

Original article

Application of valsalva ratio measures in assessing severity of impact of smoking in young healthy individuals

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Abstract:

Introduction: In India smoking is a common habit prevalent in both urban and rural area irrespective of the item smoked. About 17% smokers in the world live in India. Herewith present study was planned to study validity of application of valsalva ratio measures in assessing severity of impact of smoking in young healthy individuals.

Materials and Methods: The present work was carried out in department of Physiology, Rural Medical College, Pravara Institute of Medical Sciences, Loni. 100 male subjects in the age group 25 to 40 years comprising of 50 smokers and 50 nonsmokers as control group were selected for present study. Participant subjects were from staff members, residents and patients from routine OPD.

Results : After applying 'Z' test of difference between two sample means there is a highly significant difference between mean values of Para sympathetic function tests in the smokers and non-smokers group (i.e. $p < 0.01$)

Conclusion: Valsalva ratio underlined one of the most important parameter.

Introduction:

In India smoking is a common habit prevalent in both urban and rural area irrespective of the item smoked. About 17% smokers in the world live in India. ⁽¹⁾ Presently nearly 2200 people per day and 9 lacks every year die in India due to tobacco related diseases. The Health Ministry estimates that 40 % of India's health problems stem from tobacco use.⁽²⁾ The pressor and tachycardial effects of cigarette smoking are associated with an increase in plasma catecholamines , suggesting the dependence of these effects on adrenergic stimulation. Smoking is accompanied by a marked and prolonged increase in heart rate and blood pressure.⁽³⁾

Herewith present study was planned to study validity of application of valsalva ratio measures in www.apad.co.in/ Tayade MC et al.

assessing severity of impact of smoking in young healthy individuals.

Materials and Methods:

The present work was carried out in department of Physiology, Rural Medical College, Pravara Institute of Medical Sciences, Loni. It was part of our dissertation work; topic was presented by us and approved by Institutional Ethical and Research Committee.

Study Type: Cross sectional study.

Study Duration: 3 years

Sampling Technique: Purposive Sampling.

Statistical Methods: Percentages, Mean, Standard Deviation, Z test and t test of significance.

Materials used:

1. Can win Autonomic Analyzer Machine.
2. Clarity Medicare’s OCTOPUS: 2 Channel EMG Machine.
3. Handgrip Dynamometer.

Participant subjects:

100 male subjects in the age group **25 to 40 years** comprising of **50 smokers** and **50 nonsmokers** as control group were selected for present study. Participant subjects were from staff members, residents and patients from routine OPD.

Prior **informed written consent** was obtained after explaining the procedure and purpose of study tests.

Inclusion Criteria:

Case Group: Smokers with history of smoking for more than 5years with no history of any major illness like Hypertension, Diabetes Mellitus, and Peripheral Neuropathy in past or present were considered as case group for present study.

Control Group : Subjects who had never smoked in life and not having any other addiction related to

tobacco and with no history of any major illness like Hypertension ,Diabetes Mellitus ,Peripheral Neuropathy in past or present were considered as control group for present study.

Exclusion criteria:

Case Group: Smokers with history of smoking for less than 5years were excluded from present study. Subjects with history of any major illness like Hypertension, Diabetes Mellitus, and Peripheral Neuropathy in past or present were also excluded from present study.

Control Group: Subjects with any form of addiction were excluded from present study. Subjects with history of any major illness like Hypertension, Diabetes Mellitus, and Peripheral Neuropathy in past or present were excluded from present study.

The detailed personal history of the participants like type of diet, habits, addictions, occupation and past history was recorded.

Results:

Table No.1: Comparison of mean values of autonomic function tests in smokers and non-smokers (Para sympathetic function tests)

Para sympathetic function tests	Smokers (n=50)	Non-smokers (n=50)	Z test value	'p' value	Significance
	Mean ± SD	Mean ± SD			
Valsalva Ratio	2.87 ± 1.09	4.89 ± 1.24	8.66	p<0.01	Highly significant

After applying ‘Z’ test of difference between two sample means there is a highly significant difference between mean values of **Para sympathetic function tests** in the smokers and non-smokers group (i.e. p<0.01)

Table No. 2: Correlation of Smoking index and Para sympathetic function tests in Smokers:

Smoking Index	Valsalva Ratio
	Mean ± SD
1-100 (Light smokers) (n=31)	3.66±2.78
101- 200 (Moderate smokers) (n=11)	3.14±2.67
Above 200 (Heavy smokers) (n=8)	1.81±2.47

From the above table, it is seen that as far as para sympathetic function tests are concerned values of Valsalva ratio go on decreasing as the severity of smoking (smoking index) increases indicating greater damage to parasympathetic system.

Discussion:

Cardiovascular autonomic function tests were performed by using Canwin Autonomic Analyzer and nerve conduction velocities were measured by using Clarity Medicare’s Octopus two channel EMG machine. The observations and results were analyzed and interpreted by using various relevant tests of biostatistics like percentages, mean, range, standard deviation, Z test etc. To eliminate some of the factors influencing the cardiovascular autonomic function tests and nerve conduction velocity, nonsmokers were chosen from the same age group and almost same height, weight, body

mass index etc. thereby getting proper matching of smokers and nonsmokers.^{4,5,6}

Valsalva ratio is a reliable indicator of parasympathetic activity which is responsible for recovery of heart rate after strenuous activity like Valsalva maneuver. The manoeuvre creates a high intrathoracic pressure which evokes a complex circulatory response with four phases. Our study shows that smokers (4.89 + 1.24) have a lower value of Valsalva ratio compared to nonsmokers (2.87+1.09) indicating derangement of parasympathetic function. Other research workers G.A.Gould et al (1986)⁷, Mervi et al (1994)⁸ and Beatriz et al (2011)⁹ etc.also found similar results.

Conclusion:

Valsalva ratio underlined one of the most important parameter .

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