

Why You Should Stop Smoking Before Going For Surgery?

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Citation

A Elshimy. *Why You Should Stop Smoking Before Going For Surgery?*. The Internet Journal of Health. 2005 Volume 5 Number 1.

Abstract

Modern anaesthetics are extremely safe. New drugs, modern monitors and well-trained anesthetists make anaesthesia safer all the time. For healthy people anaesthesia is so safe that it is difficult to measure the degree of risk any more. People with heart, lung or other diseases, obviously, have an increased risk.

Smoking whether active or passive puts the patient at increased risk whenever he undergoes surgery and anaesthesia with higher incidence of perioperative complications and unplanned ICU admission. In the short term it causes physiological changes in the body, which is attributed to both nicotine and carbon monoxide. While in the long term it does so by doubling or even tripling the incidence of major heart and lung diseases.

In this article I am going to stress on facts about smoking and anaesthesia concluding that stop smoking even for short term preoperatively can reduce the risks and the incidence of perioperative complications.

INTRODUCTION

Putting a patient to sleep before surgery is getting safer all the time. Thanks to

- New drugs used for induction and maintenance of anaesthesia
- Modern monitors which can pick up any problem at an early stage
- Finally and most important the well trained anaesthetists who are not only give anaesthesia but also evaluate the patient thoroughly before surgery and continue caring of him postoperatively.

These factors make anesthesia so safe for patients who are not known to have medical problems

Since 1960s anesthetists use the American Society of Anaesthetists (ASA) classification as a clinical description of disability related to a patient's general health. This five point scale correlates to some degree with the risk of perioperative complications. The scale starts from ASA I which denotes a normal healthy patient to ASA V who is a moribund or a very sick one

Smoking whether active or passive is a well known risk

factor for the general health. This in turn has had impact on the safety of anesthesia and the incidence of complications. There are more than 4000 chemicals in cigarette smoke, including 43 known cancer causing compounds and 400 other toxins. Smoking accounts for more than 30% of all deaths from cancer, almost 90% of deaths from lung cancer. A strong link has been discovered between smoking and cancers of the pancreas, kidney and urinary bladder. Another terrible statistic about smoking and cancer is that the overall rates of death from cancer are twice as high among smokers as among non smokers (!) with heavy smokers having rates that are four times greater than those of nonsmokers.

FACTS ABOUT SMOKING AND ANAESTHESIA

Smoking is also implicated in many major heart and lung (non cancer) diseases

- Coronary or ischemic heart diseases. Smoking is responsible for about a quarter of heart attack deaths
- Increased level of LDL or bad cholesterol with its known effect in atherosclerosis and increased risk of stroke, peripheral vascular diseases
- Increased hematocrit or red blood cell mass resulting in increased blood viscosity with high

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risk of postoperative deep venous thrombosis

- Hypertension, which is difficult to control, compared to non-smokers
- Pulmonary morbidity

As mucus clearance from lungs is accomplished by cilia, which are hair like projections lining inside of, the lungs constantly move dirt, bacteria up into the throat. Smoking paralyzes cilia so no more clearance and lungs become clogged with thick secretions of mucus, bacteria and dead cells with infection is more likely to occur. Small airway narrowing, chronic bronchitis, finally as more lung tissue is destroyed emphysema occurs with loss of gas exchange function

As result of the above cardio pulmonary changes the patient is ranked by the anesthetist as ASA I, II, III or even IV with higher risk and higher incidence of postoperative complications

Now it is not uncommon to see a young smoker who has no medical problems with normal cardio pulmonary functions, and who usually continues to smoke up until the day of surgery as many smokers usually do.

Although he is ranked as ASA I by definition surgery and anesthesia for him is not as safe as if he were non smoker owing to the following

1. Inhaling nicotine causes release of adrenaline, which is known to increase heart rate; blood pressure and this in turn will increase myocardial oxygen demand
2. Carbon monoxide in the cigarette smoke binds to hemoglobin replacing oxygen with carboxyhemoglobin up to 7-15% this will reduce oxygen availability to tissues. Thus the combined effect of both nicotine and carbon monoxide will result in myocardial ischemia due to increased demand and reduced oxygen availability. In one study done on patients with normal coronaries ST depression seen in, the electrocardiogram which is a sign of myocardial ischemia associated with increased rate-pressure product (heart rate x blood pressure) under anaesthesia were correlating well with level of carboxyhemoglobin in their blood (2)
3. Smoking induces liver enzymes that metabolize

drugs used for induction and maintenance of anesthesia making action and duration of these drugs less predictable

4. Emergence from anaesthesia is usually not smooth, breath holding, laryngeal spasm, bronchospasm, hypoventilation and hypoxia can occur
5. postoperative pulmonary complications including atelectasis, chest infection or pneumonia is common. The incidence of these complications is increased 5 folds in smokers compared to non-smokers (3, 4)
6. Wound infection a study comparing risk of respiratory complications and wound infection in patients undergoing ambulatory surgery in smokers versus non smokers concluded an increased risk in smokers (5)

MISCONCEPTIONS ABOUT SMOKING

Passive or second hand smoking is not as bad as active smoking: this is not true

1. Second hand smoke is unfiltered so that carcinogen level can be up to 100 times higher than those inhaled directly through cigarette.
2. 30 minutes Exposure to smoke is enough to reduce coronary blood flow while long term exposure increase the chance to have lung and heart disease by 25%
3. In children exposed to parents smoke are at higher risk of perioperative respiratory complications. In one study where 602 children who are exposed to environmental tobacco smoke undergoing surgery under anaesthesia. Children with high urine cotinine (the metabolite of nicotine) have higher rate of perioperative respiratory complications as compared to those with low urine cotinine. (6) also there is 10 fold increase in the incidence of laryngeal spasm on emergence from anaesthesia (7)

Narghile or water pipe smoking is less dangerous than cigarette smoking: also not true

In fact all studies prove that water pipe is at least as toxic as cigarette

1. The nicotine content has been reported to be 2-4% compared to 1-3% in cigarette (8)
2. Carbon monoxide concentration of 0.34-1.4% compared to 0.41% in cigarette and after smoking for 10-40 minutes the mean carboxyhemoglobin concentration was 10.1% compared to 6.5% after cigarette smoking (9, 10)

To summarize water pipe smoking has the same hazards of cigarette smoking plus the way of smoking using same pipe makes it a mean of spreading infection as pulmonary aspergillosis, tuberculosis, and respiratory viruses.^(11, 12)

Cessation of smoking- prior to surgery has therefore been advocated for decades, but for how long? In other words what is the recommended smoke-free interval before surgery?

This is a controversial issue. while some adverse effects can improve following 24 hours of abstinence like effects of carboxyhemoglobin and nicotine effect on heart rate and blood pressure

Others like increased blood viscosity and risk of postoperative deep venous thrombosis takes few days to reverse ^(13,14,15)

- The effect on the small airways and sputum production declines over a 6 weeks period abstinence while 6 months of preoperative abstinence will reduce the incidence of postoperative chest infection to that of non-smokers after cardiac surgery (16).

CONCLUSION

Smoking whether active or passive is dangerous in the short and long term. The smoker has an increased risk whenever he undergoes surgery even if he were otherwise normal.

A smoke free interval of 2-6 months is recommended to decrease incidence of postoperative pulmonary complications, and if not feasible even 24 hours cessation by reducing carboxyhemoglobin level can improve oxygen availability to tissues and hence decrease the perioperative

cardiac morbidity.

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