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Original Research Article.

To Assess the Correlation between Anthropometric Parameters and Cardiovascular Reactivity in Normotensive Students

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ABSTRACT

Background: High blood pressure is one of the most important risk factor for cardiovascular disease. CVD are the number one cause of death globally. The present study was conducted to assess the correlation between Anthropometric parameters and Cardiovascular reactivity in normotensive students.

Materials and Methods: This cross-sectional study was conducted among 100 MBBS students in the age group of 19 to 22 years at KD Medical College, Hospital and Research Centre, Mathura subjects over the period of 2 months were selected for the study. The subject will be asked to had a light breakfast then in the sitting position we will take the Cardiovascular parameters and Anthropometric data of the subject. This study will be significant if the calculated 'p' value is < 0.5. Data was analyzed using SPSS version 20. Correlation between Cardiovascular Reactivity and Anthropometric parameters will be accessed by Pearson's Correlation method.

Results: In the present study the mean age of the subjects was 21 years, mean height was 1.65, mean weight was 67.24 kg and mean BMI was 23.37. P value found to be statistically non-significant for BMI and heart rate, BMI and DBP, BMI and Transit time, BMI and Velocity. And P value found to be statistically significant for BMI and SBP, BMI and MAP.

Conclusion: Our findings in the study showed the existing positive correlation between the BMI and the various reactivity measures of the heart such as heart rate, systolic blood pressure, diastolic blood pressure, mean arterial pressure, pulse transit time and pulse velocity.

Keywords: Heart Rate, Systolic Blood Pressure, Diastolic Blood Pressure, Mean Arterial Pressure.

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INTRODUCTION

Obesity is one of today's most blatantly visible yet most neglected public health problems.[1] The epidemic of obesity is becoming a significant health issue in developing nations as well, compared to the popular belief that it is restricted to only industrialized countries.[2] Obesity is the major determinant of noncommunicable diseases such as diabetes mellitus, coronary heart disease, and stroke. India, standing second to China in population, contributes almost 16% to the world's death census.[3] Obesity is directly associated with hypertension as well as overall cardiovascular disease morbidity.[4] Cardiovascular reactivity (CVR) is an increase in heart rate and blood pressure when exposed to stress. Increased CVR to stress is an indicator of developing hypertension.[5] The present study was conducted to assess the correlation between Anthropometric parameters and Cardiovascular reactivity in normotensive students.

MATERIALS AND METHODS

This cross-sectional study was conducted among 100 MBBS students in the age group of 19 to 22 years at KD Medical College, Hospital and Research Centre, Mathura subjects over the period of 2 months were selected for the study. Before the commencement of the study ethical approval was taken from the Ethical Committee of the institute. The sample was selected by convenient sampling. The subjects who were normotensive, non-alcoholic, non-smoker were included in the study. The subjects who were hypertensive, diabetic, with no family history of CVD were excluded from the study. The subject has to report Physiology Department between 9am and 10 am with no intake of any caffeinated or carbonated drinks for at least 3hrs before the experiment. Complete procedure involved in the study will be explained to them in vernacular language. Written consent form

will be taken by them. The subject will be asked to have a light breakfast then in the sitting position we will take the Cardiovascular parameters and Anthropometric data of the subject. Anthropometric parameters such as age, sex, height (using a wall mount Stadiometer), body weight (in kilogram using weighing machine). Cardiovascular parameters such as Blood pressure (sphygmomanometer), Heart rate (polyoxymeter) and Pulse wave contour analysis using Polyrite which gave the Pulse transit time, Stiffness index, Reflection index. If any discomfort will be reported by the subject then he/she will be excluded from this study. This study will be significant if the calculated 'p' value is < 0.5. Data was analyzed using SPSS version 20. Correlation between Cardiovascular Reactivity and Anthropometric parameters will be accessed by Pearson's Correlation method. Variation of Cardiovascular Reactivity (Heart rate, blood pressure, pulse transit time) before, during and after playing mobile games will be accessed by Repeated Measure ANOVA. Comparison of Cardiovascular parameters on the 1st day and last day of study of a subject will be accessed by Paired T Test.

RESULTS

In the present study total subjects were 100 (both males and females). Table 1 shows that mean age of the subjects was 21 years, mean height was 1.65, mean weight was 67.24 kg and mean BMI was 23.37.

Table 2 shows the association between the BMI and the various cardiovascular reactivity parameters. P value found to be statistically non-significant for BMI and heart rate, BMI and DBP, BMI and Transit time, BMI and Velocity. And P value found to be statistically significant for BMI and SBP, BMI and MAP.

Table 1: Anthropometric details of the subjects

Parameter	Mean ± SD
Age (years)	21.07 ± 1.36
Height (m)	1.65 ± 0.107
Weight (kg)	67.24 ± 15.51
BMI (Kg/m2)	23.37 ± 3.76

Table 2: Association between BMI and the various cardiovascular reactivity parameters

	Pearson's correlation coefficient	p-value
BMI × HR	0.220	0.074
BMI × SBP	0.358	0.003*
BMI × DBP	0.230	0.061
BMI × MAP	0.305	0.012*
BMI × Transit time	0.258	0.038
BMI × Velocity	−0.031	0.809

Statistically significant $p < 0.05$

DISCUSSION

Cardiovascular adjustments are much required to cope up with both physical and psychological stress. Studies conducted earlier have found CVR to acute psychological stress as a subclinical risk for coronary vascular disease in young adults.[6,7] Reduced sympathetic and parasympathetic activities in children with obesity have been correlated to the increased body fat, which is considered to be an etiological factor for childhood obesity.[8]

In the present study the mean age of the subjects was 21 years, mean height was 1.65, mean weight was 67.24 kg and mean BMI was 23.37. P value found to be statistically non-significant for BMI and heart rate, BMI and DBP, BMI and Transit time, BMI and Velocity. And P value found to be statistically significant for BMI and SBP, BMI and MAP.

Lee et al evaluated 1,254 obese children aged 6-12 years old, showed a strong correlation among CC with SBP and DBP.[9]

Sarni et al did not find correlation between WC and SBP or DBP in a sample of 65 preschoolers of low socioeconomic status.[10]

The greater quantity of visceral fat may favor an increase in sympathetic activity mediated by the associated insulin resistance, besides potentializing the activity of the renin-angiotensin-aldosterone system due to the increased angiotensinogen secretion by visceral adipocytes, when compared to the subcutaneous fat.[11]

The visceral fat accumulation could also exert a mechanical effect, inducing renal compression and promoting arterial blood pressure exacerbation.[12]

CONCLUSION

Our findings in the study showed the existing positive correlation between the BMI and the various reactivity measures of the heart such as heart rate, systolic blood pressure, diastolic blood pressure, mean arterial pressure, pulse transit time and pulse velocity.

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