

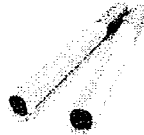
Anesthesia Implications of Smoking...

An Evidence Based Approach

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Outline

- ❏ Introduction
- ❏ Relationship between smoking and perioperative complications
- ❏ Smoking cessation and perioperative complications
- ❏ Summary
- ❏ Questions



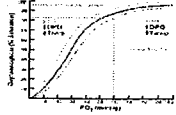
Introduction

- ❏ Smoking is the single most important avoidable cause of death in the US
 - ❏ 25% of adult population smoke
- ❏ Long term effects include a variety of cardiovascular diseases, pulmonary diseases, and cancers




Introduction

- ❏ Short-term effects
 - ❏ Nicotine: dose related increase in HR and BP, increases coronary artery resistance in diseased vessels
 - ❏ Carbon monoxide: Combines with Hgb to form COHgb, which shifts O2-Hgb curve to the left
- ❏ Long-term effects
 - ❏ Leading cause of atherosclerotic disease
 - ❏ Major risk factor for coronary artery disease
 - ❏ Leading cause of COPD
- ❏ Other effects
 - ❏ Increase oral secretions
 - ❏ Greater upper airway sensitivity



Smoking and Perioperative Complications

- ❏ **Evidence:** Pulmonary Complications
 - ❏ Morton (1944) prospective study of 1257 Pts undergoing abdominal surgeries
 - ❏ Pulm complications 60% for smokers vs 10% non-smokers
 - ❏ Mitchell, et al (1998) 40 Pts undergoing non-thoracic surgeries
 - ❏ Higher incidence of sputum production vs non-smokers
 - ❏ Dillworth, et al (1992) Prospective study of 127 Pts undergoing abdominal surgeries
 - ❏ Post-op pulm infection:
 - ❏ Smokers with Bronchitis 83%
 - ❏ Smokers 21%
 - ❏ Non-smokers 7%



Smoking and Perioperative Complications

- ❏ **Evidence:** Airway complications
 - ❏ Schwilk, et al (1997) Reviewed the occurrence of perioperative airway and respiratory events (reintubation, laryngo/bronchospasm, hypoventilation) in 26,961 anesthetics
 - ❏ Smokers 5.5% vs non-smokers 3.1%
 - ❏ Higher incidence in <35 yo and chronic bronchitis
 - ❏ Forrest, et al (1992) Identified smoking as an independent predictor of bronchospasm in 17,201 anesthetics

Smoking and Perioperative Complications

- ❏ **Evidence:** Cardiovascular complications
 - ❏ Choudhri, et al (2000) Analyzed 19,224 records of Pts who underwent CABG surgery, and identified smoking as an independent predictor of stroke
 - ❏ Martin, et al (1999) performed a regression analysis on Pts who had abdominal aortic surgery, smoking was found to be an independent predictor of postoperative complications, renal deterioration was the most common

Smoking and Perioperative Complications

- ❏ **Evidence:** Surgical complications
 - ❏ Increase nonunion rate after spinal fusion (Glassman et al, 2000)
 - ❏ Increase need for re-operation after ankle arthrodesis (Cobb et al, 1994)
 - ❏ Increase infection rate after amputation (Lind et al, 1991)
 - ❏ Increase resource consumption after joint replacement (Loveira, et al 1999)
 - ❏ Higher incidence of anastomotic leaks in colorectal surgery (Sorensen et al, 1999)

Neuromuscular Blockade

- ❏ Salihoglu (2007) 20 smokers/20 nonsmokers, general anesthesia using rocuronium
- ❏ Continuous stimuli by nicotine leads to "down regulation" of nicotinic receptors
 - ❏ Lower number of receptors can be blocked more rapidly in smokers. (61 sec vs 66 sec onset)
- ❏ Induced liver enzymes in smokers leads to:
 - ❏ Shorter clinical effect
 - ❏ Increased doses required to maintain blockade

Smoking Cessation and Perioperative Complications

Respiratory

- ❏ Warner (1984/1989)- retrospective analysis of 500/200 CABG patients. (Hx of smoking: 486/150)
- ❏ Confirmed by two studies in Brooks-Brunn (1997) and Bluman (1998)

| | |
|-------------|------|
| Smokers | 48% |
| Quit 2 wks | >48% |
| Quit 4 wks | >48% |
| Quit 6wks | <48% |
| Quit 8wks | 17% |
| Non-smokers | 11% |

Smoking Cessation and Perioperative Complications

Respiratory

- ❏ Nakagawa (2001)
 - ❏ Nonsmokers 24%
 - ❏ Smokers 43%
 - ❏ Quit 2-4wks 54%
 - ❏ Quit >4wks 35%
 - ❏ Equivalent complications of nonsmokers and those quit for 8 weeks



Smoking Cessation and Perioperative Complications

Respiratory: Conclusion

- ❏ Patients who cease smoking prior to surgery can decrease the risk of pulmonary complications but only if the period of abstinence is > 8 weeks
- ❏ Risk does not begin to fall until after 4 weeks of abstinence, until then it increases

Smoking Cessation and Perioperative Complications

Wound Healing

Kuri (2005) 188 head/neck surgical patients

- ❑ Impaired wound healing
 - ❑ Nonsmokers 47%
 - ❑ "Early quitters" 59%
 - ❑ "Intermediate quitters" 55%
 - ❑ "Late quitters" 68%
 - ❑ Smokers 85%

Smoking Cessation and Perioperative Complications

Wound Healing

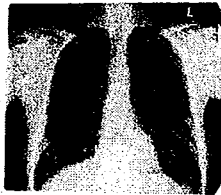
- ❑ Sorenson (2003)
 - ❑ Randomized to
 - ❑ Non-smokers
 - ❑ Smokers
 - ❑ Abstinence with nicotine patch or placebo
 - ❑ Smokers had greater rates of infection than abstinent smokers and nonsmokers in wounds made 4 weeks after randomization



Smoking Cessation and Perioperative Complications

Wound Healing: Conclusion

- ❑ Shorter period of abstinence is required to decrease impaired wound healing complications (than decrease respiratory complications)



Smoking Cessation and Perioperative Complications

Cardiac Complications

- ❑ Woehlick (1999)
- ❑ Carbon monoxide in expired gas and hemodynamic data
- ❑ Increased CO indicates recent smoking
- ❑ Rate pressure product and CO levels were significant predictors of ST depression
 - ❑ Findings: Patients <age 65 without symptoms of ischemic heart disease who smoked shortly before surgery had more episodes of ST depression than nonsmokers, prior smokers, chronic smokers who did not smoke before surgery, females > males.

Summary

- ❑ Smokers have a higher rate of postoperative complications than nonsmokers
- ❑ Preoperative smoking cessation decreases the postoperative complication rate
- ❑ The longer the preoperative cessation, the better

Questions??



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