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## Some Cardio-pulmonary and Cardiovascular Assessments among Smokers and Non-Smokers Students of Ahmadu Bello University, Zaria, Nigeria

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### ABSTRACT

Tobacco smoking is arguably the most important preventable cause of cardiovascular disease. This present study was undertaken to determine some cardio-pulmonary and cardiovascular parameters effects among smokers and non-smokers students of Ahmadu Bello University, Zaria Nigeria. A total of 200 male students between the age ranges of 20-30 years were used in the study. 100 students were smokers (test group) and 100 students were non-smokers (control group). The results showed a significantly increase ( $p < 0.05$ ) systolic and diastolic blood pressure levels in smokers when compared to non smokers. There was also a significant decrease ( $p < 0.05$ ) peak expiratory flow rate of smokers when compared to non smokers. The mean values of pulse pressure in smokers, there was a significant increase ( $p > 0.05$ ) when compared to non smokers. In conclusion smoking increases the systolic and diastolic blood pressure and decrease the peak expiratory flow rate.

**Key words:** Nicotine, non-smokers, smokers, tobacco, blood pressure, peak expiratory flow rate

### INTRODUCTION

Tobacco smoke is a complex of over 500 compounds which vary with of tobacco and the way it is being smoked. The major pharmacologically active substances are nicotine and tars [1]. More than 2000 potentially noxious constituent have been identified in tobacco smokers, some in the gaseous phase and other in the particulate phase. Nicotine is an alkaloids present in the leaves of tobacco plant [2]. Nicotine acts as an adrenergic agonist, mediating local and systemic catecholamine release and possibly the release of vasopressin [3]. Paradoxically, several epidemiological studies have found that BP levels among cigarette smokers were the same as or lower than those of nonsmokers [4, 5]. There are number of cardiovascular disease are associated with smoking such as heart disease and peripheral vascular disease. It is estimated that around 13% of cardiovascular disease death are due to tobacco smoking [6]. The cardiovascular system is not directly exposed to the inhalation of cigarette smoke, but the ultimate adverse effects get to the heart due to the many autonomic effects of cigarette smoke and other proportions mostly nicotine [7]. Smoking is one of the major risk factors for heart attack. The risk of developing CHD increases with length and intensity of exposure to cigarette smoke. Among people less than 65 years of age, it is estimated that 36% of CHD in men and 33% in women is attributable to cigarette smoking. In all cases, risk increases with increased consumption cigarette smoke [8]. This research work was aimed at evaluating the effect of tobacco smoking on some cardiopulmonary parameters of male smokers and non- smokers subjects in Ahmadu Bello University, Zaria, Nigeria.

## MATERIALS AND METHODS

### Location and duration of the study

The study was carried out in Ahmadu Bello University, Zaria, Nigeria in the Month of August, 2012.

### Material Used

Cotton wool, Wright peak flow meter, sphygmomanometer, stethoscope and dettol solution

### Data collection method

A total number of 200 subjects were used for the study. 100 smokers (experimental group) and another 100 non-smokers (control group). All the subjects were Nigerian whose age ranges between 20 and 30 years. They were only male students of various Departments in Ahmadu Bello University Zaria, Nigeria. The data collected was facilitated by the use of questionnaires

### Determination of blood pressure

Briefly, the arm cuff of the digital blood pressure monitor was carefully wapped around the subject left arm just above the cubital fossa. The cuff was inflated by the machine to a certain pressure and the systolic and diastolic was read while the pulse pressure was calculated respectively.

### Determination of peak expiratory flow rate (PEFR)

A Wright peak flow meter was used. Briefly, the mouth of this apparatus was constantly disinfected with dettol before each use by the subject. The subjects took maximal inspiration and then give out a maximal expiration and the PEFR was read directly from the meter scale. A reset was made to return the pointer to zero and manoeuvre was repeated. The best of the three broadly reproducible attempts was taken as the PEFR

### Statistical analysis

Random sampling technique was used in this study. Data obtained were expressed as mean  $\pm$  SEM for both the control and the experimental group and statistical comparison of measured variables between the two groups were carried out using independent students' t- test and the difference among means calculated at a level of  $p < 0.05$  indicating significance [9] .

## RESULTS

Table 1 shows the mean values of cardiopulmonary parameters of control and experimental groups. The study showed a significantly decreased ( $p < 0.05$ ) peak expiratory flow rate in smokers when compared to non smokers. However, there was significantly increase ( $p < 0.05$ ) systolic and diastolic blood pressure levels in smokers than non smokers when compared. The mean values of pulse pressure and mean arterial blood pressure in smokers were significantly increased ( $p < 0.05$ ) when compared to non smokers.

**Table 1: Mean ( $\pm$  SEM) value of cardio-pulmonary parameters of subjects**

	Smokers	Non-smokers
Age (years)	24.66 $\pm$ 0.153	24.11 $\pm$ 0.219
Peak expiratory flow rate (L/min)	129 $\pm$ 0.532 <sup>a</sup>	423.0 $\pm$ 9.642
Systolic pressure (mmHg)	134.0 $\pm$ 1.727 <sup>a</sup>	119 $\pm$ 0.748
Diastolic pressure (mmHg)	88.23 $\pm$ 0.96 <sup>a</sup>	70.0 $\pm$ 0.61
Pulse pressure (mmHg)	44.59 $\pm$ 7.88 <sup>a</sup>	27.5 $\pm$ 0.733
Mean arterial blood pressure (mmHg)	96.95 $\pm$ 7.98 <sup>ns</sup>	88.95 $\pm$ 0.033

<sup>a</sup> $P < 0.05$  are statistically significant when compared to control group while ns= not significant

## DISCUSSION

A strong dose response relationship has been found to exist between cigarette smoke inhalation and elevated values of blood pressure both systolic and diastolic, heart rate, mean arterial blood pressure and pulse pressure. The present study reported a significantly elevated ( $p < 0.05$ ) systolic and diastolic blood pressure levels in smokers when compared to non smokers. This finding is in consonance with the work of [10] who reported increased in blood

pressure level with nicotine consumption. The pulse pressure and mean arterial blood pressure in smokers were significantly increased ( $p < 0.05$ ) when compared to non smokers. Nicotine an alkaloids present in the leaves of tobacco plant has been reported to contain a sympathomimetic chemical that promotes the release of catecholamines and other neurotransmitters that act centrally and peripherally to cause cardiovascular effects such as elevated heart rate, blood pressure and cardiac output[11]. The result showed that the peak expiratory flow rate was significantly less ( $p < 0.05$ ) in the cigarette smokers than in the non-smokers. This finding is consistent with the report of [12] who observed a reduced peak expiratory flow rate in smokers than nonsmokers.

### CONCLUSION

It can be concluded that smoking significantly increased the systolic and diastolic blood pressure in smokers than non-smokers. However, there was significantly decrease peak expiratory flow rate in smokers as compared to non-smokers.

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