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RELATIONSHIP BETWEEN WAIST CIRCUMFERENCE AND BODY MASS INDEX OF HYPERTENSION IN NON-TEACHING STAFF OF GOVERNMENT AND PRIVATE SCHOOLS OF WARANGAL, A.P., INDIA

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ABSTRACT

Hypertension is a major public health problem world-wide and is one of the risk factors for coronary artery disease. The objective of the present study was to determine the relative role of abdominal fat accumulation on the relationship between excess body weight, and high blood pressure among men and women of non-teaching staff members of public school of Warangal. This study was performed in the department of pharmacy practice clinical research centers of MGM hospitals; Warangal in 2013. We had a study group which includes 150 subjects of non teaching staff members of government and private school of Warangal. There were 44 women and 106 men .At the point of entry into the study group of all the study subjects written informed consent from before stating of research work. Data were collected by trained Pharm D and M Pharmacy paramedical students. The exclusion criterion was the co-existence of any other serious elements. A total numbers of 32 subjects were found to be normotensive in which 25 (17%) were men and 7 (5%) were women. Overall 26 subjects were found to be pre-hypertensives whereas, 20 (13%) were men .A total number of 8 (5%) subject were found to be hypertensive of which 6(4%) men and 2 (1.3%) women. Our results highlighted that the waist circumference seems to have a strong association with the risk of hypertension, especially among men than women. In future studies should investigate lipid profile of study subjects to correlate hypertension management regardless of gender or age.

Key words: Hypertension, Non-teaching staff, Men and Women.

INTRODUCTION

In world-wide hypertension is a major public health problem and is one of the risk factors for coronary artery disease and cerebrovascular disease [1]. However, Indians are genetically susceptible to weight accumulation especially around the waist [2]. Overweight or obesity is the leading cause of type 2 diabetes, hypertension, osteoarthritis, various types of cancers in women like breast cancer and uterus cancer, menstrual disorder and infertility and many more diseases. Under nutrition and overweight/ obesity are both higher for women than men. Obesity can be general or central (abdominal).Many epidemiologic studies have shown that body Mass Index (BMI) which is a measure of general obesity, is a powerful predictor of type 2 diabetes. Waist circumference (WC) measures the central obesity [3] We examined the relationships between waist circumference , body mass

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index in a men and women population of the non-teaching staff members of school. Therefore the aim of the present study was to determine the relative role of abdominal fat accumulation on the relationship between excess body weight, and high blood pressure among men and women of non-teaching staff members.

MATERIALS AND METHODS

This study was performed in the department of pharmacy practice clinical research centers of MGM hospitals; Warangal in 2013. We had a study group which includes **150** subjects of non teaching staff of public and private school of Warangal. There were **44** women and **106** men .At the point of entry into the study group of all the study subjects written informed consent from before stating of research work. Data were collected by trained Pharm D and M Pharmacy Paramedical students. The exclusion criterion was the co-existence of any other serious elements. Hypertension was defined as systolic pressure of >140 mmHg and diastolic blood pressure of >90mmhg. Data of all the subjects examined was given to the health attendants at the individual persons.Those whose hypertension was out of control were asked to continue same medication .Newly diagnosed persons on those not controlled by treatment or not complying with the treatment were advised to consult the nearest government hospital.

BP MEASUREMENT

Blood pressure was measured in the manual sphygmomanometer of brand LIFELINE EXCEL (Calibrated 300mmHg). Blood pressure was measured after subject had rested for 10 minutes or more in quite environment without talking , moving or smoking .Three successive measurement were made to ensure that the resting blood pressure was stable and to accustom subject to the manual device. Upon completion of these measurement subjects was asked to stand up and waist circumference ,height and weight were collected. Height was measured in standing position without shoe by using tape meter while the shoulder was measured in normal position .Body mass index was calculated as weight in kg per height in squared meter. Those with a BMI of 25.0 - 29.9kg/m were consider as very obese [3].

STATISTICAL ANALYSIS

The results were reported as a mean ± standard deviation the statistical analysis was done by using graph pad prism 5.0. the result were evaluated by using the independence sample t-test and pearson's correlation coefficient test, statistical significance was considered at p value <0.05

RESULTS

The study subjects consist of 44women and 106men. The total participant of mean age and standard deviation 37.49± 11.79 of the study subjects. The baseline characteristics of the study subjects by gender are shown in (Table.1). The mean age of the women and men subjects among the non-teaching staff of different schools of telangana region, was found to be 36.55 ± 7.887 and 37.89 ± 13.08. However, waist circumferences of study subjects were found to be 32.48±4.422 and 23.78 ± 4.624. In addition to that BMI of the study objects were 24.33 ± 3.568 and 33.85 ± 3.821. A total numbers of 32 subjects were found to be normotensive in which 25 (17%) were men and 7 (5%) were women (Table.1). Overall 26 subjects were found to be pre-hypertensive's. whereas, 20 (13%) were men and 6 (4%) were women (Table.2). A total number of 8 (5%) subject were found to be hypertensive of which 6(4%) men and 2 (1.3%) women (Table.3).

Table 1. Description of blood pressure, age and waist circumference of Normotensive subjects by gender based Population

Blood Pressure (mmHg)	Mean		Standard deviation		Minimum		Maximum		Confidence interval		'P' value
Systolic (110-120)	M=55	F=25	M=55	F=25	M=55	=25	M=55	F=25	M=55	F=25	
WC	33.36	32	3.520	3.556	23	29	42	39	32.41-34.32	31-34	<0.0001
AGE	34.42	36	10.49	7.433	19	23	68	60	31.58-37.25	33-38	
BMI	23	24	3.821	3.07	14	19	35	30	22-24	23-25	
Diastolic (70-80)	M=49	F=31	M=49	F=31	M=49	F=31	M=49	F=31	M=49	F=31	
WC	34	32.19	3.786	4.20	23	25	42	42	33-35	31-34	<0.0001
AGE	36.39	36	11.68	7.109	18	22	68	50	33-40	33-38	
BMI	23.16	24.40	3.856	3.625	14.36	19	35.42	34	22-24	23-26	
Systolic/ Diastolic (120/80)	M=25	F=7	M=25	F=7	M=25	F=7	M=25	F=7	M=25	F=7	<0.0001
WC	33.4	34.14	3.897	2.545	23	32	42	39	32 – 35	32-36	
AGE	35.8	36.43	10.47	5.533	19	27	68	42	31 – 40	31-41	
BMI	23.73	26	4.156	2.750	60	22	35.42	30	22-25	24-29	

Table 2. Description of blood pressure, age and waist circumference of Pre-hypertensive subjects by gender based population

Blood Pressure (mmHg)	Mean	Standard deviation	Minimum	Maximum	Confidence Interval	'P' value
Systolic (122-140)	M=29 F=12	M=29 F=12	M=29 F=12	M=29 F=12	M=29 F=12	
WC	34 34	3.952	29 24	45	32.43-35.43 30-37	
AGE	41.48	5.692	23 27	42	36.24-46.72 33-42	
BMI	37.42	13.78 7	11.2 19	68	22.14-26.47 23-28	<0.0001
	24.31	5.69		50		
	25.33	3.781		41		
				31		
Diastolic (80-90)	M=42 F=11	M=42 F=12	M=42 F=31	M=29 F=12	M=29 F=31	
WC	34 32	.977	29 24	45	32.74-35.22 28.71-	
AGE	39 37	4.763	22 30	40	35.1 35-43	
BMI	24.40 24.27	12.86	11.20 19	68	31.17-43	<0.0001
		2.618		60	23-26 22-27	
		5.433		41		
		3.583		31		
Systolic/Diastolic 140/90	M=20 F=6	M=20 F=6	M=20 F=6	M=20 F=6	M=20 F=6	
WC	34 32.50	4.188 5.357	30 24	45 40	32-36 27-38	
AGE	41 33.38	13.14 2.422	25 32	68 36	35-47 31-36	
BMI	24.59 26.47	6.420 3.207	11 22	41 31	22-28 23-30	<0.0001

Table 3. Description of blood pressure, age and waist circumference of Hypertensive subjects by gender based population

Blood pressure	Mean	Standard deviation	Minimum	Maximum	Confidence interval	'P' value
Systolic (140-180mmHg)	M=19 F=2	M=19 F=2	M=19 F=2	M=19 F=2	M=19 F=2	
WC	34.68	4.407	29	44 39	33-37 -30-	0.093
AGE	34	7.07	29	77 45	97.53	___
BMI	44.58	16.37 0	25	41 34	37-52 45-	0.1248
	45	6.849	45		22	
	29.47	7.884	11.20		16-29 -43-	
	28		22.49		99	
Diastolic (90-110mm HG)	M=12 F=2	M=19 F=2	M= 19 F=31	M=19 F=2	M=29 F=31	
WC	34	3.881 6.364	29	44 42	33-35 28.71-	
AGE	37.50	19.21	33	77 50	35.1 35-43	0.2760
BMI	42.17	16.26	25	32 25	31.17-43	0.0078
	38.50	4.675	27		23-26 22-	0.1848
	25.24	0.4313	17.36		27	
	25		25			
Systolic/ Diastolic >140/100mmHg	M=6 F=2	M=6 F=2	M=6 F=2	M=6 F=2	M=6 F=2	
WC	35 34	5.193 7.07	31 29	44 39	29.38 – 40.28 -29	
AGE	44.83 45	21.04 0	28 45	77 45	- 97	
BMI	25 28.07	4.6841 7.884	19.56 22	32.21 34	23 - 67 --	
					----	
					20 - 30 -43	
					- 99	

DISCUSSSION

According to [4-5], age-related changes in the cardiovascular system are (a) arterial stiffening; (b) endothelial dysfunction, which promotes vasoconstriction; (c) elevated systolic blood pressure and increased pulse pressure; (d) increased left ventricular wall thickness; (e) reduced early diastolic filling of the ventricles; (f) impaired cardiac reserve; (g) alterations in heart rate rhythm; (h) prolonged cardiac action potential; and (i) a decline in renal function that contributes to improper maintenance of extracellular fluid volume and composition. These age-associated changes in cardiovascular function contribute to morbidity and mortality brought about by various disease states ((i.e., hypertension, atherosclerosis, heart failure, etc.). The above finding similar to our present study. Recent data show that waist circumference is adequately correlated with fat located in the abdominal region [6- 8], which in turn is associated with various health problems [9-10]. This measurement was recently identified as the best indicator for evaluating the risk of cardiovascular diseases in epidemiological studies [11-12]. However, there is still no consensus concerning the definition of cutoff points for abdominal adiposity to adequately identify the risk of cardiovascular diseases. The data presented in this study support and strengthen the validity of using WC to identify overweight and obesity, with the advantage of being a simple and easy measurement. Waist circumference sensitivity, specificity, and predictive values proved satisfactory for diagnosing overweight and obesity at the levels proposed in the literature. However, it is important to exercise caution in using these findings, since in a US population of white, black, and Hispanic women, the WC values corresponding to overweight and obesity varied considerably, ranging from 80 to 90cm which can lead to a major reduction in the precision of estimates [13](Okosun et al., 2000). In this study, WC, BMI, and AGE showed a positive correlation for men with blood pressure. It was interesting to note that WC showed a correlation contrast to that of BMI for women, while the no-correlation was confirming results from previous studies. The women with intermediate WC levels showed an no risk of CVD as compared to men with WC less than 80cm.

The association between BMI and hypertension has been observed in other cross- sectional studies in Brazil [14-15] Strong epidemiological evidence exists that overweight increases the risk of hypertension and CVD, independent of age or levels of plasma glucose and serum cholesterol. Obesity, particularly abdominal adiposity, has been found to promote insulin resistance, which is related to hypertension in a graded fashion [16]**.** The above findings are similar to present study.

Hypertension and ischemic heart disease are work-related diseases whose production is favoured by physical or neuropsychological strain. Occupational factors can cause or contribute to strain, adding to the non-occupational factors in determining the occurrence of cardiovascular disease. In our present study very few subjects of non-teaching staff's suffering from hypertension. Hence our present study is similar to the above study [17].

CONCLUSION

Our results highlighted that the waist circumference seems to have a strong association with the risk of hypertension, especially among men than women.. However, there still was an increase in BMI, AGE of systolic blood pressure in both sexes and in diastolic blood pressure increased in hypertensive women. In future studies should investigate lipid profile of study subjects to correlate hypertension management regardless of gender or age.

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REFERENCES

1. Tanne JH. Children should have blood pressure and cholesterol checked by age of 5. Br Med J. 325, 2002, 358.
2. Yajnik CS. Obesity epidemic in India: intrauterine origins? Proceedings of the Nutrition Society. 63, 2004, 387–96.
3. WHO prevention and management of the global epidemic of obesity. Report of the WHO consultation on obesity, WHO, Geneva.1998, (Technical report series, No.894).
4. Lakatta EG, Levy D. Arterial and cardiac imaging: major shareholders in cardiovascular disease enterprises. Part I: Aging arteries: A "set up" for vascular disease. Circulation. 107, 2003, 139–146.
5. Lakatta EG, Levy D. Arterial and cardiac imaging: major shareholders in cardiovascular disease enterprises. Part II: The aging heart in health: links to heart disease. Circulation. 107, 2003, 346–354.
6. Despres JP, Prud HD, Pouliot MC, Tremblay A & Bouchard C. Estimation of deep abdominal adipose tissue anthropometric measurements in men. American Journal of Clinical Nutrition. 54, 1991, 471-477.

7. Lemieux S, Prud HD, Bouchard C, Tremblay C & Despres JP. A single threshold value of waist girth identifies normalweight and overweight subjects with excess visceral adipose tissue. American Journal of Clinical Nutrition. 64, 1996, 685-693.
8. Pouliot MC, Despress J, Lemieux, S, Moorjani, S.et al. Waist circumference and abdominal sagittal diameter: Best simple anthropometric indexes of abdominal visceral adipose tissue accumulation and related cardiovascular risk in men and women. American Journal of Cardiology. 1994; 73:460-468.
9. Folson AR, Kushi LH, Anderson K E, Mink PJ et al., Associations of general abdominal obesity with multiple health outcomes in older women: The Iowa Women's Health Study. Archives of Internal Medicine. 160, 2000, 2117-2128.
10. Han TS, Feskens EJ, Lean ME & Seidell JC. Associations of body composition with type 2 diabetes mellitus. Diabetes in Medicine. 15, 1998, 129-135.
11. Molarius A & Seidell JC. Selection of anthropometric indicators for classification of abdominal fatness – A critical review. International Journal of Obesity. 22, 1998, 719-727.
12. Stamler R, Stamler J, Riedlinger WF, Algera G et al., Weight and blood pressure. Findings in hypertension screening of 1 million Americans. JAMA. 240, 1978, 1607–1610.
13. Okosun IS, Rotimini CN, Forrester TE, Frase H et al., Predictive value of abdominal obesity cut-off points for hypertension in Blacks from West African and Caribbean island nations. International Journal of Obesity. 24, 2000, 180-186.
14. Fuchs FD, Moreira LB, Moraes RS, Bredemeier M, Cardozo SC. Prevalence of systemic arterial hypertension and associated risk factors in the Porto Alegre metropolitan area. Population-based study. Arq Bras Cardiol. 63, 1994, 473-479.
15. Piccini RX, Victora CG. Systemic arterial hypertension in an urban area of southern Brazil: prevalence and risk factors. Rev Saude Publica. 28, 1994, 261-7.
16. Kannel WB. Risk stratification in hypertension: new insights from the Framingham study. Am J Hypertens. 13, 2000, 3S-10S.
17. Doina IG, Dorin IB. Work-related cardiovascular diseases: hypertension and ischemic heart disease – An overview. AMT. 2(1), 2013, 180.