Should smokers be referred to a smoking-cessation clinic before undergoing elective surgery?

Trial: Møller AM, Villebro N, Pedersen T, Tønnesen H. Effect of preoperative smoking intervention on postoperative complications: a randomised clinical trial. Lancet *2002; 359: 114-117.*

Question

Can smokers be assisted in giving up smoking before elective surgery and does this reduce complications?

Trial details

Design: Randomised controlled trial of preoperative smoking intervention in patients undergoing hip and knee replacement surgery.

Setting: Three university-affiliated hospitals in Denmark.

Patients: 62 women and 46 men aged 30–85 years, scheduled for surgery in 6–8 weeks. A further 12 patients were recruited to the trial, but were not included in the analysis because their operations had been postponed or cancelled. Median (range) of smoking exposure was 15 (3–30) cigarettes per day.

Interventions: Weekly counselling with a project nurse and the option of nicotine replacement therapy. The first meeting included a questionnaire to measure nicotine dependence and a personalised nicotine substitution schedule was devised. The patients were strongly encouraged to stop smoking completely, or to at least reduce their tobacco consumption by at least 50%. At all subsequent meetings, tobacco consumption was recorded and patients were advised on how to manage immediate withdrawal symptoms and how to keep weight gain to a minimum.

Main outcome measures: Frequency of postoperative complications.

Main results: The overall complication rate was 18% in the intervention group and 52% in controls ($P = 0.0003$). These included wound-related complications (5% v 31%; $P = 0.001$), cardiovascular complications (0 v 10%; $P = 0.08$), and secondary surgery (4% v 15%; $P = 0.07$). The median length of stay was 11 days (range, 7–55 days) in the intervention group and 13 days (range, 8–65 days) in the control group ($P = 0.41$). Overall relative risk reduction was 65% and the number needed to treat (NNT) to avoid any complication was 3 (95% CI, 2–6). In addition, the NNT to avoid wound infection was 4 and the NNT to avoid secondary surgery was 9.

Conclusion: A smoking intervention program before surgery can help smokers quit and is associated with a reduction in postoperative complications.

Commentary

Rationale for the trial

Smoking increases the risk of complications in patients undergoing surgery, and it is usual practice to recommend stopping smoking for at least 6 weeks beforehand.[1-3] About 25% of all patients who undergo surgery are current smokers. Studies of the adverse effects of smoking in surgical patients have mostly focused on cardiopulmonary risk reduction, but recent studies identify an association with wound infection.[4,5]

Trial methods

The trial was very well conducted and interpreted, but some aspects deserve closer scrutiny. The intervention period was 6–8 weeks before and 10 days after the operation. In Australia, many patients undergoing elective surgery have their operations booked within a few weeks, and so may not have an opportunity to participate in such a program. A shorter intervention program may not be effective, which raises the question of whether surgery ought to be delayed to allow such a program to be instituted. The intervention program included many components: counselling with a project nurse, additional information and support for patients, smoking cessation or reduction, and use of nicotine replacement therapy. Each could have contributed to the reduction in complications. Nicotine substitution products were provided without charge. If smokers were asked to pay, they may be less willing to participate. In this study, 46 patients (of 166) refused to participate. Patients who refused may have been heavier smokers, and could have been more at risk of complications, despite a short-term change in smoking behaviour. This could affect the generalisability of the results.

The study population was restricted to orthopaedic patients. It is yet to be determined if this intervention can be effective in patients undergoing procedures associated with a higher risk of pulmonary complications, such as abdominal or thoracic surgery.

Patients in the control group received standard care, with little or no information about the risk of tobacco smoking or smoking cessation counselling. Some readers may believe that this does not represent contemporary Australian practice, but most smokers do not quit in any case.[4]

Twelve patients were excluded from the analysis because of cancellation or postponement of surgery. An additional analysis of the entire intention-to-treat population could be expected to reduce the estimated risk reduction and increase the number needed to treat (NNT).

New information

Smoking cessation or at least 50% smoking reduction occurred far more frequently in the smoking intervention group — 36 patients, compared with four in the control group, stopped smoking. This study found an impressive reduction in the rate of postoperative wound complications among patients who underwent the smoking intervention program.

Implications for clinical practice

This trial identified a simple and effective intervention that reduces wound complications after orthopaedic surgery. The study was unable to show an impact on postoperative pulmonary morbidity, but this may have been because orthopaedic procedures are associated with a relatively low risk of pulmonary complications. Other information suggests that extrapolating these findings to patients undergoing other types of surgery might be beneficial.[1-6]

The extent of the risk reduction attributable to smoking cessation is consistent with Australian data for smokers having other types of surgery on a day-stay basis.[4] This effect is substantial, and highlights a need to identify smoking status before elective surgery to enable an effective intervention to be offered. The known risks of smoking and the benefits of stopping smoking should be made clear to patients.

Are doctors doing enough to stop their patients smoking? There are reports of successful smoking intervention programs targeting hospital patients.[7] There has been considerable success in reducing coronary heart disease risk factor levels and improving general health status, including reduced anxiety and depression, in patients awaiting coronary artery bypass graft surgery.[7] Nicotine replacement and bupropion therapy can be useful adjuncts.[8]

Community smoking intervention programs are cost-effective, especially when absenteeism, premature disability and death are taken into consideration.[9] Additional cost savings could be expected if such programs were used for patients requiring elective surgery, in view of the marked additional costs of increased need for intensive care and treating complications.

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Competing interests

None identified.

References

1. Pearce AC, Jones RM. Smoking and anesthesia: preoperative abstinence and perioperative morbidity. *Anesthesiology* 1984; 61: 576-584.
2. Warner MA, Diverte MB, Tinker JH. Preoperative cessation of smoking and pulmonary complications in coronary artery bypass patients. *Anesthesiology* 1984; 60: 380-383.
3. Bluman LG, Mosca L, Newman N, Simon DG. Preoperative smoking habits and postoperative pulmonary complications. *Chest* 1998; 113: 883-889.
4. Myles PS, Iacono G, Hunt JO, et al. The risk of respiratory complications and wound infection in patients undergoing ambulatory surgery: smokers versus nonsmokers. *Anesthesiology* 2002; 97: 842-847.
5. Kurz A, Sessler DI, Lenhardt R. Perioperative normothermia to reduce the incidence of surgical-wound infection and shorten hospitalization. *N Engl J Med* 1996; 334: 1209-1215.
6. Skolnick ET, Vomvolakis MA, Buck KA, et al. Exposure to environmental tobacco smoke and the risk of adverse respiratory events in children receiving general anesthesia. *Anesthesiology* 1998; 88: 1144-1153.
7. McHugh F, Lindsay GM, Hanlon P, et al. Nurse led shared care for patients on the waiting list for coronary artery bypass surgery: a randomised controlled trial. *Heart* 2001; 86: 317-323.
8. Silagy C, Lancaster T, Stead L, et al. Nicotine replacement therapy for smoking cessation (Cochrane Methodology Review). In: The Cochrane Library, Issue 4, 2003. Chichester, UK: John Wiley & Sons, Ltd.
9. Elixhauser A. The costs of smoking and the cost effectiveness of smoking-cessation programs. *J Public Health Policy* 1990; 11: 218-237.

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