2017 and December 2019. A Cox proportional hazard ratio was performed to determine if there were differences in the survival distribution for both study groups in August 2021. Kaplan-Meier survival curves were created for both study groups.

Results:

128 patients received 80% oxygen and 130 patients received 30% oxygen throughout surgery and for the first two postoperative hours. Baseline characteristics were similar between both groups. Overall, 32 patients in the 80% oxygen group and 29 patients in the 30% oxygen group died within the follow-up period. There was no significant difference in two-year survival distribution between both study groups (hazard ratio 1.15; 95% CI 0.70-1.90; $p = 0.59$) (Figure 1).

Conclusions:

We did not observe a significant effect of perioperative supplemental oxygen on long-term mortality in cardiac risk patients undergoing major abdominal surgery. Based on previous trials and on our results, it seems very likely that supplemental oxygen has no significant effect on long-term mortality even in elderly patients with many comorbidities.

References:

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3. Podolyak A, Sessler DI, Reiterer C, et al. Perioperative supplemental oxygen does not worsen long-term mortality of colorectal surgery patients. *Anesth Analg*. 2016;122(6):1907-1911. doi:10.1213/ANE.0000000000001316

Figure 1:

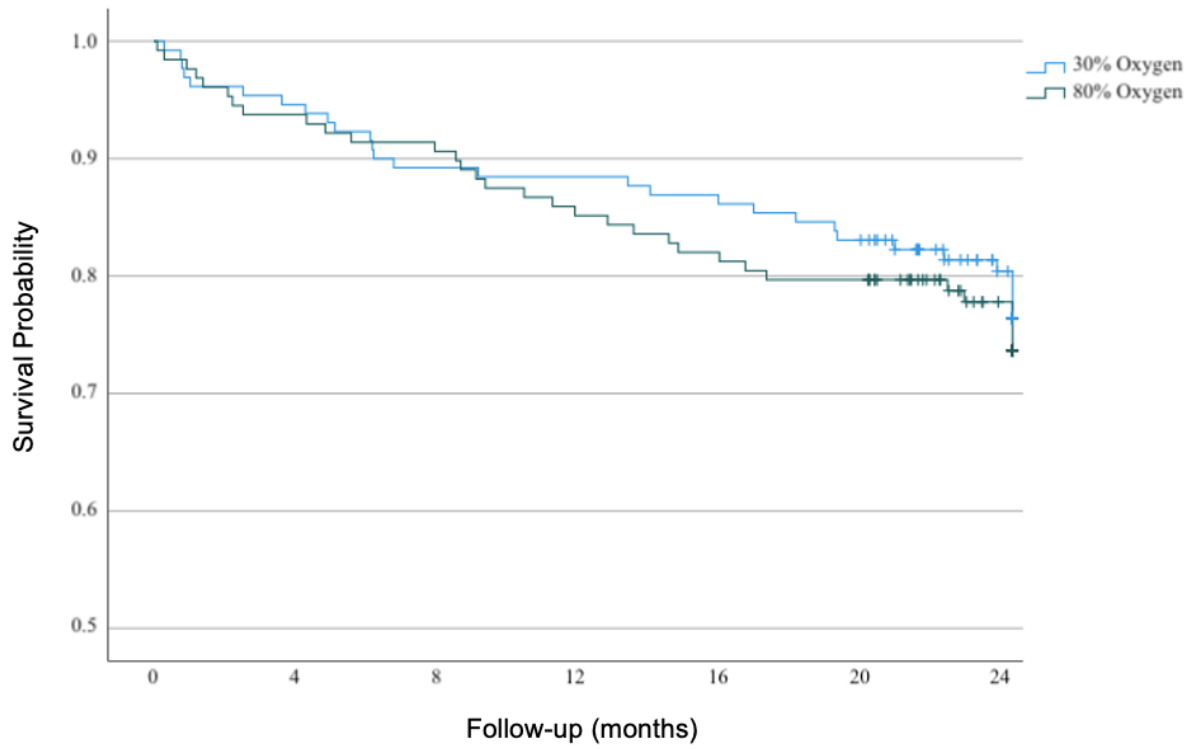


Figure 1. Two-year Kaplan Meier survival estimate curves comparing randomized 80% oxygen (green) and 30% oxygen (blue) groups. Crosses represent end of follow-up for study patients.