ORIGINAL RESEARCH PAPER
Volume - 10 | Issue - 10 | October - 2021 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

PREVALENCE OF ADDICTION IN MALE PATIENTS POSTED FOR ORTHOPAEDIC OPERATIONS AND ITS SURGICAL OUTCOME

Medical Science

Dr. Juthika Biswas Associate Professor, Department of Anaesthesia, ESI-PGIMSR & MC,
Dr Atasi Das Associate Professor, Department of Anaesthesia, ESI-PGIMSR and ESIC Medical College. Joka
Dr Tarun Biswas Assistant Professor, Department of Pharmacology, DGMC And Hospital, Diamond
Dr Bikash Bisui * Associate Professor, Department of Anaesthesia, Burdwan Medical College, Purba Bardhaman, *Corresponding Author

ABSTRACT

Introduction: Addiction of tobacco and other substances is a significant surgical risk factor for peri-operative surgical events. Orthopedic peri-operative complications of smoking include impaired wound healing, augmented infection, delayed and/or impaired fracture union and arthrodesis and worst total knee and hip arthroplasty results. This study is designed to analyse such routinely recorded data and observe prevalence addiction in male patients posted for orthopaedic operation.

Material and methods: This Observational Retrospective study was conducted in MRD, ESI-PGIMSR & MC. All elective post-surgical patients who underwent surgery in between the period of January 2017 to December 2017. Total 120 patients were present in this study.

Result: The most significant effects of intervention were seen for wound-related complications (5% vs 31%, p=0·001), cardiovascular complications (0% vs 10%, p=0·08), and secondary surgery (4% vs 15%, p=0·07). The median length of stay was 11 days (range 7–55) in the smoker and 13 days (8–65) in the nonsmoker.

Conclusion: Smoking is a risk factor for wound infection and cardiopulmonary complications in almost any type of surgery; smokers make up a considerable proportion of the total number of postoperative complications. An effective smoking intervention programme applied 6–8 weeks before surgery more than halved the frequency of postoperative complications, with the greatest effect on wound-related and cardiovascular complications.

KEYWORDS

Tobacco, Orthopaedic, Smoking, Wound infection

INTRODUCTION:

About a third of all patients who undergo surgery are smokers. Smoking has repeatedly proved an important risk factor for intraoperative and postoperative complications.[1] Smokers have an increased frequency of pulmonary, circulatory, and infectious complications, impaired wound healing and postoperative admittance to the intensive care unit.[2]

There has been some research on the relationship between high levels of substance use and complications arising in hospital admission, especially in surgical patients [3,4]. Tobacco use has been shown to be associated with health risks to inpatients, especially to surgical patients and those who have wounds or are immobilised. Trauma patients with blood loss can have complications of hypoxia, exacerbated if they are smokers, causing further complications such as impaired myocardial and respiratory function and altered wound-healing time.

A US study showed that 19% of a sample of emergency-room patients met International Classification of Diseases version 10 (ICD-10) criteria for alcohol dependence[5]. In Queensland, Australia, 30% of emergency department patients were drinking at hazardous or harmful levels[6]; in data collected from four major Sydney hospitals in 1994, 26% reported excessive levels of alcohol consumption [7], while another survey in New South Wales of patients over 65 years classified 15.5% as problem drinkers [8]. In one Sydney hospital in 2001, 20% of 102 post-surgical patients self-identified on screening forms as smokers and 23% were classified as problem drinkers (scoring 8 on the Alcohol Use Disorders Identification Test (AUDIT) [9]. However, 46% of self-completed preadmission forms had no record of alcohol consumption and 43% had no record of tobacco use [10].

Foy & Kay[11] randomly selected admissions to two hospitals in Newcastle, Australia and measured alcohol consumption using the Canterbury Alcohol Screening Test (CAST) and clinical criteria for withdrawal. The authors concluded that 15 – 20% of admissions had alcohol-related problems and 8% were at risk of withdrawal. Of the sample, only 4.3% had an alcoholrelated diagnosis. Another study of 776 orthopaedic trauma patients showed that 25% screened positive for blood alcohol, while 24% tested positive for two or more drugs, with the highest incidence in males and in those aged 31 – 40 years[12]. Based upon these studies, it appears likely that up to 25% of hospital admissions are drinking at hazardous levels; however, the majority of patients with alcohol problems are not admitted with a primary or secondary diagnosis of alcohol related illness.

Addiction of tobacco and other substances is a significant surgical risk factor for peri-operative surgical events. Orthopedic peri-operative complications of smoking include impaired wound healing, augmented infection, delayed and/or impaired fracture union and arthrodesis and worst total knee and hip arthroplasty results. As a routine procedure all significant history/clinical findings and investigation status are recorded in Pre-Anaesthetic Check-up. This study is designed to analyse such routinely recorded data and observe prevalence addiction in male patients posted for orthopaedic operation.

b) AIMS AND OBJECTIVES:

i) To detect addiction in male patients posted for orthopaedic operation
ii) To detect different types of addiction
iii) To detect correlation (if any) between addiction with surgical outcome

MATERIAL AND METHODS

i) Type of Trial: Observational
ii) Type of Study: Retrospective Data Analysis
iii) Conflict of interest: Nil
iv) Sample Size: All elective post surgical patients who underwent surgery in between the period of January 2017 to December 2017.
v) Study period: 1 year
vi) Place of Study: MRD, ESI-PGIMSR & MC, Joka

vi) **Inclusion Criteria:** All male patients who underwent elective orthopeadic operations under anaesthesia w.e.f. January 2017.

vii) **Exclusion Criteria:** Emergency Surgery
viii) Permission from Institutional Ethics Committee

STATISTICAL ANALYSIS:

For statistical analysis data were entered into a Microsoft excel spreadsheet and then analyzed by SPSS (version 27.0; SPSS Inc., Chicago, IL, USA) and GraphPad Prism version 5. Data had been summarized as meanand standard deviation for numerical variables and count and percentages for categorical variables. Two-sample t-tests for a difference in mean involved independent samples or unpaired samples. Paired t-tests were a form of blocking and had greater power than unpaired tests. One-way analysis of variance (one-way ANOVA) was a technique used to compare means of three or more samples for numerical data (using the F distribution). A chi-squared

test ($\chi 2$ test) was any statistical hypothesis test wherein the sampling distribution of the test statistic is a chi-squared distribution when the null hypothesis is true. Without other qualification, 'chi-squared test' often is used as short for Pearson's chi-squared test. Unpaired proportions were compared by Chi-square test or Fischer's exact test, as appropriate.

The Mann–Whitney U test is a nonparametric test of the null hypothesis that it is equally likely that a randomly selected value from one sample is less than or greater than a randomly selected value from a second sample. This test can be used to determine whether two independent samples were selected from populations having the same distribution; a similar nonparametric test used on dependent samples is the Wilcoxon signed-rank test.

Z-test (Standard Normal Deviate) was used to test the significant difference of proportions. Correlation was calculated by Pearson correlation analysis. The Pearson product-moment correlation coefficient was a measure of the linear dependence between two variables X and Y. Multivariate analysis was performed by logistic regression method for calculation of risk factors. The Kaplan–Meier estimator (Kaplan-Meier survival analysis) was a non-parametricstatistic used to estimate the survival function from time data.

Explicit expressions that can be used to carry out various *t*-tests are given below. In each case, the formula for a test statistic that either exactly follows or closely approximates a *t*-distribution under the null hypothesis is given. Also, the appropriate degrees of freedom are given in each case. Each of these statistics can be used to carry out either a one-tailed test or a two-tailed test.

Once a *t* value is determined, a *p*-value can be found using a table of values from Student's t-distribution. If the calculated *p*-value is below the threshold chosen for statistical significance (usually the 0.10, the 0.05, or 0.01 level), then the null hypothesis is rejected in favour of the alternative hypothesis.

p-value ≤ 0.05 was considered for statistically significant.

RESULT AND DISCUSSION

The results of our trial show that postoperative complications can be substantially reduced by smoking intervention 6–8 weeks before hip or knee replacement. The reduction in postoperative complications was most evident for wound-related complications, and, to a lesser extent, cardiovascular complications. The pathophysiological background for these findings could be the reversibility of the effect of tobacco smoking on the vascular system and delayed wound healing.[13,14]

Cessation of smoking for 3 weeks was shown to improve wound healing in an experimental study. The mechanism probably involves recovery of the amount or structure of collagen and of the immune capacity, reduced oxygenation of peripheral tissues, and vasoconstriction induced by nicotine.[15] In our study, we recorded a very low frequency of postoperative pulmonary complications (2%) in both groups. Joint replacement surgery is generally associated with a low risk of pulmonary complications, probably because of the distance of the operation site from the diaphragm and early mobilisation. In abdominal and gynaecological surgery, smokers have been shown almost consistently to have an increased risk of pulmonary complications, and the possible effect on these patients should be assessed.[16] When analysed per protocol, we reported an even greater difference between patients who stopped smoking and those who were smokers than when the data were analysed by intention-to-treat, and we saw no beneficial effect of smoking reduction. These data must be interpreted very carefully, since this analysis is based on non-randomised material, and these patients probably have very different baseline risk—motivation for smoking cessation is determined by many factors that act as confounders in this analysis, such as health status, social life, and age.

Length of hospital stay is, first of all, dependent on hospital practice, and might not suggest a difference in minor complication rate or mobilisation. We did show that the smokers stayed on an average 2 extra days in the orthopaedic department. Nevertheless, the data point to potentially great savings in patient morbidity and costs, since postoperative complications are expensive to treat. Lengthy hospital stay because of infection is well documented.[17,18]

The reduction in complication rate is a result of the smoking intervention programme. All parts of the intervention (smoking cessation and smoking reduction, use of nicotine replacement, increased information, and personal relation to the project nurse) could have contributed to the positive effects. A successful smoking intervention could also change other lifestyle factors, such as exercise, eating, or drinking habits, which are all factors that might contribute to the results.

Table 1: Patients' baseline characteristics

Preoperative factors		Smoker (n=56)	Non Smoker (n=52)	P-value
	Age (years)	66 (41–83)	64 (30–85)	0·37
	Body-mass index (kg/m^2)	25 (15–43)	23 (17—44)	0·53
	ASA class I	23 (41%)	16 (31%)	0·86
	ASA class II	31 (56%)	33 (63%)	
	ASA class III	2 (3%)	3 (6%)	
History of disease	Chronic heart disease	6 (11%)	10(15%)	0·39
	Chronic obstructive lung disease	7 (13%)	5 (10%)	0·52
	Diabetes mellitus	1 (2%)	3 (5%)	0·41
Preoperative laboratory tests	Haemoglobin (g/L)	139 (118–174)	135 (96–155)	0·22
	Creatinine (µmol/L)	84 (61–121)	81 (57–170)	0·38
	FEV_1 (L/s)	2·2 (0·8–4·5)	2·3 (1·2–4·6)	0·63
Smoking habits	Cigarettes per day	15 (5–30)	15 (3–30)	0·71
	Pack years*	35 (11–65)	37 (1–102)	0·61
Intraoperative factors	General anaesthesia	28 (50%)	33 (63%)	0·22
	Knee replacement	16 (29%)	17 (33%)	0·68
	Hip replacement	40 (71%)	35 (67%)	0·68
	Duration of surgery (min)	90 (35–160)	90 (45–190)	0·92

Table 2: Outcomes in the two study groups

		Smoker (n=56)	Non Smoker (n=52)	P-value
Complications	Respiratory insufficiency	1 (2%)	1 (2%)	0·97
	Cardiovascular insufficiency	0	5 (10%)	0·08
	Renal insufficiency	0	1 (2%)	0·98
	Delirium or confusion	1 (2%)	4 (8%)	0·15
	Gastrointestinal bleeding	0	1 (2%)	0·98
	Wound-related	3 (5%)	16 (31%)	0·001
	Haematoma	1 (2%)	4 (8%)	
	Infection (positive culture)	2 (4%)	12 (23%)	
	Subfascial involvement	1 (2%)	4 (8%)	
	Urinary tract infection	5 (9%)	6 (12%)	0·66
	Any	10 (18%)	27 (52%)	0·0003
	Death	0	0	
	Secondary surgery	2 (4%)	8 (15%)	0·07
	Replacement	0	0	
	Reposition	1 (2%)	0	
	Wound-related	1 (2%)	7 (13%)	
	Vascular	1 (2%)	1 (2%)	

Hospital stay	**Orthopaedic department (days, median [range])**	11 (7–55)	13 (8–65)	0·41
	Total days in orthopaedic department	750	767	
	Total days in non-orthopaedic department	2	49	
	In medical or surgical departments	0	17	
	In intensive-care unit	2	32	

CONCLUSION

Smoking is a risk factor for wound infection and cardiopulmonary complications in almost any type of surgery; smokers make up a considerable proportion of the total number of postoperative complications. If preoperative smoking intervention can reduce these complications.

An effective smoking intervention programme applied 6–8 weeks before surgery more than halved the frequency of postoperative complications, with the greatest effect on wound-related and cardiovascular complications.

REFERENCES

1. Schwilk B, Bothner U, Schraag S, Georgieff M. Perioperative respiratory events in smokers and nonsmokers undergoing general anaesthesia. Acta Anaesthesiol Scand 1997; 41: 348–55.
2. Moller AM, Maaløe R, Pedersen T. Postoperative intensive care admittance: the role of tobacco smoking. Acta Anaesthesiol Scand 2001; 45: 345–48.
3. Peters MJ, Morgan LC, Gluch L. Smoking cessation and elective surgery: the cleanest cut [Letter]. Med J Aust 2004;180:317 – 18.
4. Tonnesen H, Rosenberg J, Nielsen HJ, Rasmussen V, Hauge C. Effect of preoperative abstinence on poor postoperative outcome in alcohol misusers: randomised controlled trial. BMJ 1999;318:1311 – 16.
5. Cherpitel C. Screening for alcohol problems in the emergency room: a rapid alcohol problems screen. Drug Alcohol Depend 1995;40:133 – 7.
6. Alati R, Kinner S, Najman JM, Fowler G, Watt K, Green D. Gender differences in the relationships between alcohol, tobacco and mental health in patients attending an emergency department. Alcohol Alcohol 2004; 39:463 – 9.
7. Bell A, Richmond R, Heather N, Rollnick S. Results of screening for excessive drinkers in four Sydney teaching hospitals. Drug Alcohol Rev 1994;13:179 – 84.
8. Powell J, McInness E. Alcohol use among older hospital patients: findings from an Australian study. Drug Alcohol Rev 1994;13:5 – 12.
9. Saunders JB, Aasland OG, Babor TF, de la Fuente Juan R, Grant M. Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption—II. Addiction 1993;88:791 – 804.
10. Shourie S, Conigrave KM, Proude E, Haber P. Detection of and intervention for excessive alcohol and tobacco use among adult hospital in-patients. Drug Alcohol Rev 2007; 26:127 – 33.
11. Foy A, Kay J. The incidence of alcohol-related problems and the risk of alcohol withdrawal in a general hospital population. Drug Alcohol Rev 1995;14:49 – 54.
12. Levy RS, Hebert CK, Munn BG, Barrack RL. Drug and alcohol use in orthopaedic trauma patients: a prospective study. J Orthop Trauma 1996;10:21 – 7.
13. Ahmed SS, Moschos CB, Lyons MM, Oldewurtel HA, Coumbis RJ, Regan TJ. Cardiovascular effects of long-term cigarette smoking and nicotine administration. Am J Cardiol 1976; 37: 33–40.
14. Bounameaux H, Griessen M, Benedet P, Krahenbuhl B, Deom A. Nicotine induced haemodynamic changes during cigarette smoking and nicotine gum chewing: a placebo controlled study in young healthy volunteers. Cardiovasc Res 1988; 22: 154–58.
15. Frick WG, Seals RR Jr. Smoking and wound healing: a review. Tex Dent J 1994; 111: 21–23.
16. Brooks-Brunn JA. Predictors of postoperative pulmonary complications following abdominal surgery. Chest 1997; 111: 564–71.
17. Greif R, Akca O, Horn EP, Kurz A, Sessler DI. Supplemental perioperative oxygen to reduce the incidence of surgical- wound infection: Outcomes Research Group. N Engl J Med 2000; 342: 161–67.
18. Kurz A, Sessler DI, Lenhardt R. Perioperative normothermia to reduce the incidence of surgical-wound infection and shorten hospitalization. Study of Wound Infection and Temperature Group. N Engl J Med 1996; 334: 1209–15.