

Encouraging smoking cessation means fewer postoperative complications

Møller AM, Villebro N, Pedersen T, Tønnesen H. Effect of preoperative smoking intervention on postoperative complications: a randomised clinical trial. *Lancet* 2002;359:114-7.

Background: Cigarette smoking is associated with an increased risk of postoperative wound and pulmonary and cardiovascular complications. Previous work has indicated that the incidence of postoperative complications is reduced among patients who are able to quit smoking at least 8 weeks before surgery.¹

Question: Does an active intervention program to facilitate smoking cessation preoperatively lead to a reduced frequency of postoperative complications?

Methods: This randomized controlled trial was conducted among patients scheduled to undergo elective hip or knee arthroplasty at 3 university hospitals in Copenhagen. Eligibility was defined by "daily cigarette smoking." Subjects randomly assigned to the intervention arm were offered weekly meetings with a study nurse that began 6 to 8 weeks before surgery. The study nurse helped design an individualized nicotine-replacement program and counselled patients about side effects and withdrawal symptoms and about ways to minimize weight gain as they reduced tobacco consumption. Subjects in the control arm received standard preoperative care, with no active intervention program to promote smoking cessation.

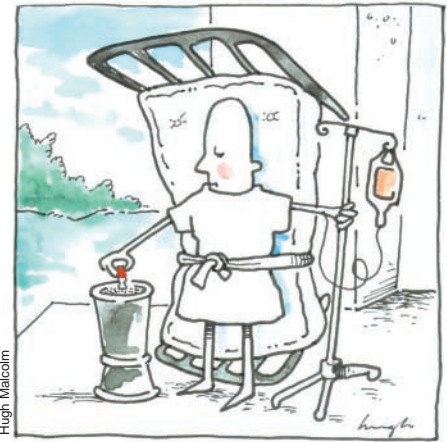
The primary outcome measure was postoperative complications, defined as death or postoperative morbidity requiring treatment within 4 weeks after surgery. Analysis was by the intention-to-treat principle.

Results: Although 120 patients were enrolled in the study, 4 in the intervention group and 8 in the control group were excluded because their surgery was cancelled or postponed.

Among the remaining 108 patients whose surgery proceeded as scheduled, there were no significant differences between the intervention and control groups in age, sex, body mass index, preoperative estimate of surgical risk (according to the American Society of Anesthesiology classification scheme), pulmonary or cardiovascular comorbidity, or smoking habits. The median number of cigarettes smoked per day was 15 in each group, with a cumulative exposure of 35 pack-years in the intervention group and 37 pack-years in the control group. The proportion of patients undergoing hip or knee arthroplasty was comparable in the intervention and control groups, as was the proportion who received general anesthesia. The median duration of surgery was 90 minutes in each group.

The smoking cessation intervention was highly successful: 36 patients stopped smoking altogether, and 14 were able to reduce their smoking by at least 50%. In the control group, only 4 patients stopped smoking. The overall postoperative complication rate was 18% in the intervention group and 52% in the control group ($p = 0.0003$). Most of the benefit was observed in the rate of postoperative wound complications (hematoma, infection, subfascial involvement), with respective rates of 5% and 31% in the intervention and control groups ($p = 0.001$). There was also a trend toward lower rates of cardiovascular complications (acute myocardial infarction or congestive heart failure; 0% v. 10%, $p = 0.08$) and of secondary surgery (4% v. 15%, $p = 0.07$) in the intervention group. The rate of pulmonary complications was low (2%) in each group. There were no deaths.

Commentary: This study shows an impressive reduction in the rate of postoperative wound complications among patients who received an active intervention program to facilitate smoking cessation or reduction in the 6 to 8 weeks before surgery. Because ortho-



pedic procedures are associated with a relatively low risk of pulmonary complications, the study was unable to demonstrate an impact on postoperative pulmonary morbidity.

Practice implications: An active intervention program to achieve reduction or cessation of smoking 6 to 8 weeks preoperatively has a high success rate and is effective in reducing the rate of postoperative wound infections among patients undergoing elective hip and knee arthroplasty. Further research is required to determine whether a similar approach, applied to patients undergoing procedures associated with a higher risk of pulmonary complications (e.g., upper abdominal or thoracic surgery), will yield comparable reductions in postoperative pulmonary morbidity.

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The In the Literature series is edited by Dr. Donald Farquhar, head of the Division of Internal Medicine, Queen's University, Kingston, Ont.

Reference

1. Warner MA, Offord KP, Warner ME, Lennon RE, Conover A, Jansson-Schumacher U. Role of preoperative smoking cessation and other factors in postoperative pulmonary complications: a blinded prospective study of coronary artery bypass patients. *Mayo Clin Proc* 1989;64:609-16.