Original Article

Effects of Smoking on Systemic Blood Pressure, Serum Cholesterol and Serum Bilirubin in Medical Students

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ABSTRACT

Objective: To determine the effects of smoking on systemic blood pressure, serum cholesterol and serum bilirubin in medical students.
Study Design: Case control study
Place & Duration: This study was conducted at the Liaquat University of Medical and Health Sciences Hospital from June 2014 to November 2014.
Materials and Methods: A sample of 100 medical students was divided into 50 smokers and 50 non-smokers. Age, weight, smoking duration, blood pressure, serum cholesterol and serum bilirubin were collected in a pre structured proforma. Data was analyzed by statistical package *SPSS 22.0*.
Results: Duration, cigarettes smoked and pack year of cigarette smoked were noted as 3.85 ± 3.96 years, 10.25 ± 3.57 and 1.7±0.56 respectively (p=0.0001). Mean systolic and diastolic BP in smokers and non-smokers noted as 143.9±12.67 and 135.1±15.24 (p=0.002), 75.6±9.72 and 67.9±6.06 mmHg (0.0001) respectively. Similarly serum bilirubin and cholesterol were noted as 0.99±0.27 and 1.13±0.20 (p=0.005), 156.5±18.6 and 119.3±22.70 mg/dl (p=0.0001) respectively.
Conclusion: The present study reports high systemic blood pressure and serum cholesterol and low serum bilirubin in the smokers. Preventive strategies must be implemented to quit the smoking by youngsters.
Key Words: Smoking, Blood pressure, Cholesterol, Bilirubin, Medical students

INTRODUCTION

Tobacco cigarette smoking is one of the preventable causes of mortality and morbidity the World over. If smoking quit is encouraged it may reduce the mortality. A previous study reported that the tobacco related deaths will multiply many time over next 3- 5 decades if it is not discouraged.[1] Morbid effects of cigarette smoking are well documented, with evidence of a decrease in life. Previous studies reported that the smokers die ten years than non-smokers.[2,3] Tobacco smoking is a addicting habit and people crave for it once they have begun. In particular, when the youngsters are addicted, then it will be very dangerous for the health due to more life and more exposure to tobacco smoke.[4] Tobacco smoke has association with the cardiovascular diseases (CVD) which is a leading cause of death globally.[5]

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Mortality due to CVD related now accounts for one-third cases globally. It is leading cause of death in both developing and developed countries.[6] Both tobacco smoking and CVD are eminently preventable conditions. Systemic high blood pressure is termed as the 'systemic hypertension' which is a increasing globally. Hypertension is preventable cause of CVD by multiple strategies as quitting tobacco smoking and physical activity.[7,8] Systemic hypertension damages the target organs which include the; heart, eye, brain, and kidneys. Proper preventive measures and removal of risk factors such as tobacco smoking may greatly help to reduce the burden of health problems.[9] Vascular disorders of heart, brain and kidney are also associated even with the suboptimal blood pressure (BP).[10] A previous study reported vascular injury may occur even with suboptimal systolic BP >115 mmHg).[6] Several studies[11-13] have established the association of tobacco cigarette smoking, hyperlipidemia and systemic high blood pressure. The present study was conceived keeping in view the significance of cigarette smoking is increasing in the youngsters, in particular the medical students. Medical students smoke cigarette as time pass, social taboos, alleviate exam anxiety and as a symbol social dignity.[11-13] As the medical students are future of health care providers, there is dire need to highlight the issue of smoking with special reference to high blood pressure and blood lipids. These maladies are

preventable cause of mortality. The present study is first type of its design which highlights the neglected social problem of cigarette smoking young medical students. The present study analyzed the health hazards of cigarette smoking with special reference to systemic blood pressure and serum cholesterol.

MATERIALS AND METHODS

This case control study was conducted in Liaquat University of Medical and Health Sciences Hospital from June 2014 to November 2014. The subjects were the medical students who voluntarily provided the information in the pre designed proforma. Study was launched after ethical clearance from Institutional Ethical Committee. A sample of 100 medical students was divided into 50 smokers and 50 non-smokers. Age, weight, smoking duration, blood pressure, serum cholesterol and serum bilirubin were collected in a pre structured proforma. Age of 19- 26 years and male subjects were the inclusion criterion. Subjects with history of family systemic hypertension, diabetes mellitus, hyperlipidemia, female students and coronary artery disease were excluded. Also subjects taking multivitamin, anti oxidant pills, and drugs were excluded. Study protocol was explained and data confidentially was secured. Students were informed that the data will be confidential and will never be disclosed in public even after study is published. Personal and family history, systemic blood pressure, body weight and blood sampling was performed under standard protocol. Nonsmoker was defined as one who never smoked cigarettes. An occasional smoker was exclusion also. Voluntary subjects were asked to sign proforma and consent form. Cigarette smoke as "Pack years" was calculated as "No. of cigarettes smoked per day × No. of years smoked/20".[14] Systemic blood pressure was measured according to JNC criteria VII; first by auscultatory method followed by palpatory method using mercury sphygmomanometer. 5 – 10 minutes rest was mandatory for each participant before recording blood pressure. Data was collected on a predesigned proforma. Consent forms were designed for volunteers and were kept confidential. Statistical analysis was done by statistical software SPSS 22.0 version (IBM Corporation, USA) for windows. Continuous and categorical data variables were analyzed by student's t test and Chi square test respectively. All data analysis was performed at 95% (P≤ 0.05).

RESULTS

Demography and biochemical findings of study subjects are shown in table 1. Age and body weight between two groups were similar (p>0.05). Mean± SD duration, cigarettes smoked and pack year of cigarette smoked were noted as 3.85 ± 3.96 years, 10.25 ± 3.57 and 1.7±0.56 respectively (p=0.0001).

Table No.1: Demography and biochemical findings of study subjects

	Smokers (n=50) Mean± SD	Non-smokers (n=50) Mean± SD	P-value
Age (years)	24.7±2.45	24.8±2.30	0.86
Body weight (kg)	68.9±7.30	68.5±4.54	0.74
Systolic BP (mmHg)	143.9±12.67	135.1±15.24	0.002
Diastolic BP(mmHg)	75.6±9.72	67.9±6.06	0.0001
Serum Bilirubin (mg/dl)	0.99±0.27	1.13±0.20	0.005
Serum Cholesterol (mg/dl)	156.5±18.6	119.3±22.70	0.0001

Mean systolic and diastolic BP in smokers and non-smokers reveals significant differences noted as 143.9±12.67 and 135.1±15.24, 75.6±9.72 and 67.9±6.06 mmHg respectively (p=0.002 and 0.0001). Similarly serum bilirubin and cholesterol were noted as 0.99±0.27 and 1.13±0.20 (p=0.005), 156.5±18.6 and 119.3±22.70 mg/dl (p=0.0001) respectively.

DISCUSSION

The present research is the first study which highlights the health hazards of cigarette smoking in medical students. The present study is of public health significance as it includes the young social class of medical students who will take the responsibility of health care provider in the future. As the medical curriculum is stressful, the examination anxiety and worries drag the students to alleviate by one or other means such as cigarette smoking which is easily available. Taste craving behavior and wrong friendship are other causes of cigarette smoking in medical students. The present study could recruit only fifty smokers. Mean age shows, majority belonged to third decade of life. Mean± SD duration, cigarettes smoked and pack year of cigarette smoked were noted as 3.85 ± 3.96 years, 10.25 ± 3.57 and 1.7±0.56 respectively (p=0.0001). The findings are in agreement with a recent study of Jena et al[15] and others.[16-18] Mean systolic and diastolic BP in smokers and non-smokers reveals significant differences noted as 143.9±12.67 and 135.1±15.24, 75.6±9.72 and 67.9±6.06 mmHg respectively (p=0.002 and 0.0001). This show the smokers were having high mean systolic and diastolic BP, the findings are in agreement with previous studies.[16-18] This show the smokers were having high mean systolic and diastolic BP, the findings are in agreement with previous studies.[15-18] Several studies[15-18] have been conducted

to find the association of cigarette smoking and high blood pressure, but controversial results have been reported. Some of previous studies[15-18] reported strong association of cigarette smoking and high systemic blood pressure; the findings are in keeping with present study. While other studies[19-21] reported no such association, this is controversial and inconsistent with present and previous studies[15-20] The present study reports raised systolic and diastolic BP in smokers (p=0.05) as shown in table 1. Highly controversial results are reported by previous studies,[22-24] which reported the cigarette smoking decreases the systemic blood pressure. This is highly controversial and paradoxical and might be due to technical errors in biostatistial analysis, different social population, different geographical areas and researcher bias. Previous studies reported that the rise in systemic blood pressure may be due to the nicotine mediated stimulation of sympathetic stimulation through cholinergic and adrenergic receptors.[25,26] Cigarette smoking increases the arterial stiffness, and increases the chances of atherogenesis, thrombo-embolism, ischemic cardiac disease and coronary crisis.[27,28] Serum bilirubin was found decreased in smokers this is consistent with previous studies.[29,30] It is known that the serum bilirubin is a natural plasma anti oxidant which is consumed by free radical stress as in cigarette smokers. Blood cholesterol was raised in smokers this is consistent with previous studies.[31,32]

The present study has certain limitations such as; first-cause effect relationship cannot be ascertained due to study design, second – different race and ethnicity and third- medical students are always exposed to mental stress, hence the findings should be cautiously interpreted for the general populations.

CONCLUSION

The present study reports high systemic blood pressure and serum cholesterol and low serum bilirubin in the smokers. Preventive strategies must be implemented to quit the smoking by youngsters.

Conflict of Interest: The study has no conflict of interest to declare by any author.

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