



## EFFECT OF ACUTE STRESS ON CARDIOVASCULAR PARAMETERS IN YOUNG ADULT SMOKERS

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### ABSTRACT

*Introduction: Stress is major problem faced by young adults. Stress Induced headache is very commonly seen as immediate adverse effect of stress. In stressed environment, young adults try to get rid of stress by means of smoking.*

*Aim and objectives: to study the effect of acute stress on cardiovascular parameters in young adult smokers.*

*Material method: One hundred asymptomatic male smokers, aged 17-25 years, participated voluntarily in the present study. Cold pressor test (CPT) was used to produce acute stress. Blood pressure and heart rate were recorded by using automatic digital sphygmomanometer. All the parameters were recorded before CPT, immediately after CPT.*

*Results: Results showed that there was significant and more pronounced increase in cardiovascular parameters in smokers.*

*Conclusions: Smoking leads to sympathetic stimulation and shifts the sympatho-vagal balance towards sympathetic side. As a result of it smokers are hyper responsive to acute stress and more prone to develop cardiovascular disease like hypertension.*

**KEYWORDS :** Stress, Cold Pressor Test, sphygmomanometer, smokers

### INTRODUCTION

Stress is a major problem in the present scenario. Ability to cope up with stressor is declining in people. Prolonged stress or repeated stress also makes the people more prone for generation of hypertension<sup>1,2</sup>. Stressors stimulate sympathetic nervous system.<sup>3</sup> In an attempt to reduce stress young adults start smoking which is injurious to health but this tendency of smoking increases with increase in stress. However it deteriorates the overall health of people. Smoking also stimulates the sympathetic nervous system by its constituents like nicotine. Nicotine intake in other form like tobacco etc is also harmful for the body. Smoking has deleterious effects on various systems of body like respiratory system, cardiovascular system and nervous system etc. Chronic smoker have been found to be suffering from chronic obstructive pulmonary disease and other respiratory morbidities. Dyspnoea on exertion and chronic cough are the features which are commonly seen in chronic smokers. Smoking has been found to be associated with development of hypertension and increases the risk of cardiovascular diseases. Majority of studies have conducted to find out the harmful effects of smoking on cardiovascular and respiratory system on long term exposure. Smoking also has some effects on central nervous system and autonomic nervous system as well. Smoking has overall excitatory effect on the body. Therefore sympathetic tone in smoker must be higher even in resting state which is just opposite to that seen in trained athletes where resting vagal tone is higher.

As stress and smoking produce harmful effects on cardiovascular system therefore the present study aims to find out the effect of effect of acute stress on cardiovascular parameters in young adult smokers.

### MATERIAL AND METHODS

One hundred asymptomatic healthy male adults, aged 17-25 years, participated voluntarily in the present study, undertaken, to assess the effect of effect of acute stress on cardiovascular parameters in young adult smokers.

Procedures followed in the present study were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000 (5).

Subjects were divided in two groups of 50 each. Group A comprised of non smokers and group B comprised of smokers. Experiment procedures were in accordance with the ethical committee on human experimentation. Study was carried out at ambient temperature with minimal external or internal sound disturbances in the room. Subjects reported to laboratory 2 hours after light lunch. They were explained in detail about the experimental procedure. Informed consent was

taken from all subjects. Procedure was conducted in 2 steps. In first step, subjects were asked to lie in supine position and to take rest for 10 minutes. Systolic blood pressure (SBP), diastolic blood pressure (DBP) and heart rate (HR) were recorded by using automatic digital sphygmomanometer.

Subjects were asked to dip left hand in cold water at 8°C for two minutes. Above mentioned parameters were recorded again immediately after removal of hand from cold water.

All data were collected and statistical analysis was done by student t test using the window SPSS Statistics 17.0 version.

### ReSULT

**Table 1: Comparison of cardiovascular parameters before & after Cold Pressor Test (CPT) in both groups**

SN		Group A	Group B	
1	Systolic blood pressure	Before CPT	115.82±8.5	117.2±7.2
		Immediately after CPT	132.92±7.2	147.32±9.5*
2	Diastolic blood pressure	Before CPT	75.82±6.5	80.2±7.1
		Immediately after CPT	84.92±8.2	93.32±9.4*
3	Heart rate	Before CPT	71.82±5.3	74.2±5.4
		Immediately after CPT	82.92±6.7	97.32±2.8*

Data presented are Mean±SD. \*p<0.05

\*comparison between group A and group B

Table 1 show that there was no significant difference in systolic blood pressure, diastolic blood pressure and heart rate in group A and Group B. After exposure to cold stress, systolic blood pressure, diastolic blood pressure and heart rate increased significantly in both the groups but increase in all these parameters was more significantly higher in group B in comparison to group A (p<0.05).

### Conclusion

Stress increases sympathetic activity of autonomic nervous system and may produce hypertension. Cold stress produces intense stimulation of sympathetic nervous system<sup>9</sup>. Smoking increases sympathetic activity. Increased sympathetic activity is responsible for increase in blood pressure and heart rate.

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