RESEARCH ARTICLE

ASSESSMENT AND COMPARISON OF PRE-HYPERTENSION AND ITS DETERMINANTS IN SECOND AND FINAL YEAR STUDENTS OF AIMS & RC, RAJSAMAND

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Manuscript Info	*Abstract*
……………………. 	………………………………………………… **Background:** Pre-hypertension is associated with an increased risk of the development of hypertension and subsequent cardiovascular disease and raises mortality risk. Pre-hypertension is emerging health problem in adolescents now a days. The aim of this study was to determine the prevalence of pre-hypertension, to explore the association between pre-hypertension and established cardiovascular risk factors and compare them among second year and final year students of AIMS & RC, Rajsamand. **Methods:** In this cross-sectional study a representative sample of 200 participants was selected using a Random sampling method. Pre-hypertension was observed among 73 out of Total 200 students, 31 from second year and 42 final year students, 40 for Boys and 33 for Girls. **Result:** The pre-hypertensive group had higher body mass index, higher percentage of smoking, ate more added salt and less physical activity than did the normotensive group. Prevalence of prehypertension was higher among final year students than second year students due to heavy study stress. **Conclusion:** Primary prevention strategies should concentrate on reducing overweight and obesity. Diet education should be given to overcome this problem. Stress is another major predictor in medical students so Medical authority should make some strategies to relieve stress in medical students.

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Introduction:-

The global burden of non-communicable diseases is emerging as a major public health challenge in the world. One thing is clear: "when it comes to NCDs, inaction is not an option." According to WHO, chronic disease is modern epidemic. 60% of all deaths and 47% of burden of diseases are due to non-communicable diseases; these figures are expected to rise to 73% and 60%, respectively, by 2025. Hypertension is a well-known risk factor for the development of CVD, heart attack, and stroke. Hypertension is responsible for 57% of stroke deaths and 24% of coronary heart disease deaths in India. Due to change in life style, environmental and Socio-demographic risk factors the prevalence of Pre-hypertension and hypertension is increasing constantly. Pre-hypertension is associated with an increased risk of the development of hypertension and subsequent cardiovascular disease and raises mortality risk. Persons with pre-hypertension have a greater risk of developing hypertension than do those with lower blood pressure levels. Pre-hypertension is also an emerging health problem in adults and adolescents now a day. Medical Students are more prone to be exposed with established cardiovascular risk factors.

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Aims:
The study was aimed to know the prevalence of Pre-hypertension and its determinants in Second year and Final year students of AIMS & RC, Rajsamand and compare them.

Objectives:-
1. To determine the prevalence of pre-hypertension
2. To explore the association between pre-hypertension and established cardiovascular risk factors
3. Compare those risk factors among a second year and final year students of AIMS & RC, Rajsamand

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Methodology:-
Sample Size: Prevalence of pre-hypertension was 34% in various studies among adolescents and adults. Sample size was calculated by the Following formula.

Sample Size (N) = $4pq/L^2$
Where, p = Prevalence of pre-hypertension=34%
q = 100-p = 66%
L = 20% of p = 6.8
So Sample size (N) = 4*34*66/46.51

The estimated sample size was 193. Sample size of 200 was decided.100 students from second year and 100 students from final year.

Study design:
In this cross-sectional study, Participants were selected using a Random sampling method. (Chit method)

Study Area:
AIMS & RC, Rajsamand

Study Population:
Second year and Final year students of AIMS & RC, Rajsamand.

Data collection:
All Students were interviewed with predesigned questionnaire.

Blood pressure was measured after the students had rested for at least 5 minutes and from right arm placed at the heart level. Two measurements were taken by a mercury sphygmomanometer with at least 5 minutes between successive measurements and lower one was recorded. According to the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and treatment of High Blood Pressure (JNC 7) in 2003, prehypertension is defined as blood pressure range with a systolic BP of 120–139 millimeters of mercury (mmHg) and/or a diastolic BP of 80–89 mmHg. Body weight was measured with light cloth and without shoes, a common weighing machine was used for that.

Height was measured to the nearest 0.5 cm, without shoes using a measuring tape

Body mass index (BMI) was calculated as weight (in kilograms) divided by height (in meters) squared.

Data Analysis:
Statistical analysis was performed using Microsoft excel and EPI INFO version 7 software.

Results:-
Pre-hypertension was observed among 73 (36.5%) out of 200 students, 34 (34%) from second year and 42 (42%) final year students while 5(5%) were hypertensive in second year and 8(8%) in final year.

Table 1:- Presence of different risk factors among Normotensive and Pre-hypertensive SECOND YEAR Students.

Risk Factors	Normotensive	Pre-hypertensive	P

	(61) (61%)	(34) (34%)	value
Family history of hypertension	11 (18.32%)	6 (17.64%)	0.9643
Stress Factor	10 (16.39%)	8 (23.52%)	0.3948
Male sex	37 (60.65%)	18 (52.94%)	0.4653
Excessive salt intake	30 (45.45%)	19 (55.88%	0.5307
Smoking	14 (21.21%)	9 (26.47%)	0.7014
Lack of physical activity	24 (36.36%)	16 (47.05%)	0.4653
Overweight/obese	32 (48.48%)	19 (55.88%)	0.7482

Table 1 showing different risk present among second year students of AIMS & RC.   Male sex, excessive salt intake and overweight and obese were major risk factors which were observed in second year students AIMS & RC, Rajsamand.

Table 2:- Presence of different risk factors among Normotensive and Pre-hypertensive FINAL YEAR Students.

Risk Factors	Normotensive (50) (50%)	Pre-hypertensive (42) (42%)	P value
Family history of hypertension	12 (24%)	10 (23.80%)	0.8301
Stress Factor	09 (18%)	17 (40.47%)	0.017
Male sex	27 (54%)	24 (57.14%)	0.7629
Excessive salt intake	21 (42%)	22 (52.38%)	0.3202
Smoking	11 (22%)	11 (26.19%)	0.6390
Lack of physical activity	19 (38%)	18 (42.85%)	0.6390
Overweight/obese	22 (44%)	26 (61.90%)	0.08

Table 2 Showing different risk present among final year students of AIMS & RC. Major risk factors which were observe in final year students were almost same as in second year students of AIMS & RC, Rajsamand

Table 3:- Association of Pre-hypertension with Stress.

Year	Total Pre-hypertensive Students	Pre-hypertensive Students With Stress
Second Year	34	8(23.52%)
Final Year	42	17(40.47%)

Second Year: chi squire value 0.401, df =1, P=0.52657 (P>0.05), Test is not significant.
Final Year: chi squire value 5.591, df =1, P=0.018059 (p<0.05), Test is significant.

Discussion:-
The pre-hypertensive group had higher body mass index, higher percentage of smoking, ate more added salt and less physical activity than did the normotensive group. (Table 1)

(Table 2) These findings are consonant with previous reports on risk factors in pre-hypertension for cardiovascular disease[8]. Prevalence of pre-hypertension was higher among final year students than second year students may be due to heavy study stress. Analysis showed that Stress is major risk factor to developing Pre-hypertension and also hypertension. (Table 3)

Analysis showed that obesity and overweight were the strongest predictors of pre-hypertension.

Conclusions:-
Overweight and obesity are major determinants of the high prevalence rate of pre-hypertension detected in students of AIMS & RC, Rajsamand. Therefore, primary prevention strategies should concentrate on reducing overweight and obesity. Diet education should be given to overcome this problem.

Stress is another major predictor in Final Year medical students so Medical authority should make some strategies to relieve stress in medical students.

The normotensive Group also having higher percentage of these risk factors so they are also prone to develop pre hypertension in future. so preventive step should take in Normotensive students like health education.

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