ORIGINAL ARTICLE

Screening for Nicotine Dependence and Smoking Behaviour in General Surgical Patients

RAHEEL AZIZ[1], BUSHRA MUBARIKA BUTT[2], MANSAB ALI[3], *AMIR USMAN*[4]

ABSTRACT

Background: Tobacco use is the single most important preventable health risk in the world and smoking-related mortality is set to rise in particular in developing countries including Pakistan. Smoking in surgical patients has been associated with local wound complications, pulmonary and cardiac complications, an increased need for postop intensive care and longer periods of hospitalisation.
Aim: To ascertain the prevalence of smoking in Pakistani surgical outpatients and to assess their smoking behaviour with a view to increase awareness and suggest appropriate interventions.
Study design: Cross-sectional survey
Method: 300 consecutive general surgical outpatients were asked to identify if they smoked and were invited to take part in a semi-structured survey. The questionnaire had inbuilt questions from CAGE screening questionnaire modified for smoking and in addition asked questions about smoking behaviour and motivation to quit.
Results: Prevalence of smoking in the study population was 45.6%. Out of these 45.2% screened positive for nicotine dependence. Majority of smokers acknowledged their habit. Boredom, anxiety or worry and feeling angry, depressed or lonely were identified as common themes of emotional state linked to smoking behaviour. Almost all the smokers identified health improvement and money saving as potential benefits of quitting. About two third (67.3%) of the nicotine dependent group and a half (50.7%) of the non-dependent group thought it was difficult to give up smoking. Nonetheless a significant majority in the both groups, 67.3% of the nicotine dependent and 80.9% of the non-dependent group considered that it was a good thing to quit smoking.
Conclusion: Prevalence of smoking is high in Pakistani urban general surgical outpatients and is comparable to general population trends. A significant proportion of the smoking population may be dependent on nicotine. Smoking behaviour may be associated with a number of emotional states. Majority of the smokers are able to identify health and economic benefits of smoking cessation and have a positive attitude towards quitting despite thinking it may be difficult. Routine screening for smoking and nicotine dependence and appropriate support for smoking cessation and harm reduction should help promote a healthier lifestyle and improve outcomes in the pre and postoperative period.
Keywords: Smoking, nicotine, dependence, surgical

INTRODUCTION

Tobacco use is the single most important preventable health risk in the developed world, and an important cause of premature death worldwide. WHO has estimated that tobacco use is currently responsible for the death of about six million people across the world each year with many of these deaths occurring prematurely[1]. There has been a massive increase in tobacco use in the in the developing world in recent decades. Globally, smoking-related mortality is set to rise from 3 million 2030, with 70% of these deaths occurring in developing countries[2]. In 2010, WHO estimated that about 21% of Pakistan's population smoked. If tobacco control efforts continue at the same intensity, WHO projects that in 2025 around 24% of the population of Pakistan will be smokers. In 2010, WHO estimated that about 38% of men and about 4% of women smoked in Pakistan. By 2025, WHO projects the rate to be approximately 45% for men and 2% for women. In 2010, the highest rate of smoking among men was seen in the age-group 40 - 54; and among women in the age-group 70+[3].

Smoking causes a wide range of diseases, including many types of cancer, chronic obstructive pulmonary disease, coronary heart disease, stroke, peripheral vascular disease, and peptic ulcer disease. In addition, smoking during pregnancy adversely affects foetal and neonatal growth and development[4,5] Smoking in surgical patients has been associated with local wound complications, pulmonary and cardiac complications, an increased need for postoperative intensive care and longer

[1]Consultant Psychiatrist, Lincolnshire Partnership NHS Trust, UK
[2]ConsultantPsychiatrist, Nottinghamshire Healthcare, UK
[3]Professor of Surgery, Nawaz Sharif S S Hospital, Lahore
4Asst. Prof. Surgery, Nawaz Sharif S S Hospital, Lahore
Correspondence to Dr Raheel Aziz, Consultant Psychiatrist, Sycamore Centre, Beacon Lane, Grantham, England NG31 9DF
Email: draheelaz@gmail.com

periods of hospitalisation. Compared to non-smoking patients, patients who smoke perioperatively have been shown to experience more problems. Specifically, poorer outcomes have been associated with gastrointestinal, hernia, orthopaedic, cancer, cardiovascular, day care and plastic surgery[6].Smoking has also been implicated in a need for increased anaesthetic dosage and increased experience of postoperative pain[7,8].

PATIENTS AND METHODS

This cross-sectional descriptive study was conducted at the Department of General Surgery, Nawaz Sharif Social Security Hospital, Lahore during August and September 2016 after obtaining the relevant institutional approval. 300 consecutive patients presenting to general surgery outpatient department were asked if they smoked and were invited to take part in a semi-structured survey The survey questionnaire was based on modified CAGE screening questionnaire for smoking[15] and asked additional questions on the amount of average daily smoking, the reasons for smoking and if they smoked to relieve any uncomfortable feelings as identified by the options given in the questionnaire. The survey also enquired about potential benefits of quitting smoking and whether they had thought about quitting. Patient identifiable information was treated confidentially. The data was analyzed using Microsoft Excel and SISA (Simple Interactive Statistical Analysis) [16] and frequency tables with percentages were calculated. A cut-off score of 2 out of maximum 4 was used to identify nicotine dependence on questions based on modified CAGE questionnaire.

RESULTS

Out of the 300 consecutive patients presenting to surgical outpatient department, 137 (45.6%) patients identified themselves as smokers. Out of these, 12 patients declined to take part in the study and 115 participated. The patients who needed support in answering the questionnaire were assisted accordingly. Majority 107(93%) of the sample were male smokers, whilst only 8(7%) were females. The age range was 21-70 years with mean age of 44.9 years. Using the cut-off score of 2 out of maximum 4 on CAGE screening questions, 52(45.2%) smokers were identified as screening positive for nicotine dependence and they were exclusively male, all 52 (100%). There was no significant difference in the ages between the nicotine dependent and non-dependent group. The average daily consumption of tobacco in the dependent group was at least on pack of 20 cigarettes, 44% smoking between 21-30 cigarettes daily and 56% smoking more than 30 cigarettes a day.

With regards to their smoking behaviour, majority of the smokers identified this as a habit. All of the dependent group and 76% of the non-dependent group thought they smoked habitually. Common themes identified as emotional state or feelings during which they felt the need to smoke were: boredom, anxiety or worry and feeling angry, depressed or lonely. There was comparatively high expression of such associated emotional states in the dependent group compared to the non-dependent group. 96% of the dependent group identified more than one factor associated with their smoking habit. Whereas in the dependent group the predominant themes were boredom, anxiety or worry and feelings of anger, in the non-dependent group feelings of depression and loneliness were more common. Given the small number in individual subgroups, statistical significance analysis was not felt appropriate (Table 1).

Table 1: Characteristics of smokers, daily consumption and behaviour (n=115)

	Nicotine dependent	**Non dependent**
	n=52(45.2%)	n=63(54.8%)
Age (mean±SD)	45.25±12.28	44.54±10.21
Daily Amount		
10 or less		17 (26.9%)
11 to 20		46 (73.1%)
21 to 30	23 (44%)	
31/above	29 (56%)	
Reasons		
Habit	52 (100%)	48(76%)
Uncomfortable Feelings		
Boredom	37 (71%)	19(30%)
Anxiety or Worry	25(48%)	21(33%)
Angry	21(40%)	18(28.5%)
Depression	12(23%)	19(30%)
Loneliness	7 (13.5%)	12(19%)
More than one	50(96%)	26(41.3%)
Benefits of Quitting		
Improved Health	47(90%)	63(100%)
Money saving	52 (100%)	63(100%)
Attitude to Quitting		
Not Interested	17(32.7%)	12(19%)
Difficult to quit	35 (67.3%)	32(50.7%)
Good thing	35(67.3%)	51(80.9%)

Almost all of the smokers acknowledged the potential benefits of quitting in terms of improvement in health and saving money though a small proportion (10%) of the dependent group appeared to be in denial of the health benefits of giving up smoking. Similarly about one third (32.7%) of the dependent group and about one fifth (19%) of the non-dependent group had negative attitude towards quitting and were not

interested in giving up smoking. About two third (67.3%) of the nicotine dependent group and a half (50.7%) of the non-dependent group thought it was difficult to quit smoking. Nonetheless a significant majority in the both groups, 67.3% of the nicotine dependent and 80.9% of the non-dependent group considered that it was a good thing to quit smoking.

DISCUSSION

This cross-sectional study of Pakistani surgical outpatients found that prevalence of smoking was 45.6%, with a high proportion of smokers to be male. The mean age of smokers was 44.9 years with age range of 21-70 years. The results are in keeping with the general population trends for smoking as indicated in the WHO studies. Using the cut-off score of 2 out of maximum 4 on CAGE screening questions, 45.2% smokers screened positive for possible nicotine dependence. The average daily consumption of tobacco in the dependent group was at least on pack of 20 cigarettes, 44% smoking between 21-30 cigarettes daily and 56% smoking more than 30 cigarettes a day. We used questions based on the CAGE questionnaire that is a simple and accurate tool and has been used for many years to screen patients for addictive disorders.[17] The CAGE questions have been revised to apply to smoking behaviour[15] and can be embedded in a clinical interview.

Smoking in surgical patients has been associated with local wound complications, pulmonary and cardiac complications, an increased need for postoperative intensive care and longer periods of hospitalisation. Compared to non-smoking patients, patients who smoke perioperatively have been shown to experience more problems. Acute smoking has been associated with increased ST depression during anesthesia[18] specifically; poorer outcomes have been associated with gastrointestinal, hernia, orthopaedic, cancer, cardiovascular, day care and plastic surgery[19]. Smoking has also been implicated in a need for increased anaesthetic dosage and increased experience of postoperative pain[7].

Main acute effects of smoking on the body include: Increase in sympathetic tone leading to increase in blood pressure, heart rate and peripheral vasoconstriction leading to an increased demand for oxygen and cardiac function[20] , formation of carboxyhaemoglobin leading to reduction in oxygen delivery to the tissues[21] and reduction in oxygen storage in the muscles,[22] increase in red cell production which leads to increase in blood viscosity, a decrease tissue perfusion and decrease in oxygen delivery to the tissues[8] hypersecretion of mucus, narrowing of the small airways, decrease in ciliary function and change in mucus rheology leading to a decrease in mucociliary transport[8] , changes in functioning of a range of immune cells (pro and anti-inflammatory cytokines, white blood cells, immunoglobulins) which lead to decreased immunity[8] and induction of hepatic enzymes which increases drug metabolism through both pharmacokinetic and pharmacodynamic mechanisms[23].

Many of the adverse health effects of smoking are reversible, and smoking cessation treatments are amongst the most cost effective of all healthcare interventions. In order to improve smoking cessation rates, effective behavioural and pharmacological treatments, coupled with professional counselling and advice, are required. Since smoking duration is the principal risk factor for smoking-related morbidity, the treatment goal should be early cessation and prevention of relapse[5].

With regards to their smoking behaviour, the entire dependent group in our study and 76% of the non-dependent group thought they smoked habitually. The criteria in the *Diagnostic and Statistical Manual of Mental Disorders*, 4th ed. (DSM-IV)[24] can be used along with the CAGE questionnaire to diagnose substance dependence. These criteria apply to all addictive substances and can be grouped into four categories that conveniently begin with the letter “C”: These include Compulsion—the intensity with which the desire to use a chemical overwhelms the patient's thoughts, feelings and judgment, Control—the degree to which patients can (or cannot) control their chemical use once they have started using, Cutting down—the effects of reducing chemical intake; withdrawal symptoms and Consequences—denial or acceptance of the damage caused by the chemical.

There was comparatively high expression of associated emotional states in the dependent group compared to the non-dependent group. 96% of the dependent group identified more than one factor associated with their smoking habit. Whereas in the dependent group the predominant themes were boredom, anxiety or worry and feelings of anger, in the non-dependent group feelings of depression and loneliness were more common. It is possible that anxiety and anger or irritability is indeed a manifestation of relative withdrawals symptoms that the dependent smokers try to manage through further smoking. On the contrary these could also represent acute effects of nicotine given rather heavy smoking in this group of patients. Because many smokers view cigarettes as a tool to attenuate stress[25,26]. Nicotine Replacement Therapy could assist smokers in managing the considerable psychological stresses associated with surgery.

Almost all of the smokers in our study acknowledged the potential benefits of quitting in terms of improvement in health and saving money though a small proportion (10%) of the dependent group appeared to be in denial of the health benefits of giving up smoking. About two third (67.3%) of the nicotine dependent group and a half (50.7%) of the non-dependent group thought it was difficult to quit smoking. Nonetheless a significant majority in the both groups, 67.3% of the nicotine dependent and 80.9% of the non-dependent group considered that it was a good thing to quit smoking.

Smoking cessation has been proven to be associated with significant postoperative benefits such as reduced risk of pulmonary complications such as respiratory failure, need for postoperative respiratory therapy or admission to intensive care[11] ; decreased risk of graft failure[27] decreased wound related complications such as dehiscence and infection[8] increased rate of bone healing,[20,28]reduced length of admission[29]. Permanent smoking cessation reduces the risk of heart disease, stroke, cancer and premature death[9].

Smoking cessation interventions have been proven effective for hospitalised patients in general[30] and specifically for surgical patients[31,32] and increase the rate of long term quitting if they include regular behavioural support and pharmacotherapy that is continued at least 1 month after discharge. NICE (National Institute of Clinical Excellence) UK guidance[33] has recommended that smoking cessation interventions should be offered to surgical patients, and health professionals are encouraged to access training, deliver brief advice, offer pharmacological support and refer patients to local specialist services. The Department of Health, UK's guidance, "Smoking Cessation in Secondary Care"[33] is designed to be practical for busy healthcare professionals and outlines a care pathway for supporting smoking cessation that can be adopted for surgical patients. In essence, this recommends a very brief intervention using the 3A's: Ask and record smoking status, Advise the patient of the personal health benefits of stopping smoking, Act on the patient response that may include prescribing Nicotine Replacement Therapy and referral to a dedicated Stop Smoking Service. We don't have dedicated Stop Smoking Services in Pakistan, however the above simple intervention can be easily undertaken by the surgeons and anaesthetists and other clinicians. Although to gain maximum benefit, a smoking cessation attempt needs to begin at least 8 weeks before surgery[33] and lead to permanent quitting however, temporary abstinence beginning immediately around the time of surgery and lasting until a patient has recovered may still have worthwhile benefits.

CONCLUSION

Prevalence of smoking is high in Pakistani urban general surgical outpatients and is comparable to general population trends. A significant proportion of the smoking population may be dependent on nicotine. Smoking behaviour may be associated with a number of emotional states. Majority of the smokers are able to identify health and economic benefits of smoking cessation and have a positive attitude towards quitting despite thinking it may be difficult. Routine screening for smoking and nicotine dependence and appropriate support for smoking cessation and harm reduction should help promote a healthier lifestyle and improve outcomes in the pre and postoperative period. Busy clinicians, surgeons and anaesthetists should encourage abstinence even if temporary around the time of surgery by asking about the smoking status, advising them of the personal health benefits of quitting. Prescribing Nicotine Replacement Therapy and dedicated counselling service may be a useful way forward to help people overcome their nicotine dependence.

REFERENCES

1. WHO global report on trends in prevalence of tobacco smoking. Geneva .World Health Organization. 2015.
2. World Health Organization. Tobacco or health: a global status report. Geneva: World Health Organization, 1997.
3. WHO global report on trends in prevalence of tobacco smoking. Geneva .World Health Organization. 2015.
4. WHO Global Report: Mortality Attributable to Tobacco, World Health Organisation, Geneva, 2012.
5. Fagerström, K. The Epidemiology of Smoking: Health Consequences and Benefits of Cessation Drugs (2002) 62(Suppl 2): 1. doi:10.2165/00003495-200262002-00001
6. Lindstrom D. Impact of tobacco use on post operative complications ISBN 978-91-7 409-071-0 Karolinska Institute. 2008.
7. Warner DO. Tobacco control for anesthesiologists. Journal of Anesthesia 2007; 21(2): May.
8. Moller A, Tonnesen H. Risk reduction: perioperative smoking intervention. Best practice and research clinical anaesthesiology 2006; 20(2):237-248.
9. Doll R, Peto R, Boreham J, Sutherland I. Mortality in relation to smoking: 50 years' observations on male British doctors. BMJ 2004; 328:1519.
10. Theadom A, Cropley M. Effects of preoperative smoking cessation on the incidence and risk of intraoperative and postoperative complications in adult smokers: a systematic review. Control 2006; 15:352-358.

11. Warner DO. Helping surgical patients quit smoking: Why, When, and How. Medical Intelligence 2005; 101:481-487.
12. Ahmed M, Alam SN, Khan O, Manzar S. Post-operative wound infection: a surgeon`s dilemma. Pak J Surg. Jan - Mar 2007; 23(1):41-7.
13. Munir K, Iqbal J, Ali MZ et al. Factor responsible for higher complication rate in patients operated for perforated peptic ulcer. J Sheikh Zayed Med Coll Apr - Jun 2011; 2(2):160-4.
14. Khan GA, Malik LM, Jahangir M. Prevalence of smoking, alcohol, and comorbid conditions in psoriasis. J Pak Assoc Derma Oct - Dec 2010;20(4):212-6.
15. Lairson DR, Harrist R, Martin DW, Ramby R, Rustin TA, Swint JM, et al. Screening for patients with alcohol problems: severity of patients identified by the CAGE. *J Drug Educ*. 1992;22:337–52.
16. Uitenbroek, D. G. (1997). *SISA Binomial.* Southampton: D.G. Uitenbroek. Web: http://www.quantitativeskills.com/sisa/distributions/binomial.htm
17. Crowe RR, Kramer JR, Hesselbrock V, Manos G, Bucholz KK. The utility of the Brief MAST and the CAGE in identifying alcohol problems: results from national high-risk and community samples. *Arch Fam Med*. 1997;6:477–83.
18. Woehlck HJ, Connolly LA, Cinquegrani MP, Dunning MB, III, Hoffmann RG. Acute smoking increases ST depression in humans during general anaesthesia.[see comment]. Anesthesia & Analgesia 1999; 89(4):856-860.)
19. Lindstrom D. Impact of tobacco use on post operative complications ISBN 978-91-7 409-071-0 Karolinska Institute. 2008.
20. Warner DO. Perioperative abstinence from cigarettes: physiologic and clinical consequences. Anesthesiology 2006; 104:356-367.
21. Rietbrock N, Kunkel S, Worner W, Eyer P. Oxygen-dissociation kinetics in the blood of smokers and non-smokers: interaction between oxygen and carbon monoxide at the hemoglobin molecule. Nanunyn Scmiedebergs Arch Pharmacol 1992; 98:528-534.
22. Akrawi W, Benumof JL. A pathophysiological basis for informed preoperative smoking cessation counselling. www.dh.gov.uk/publications Journal of cardiothoracic and vascular anaesthesia 1997; 11(5):629-640.
23. Zevin S, Benowitz NL. Drug interactions with tobacco smoking. An update. Clinical Pharmacokinetics 1999; 36(6):425-438.
24. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4th ed. Washington, D.C.: American Psychiatric Association, 1994:18
25. Parrott AC: Stress modulation over the day in cigarette smokers. Addiction 1995; 90:233–44 ,
26. Cohen S, Lichtenstein E: Perceived stress, quitting smoking, and smoking relapse. Health Psychol 1990; 9:466–78 0
27. Willigendael EM, Teijink JA, Bartelink ML, Peters RJ, Buller HR, Prins MH. Smoking and the patency of lower extremity bypass grafts: a meta-analysis. Journal of Vascular Surgery 2005; 42(1):67-74.
28. Haverstock BD, Mandracchia VJ. Cigarette smoking and bone healing: implications in foot and ankle surgery. The journal of foot and ankle surgery 1998; 37(1):69.
29. Moller AM, V. Effect of preoperative smoking intervention on postoperative complications: A randomised clinical trial. Lancet 2002; 359(9301):12. 4) Doll R, Peto R, Boreham J, Sutherland I. Mortality in relation to smoking: 50 years' observations on male British doctors. BMJ 2004; 328:1519.
30. Rigotti N, Munafo 'MR, Stead LF. Interventions for smoking cessation in hospitalised patients. Cochrane Database of Systematic Reviews 2007; Issue3.Art.No.:CD001837.DOI:10.1002/14651858.CD001837.pub2.
31. Moller A, Villebro N. Interventions for preoperative smoking cessation. Cochrane Database of Systematic Reviews 2003; Issue 3. Art.No.:CD002294.DOI:10.1002/14651858.CD002294.pub2.
32. Cropley MT. The effectiveness of smoking cessation interventions prior to surgery: A systematic review. Nicotine and Tobacco Research 2008; 10(3): Mar.
33. Department of Health. Stop smoking interventions in secondary care. 2009
.