

# Study of Body Mass Index (BMI) in Adult Hypertensive Patients in Rangpur, Bangladesh.

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# BACKGROUND

- Hypertension is now recognized globally as a major public health problem.
- Prevalence of hypertension among adults ranges from 18.2% to 54.5%.
- Globally, high blood pressure (BP) is estimated to cause 7.1 million deaths.
- Obesity and weight gain are strong independent risk factors for hypertension.

# CONT'D

- The relationship between BMI and BP has long been the subject of epidemiological research.
- The association between body mass and BP has been widely reported across populations in Asia, Latin America, United States and Canada.
- It has been estimated that 60% of hypertension are overweight.

- Obese Res 1996; 4: 221-228.

# AIM AND OBJECTIVES

- The relationship between BMI and hypertension is of particular interest to developing countries.
- There is limited information on the contribution of BMI to blood pressure in Bangladesh.
- The aim of this study was to examine the association of BMI in adult hypertensive patients.

# METHODS

- **Study Place:** *Hypertension and Research Centre,*  
Rangpur, Bangladesh
- **Study Period:** December'09 to January'2010.
- **Study design:** Cross-sectional descriptive study.
- **Population:** 435 randomly selected adult hypertensive patients

# CONT'D

- **Inclusion criteria:**

- The age range of 20-59 years.
- SBP  $\geq$ 140 mm Hg & DBP  $\geq$  90 mm Hg.
- Both sex.

- **Exclusion criteria:**

- Children and adolescent below 18 year,
- Pregnancy and
- Gross physical abnormality.

# OPERATIONAL DEFINITION

- The study populations were grouped into normal (BMI  $<25$  kg/m<sup>2</sup> and overweight and obese (BMI  $\geq 25$  kg/m<sup>2</sup>).
- BMI was calculated as weight in kilograms over height in meters squared.
- Hypertensive patients were grouped according to JNC-7, into stage-1 (defined as SBP 140-159 mm of Hg & DBP 90-99 mm Hg) and stage-2 (defined as SBP  $\geq 160$  mm of Hg & DBP  $\geq 100$  mm Hg).

# STATISTICAL ANALYSIS

- Statistical analysis was done by using SPSS for Windows version 12.
- We used Chi-square test for comparison of the key variables between groups.
- Odds of hypertension were estimated by cross tabulation of hypertension and overweight and obesity.



# RESULTS

Table-I

## Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20-29	13	3.0	3.0	3.0
	30-39	258	59.3	59.3	62.3
	40-59	164	37.7	37.7	100.0
	Total	435	100.0	100.0	

- Majority (59.3%) were found in between 30-39 years.

# RESULTS

Table-II

## Sex

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid male	366	84.1	84.1	84.1
female	69	15.9	15.9	100.0
Total	435	100.0	100.0	

- Among the study groups, Males were (84.1% )and females15.9%.

# RESULTS

Table-III

## Residence

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid urban	324	74.5	74.5	74.5
semiurban	73	16.8	16.8	91.3
rural	38	8.7	8.7	100.0
Total	435	100.0	100.0	

- Study group comprises, urban dwellers 74.5%, semi-urban 16.8% and rural 8.7%.

# RESULTS

Table-IV

## Occupation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	service	162	37.2	37.3	37.3
	business	94	21.6	21.7	59.0
	housewife	54	12.4	12.4	71.4
	student	107	24.6	24.7	96.1
	other	17	3.9	3.9	100.0
	Total		434	99.8	100.0
Missing	System	1	.2		
Total		435	100.0		

- Hypertension was found more common in service holder 37.2%.

# RESULTS

Table-V

## Physicalactivity

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid sedintary	303	69.7	69.7	69.7
moderate worker	121	27.8	27.8	97.5
heavy worker	11	2.5	2.5	100.0
Total	435	100.0	100.0	

- Hypertension more common in sedentary workers 27.8%,
- And least in (2.5%) heavy worker.

# RESULTS

Table-VI

## HOBP

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid known	215	49.4	49.4	49.4
unknown	220	50.6	50.6	100.0
Total	435	100.0	100.0	

- Of the study population 50.6% were unaware of their high blood pressure.

# RESULTS

Table-VII

## HTN

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Stage-1	230	52.9	52.9	52.9
	Stage-2	205	47.1	47.1	100.0
	Total	435	100.0	100.0	

- Among study population majority (52.9%) had stage-1 hypertension .

# RESULTS

Table-VIII

## BMI

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<25	200	46.0	46.0	46.0
	>25	235	54.0	54.0	100.0
	Total	435	100.0	100.0	

- Majority (54%) of hypertensive patients were overweight or obese (BMI  $\geq$  25kg/m<sup>2</sup>).



# CHI-SQUARE TEST

Table-IX

## Risk Estimate

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for BMI (<25 / >25)	1.466	1.003	2.143
For cohort HTN = Stage-1	1.196	1.002	1.427
For cohort HTN = Stage-2	.816	.665	1.001
N of Valid Cases	435		

•The risk of hypertension at BMI  $\geq 25$  kg/m<sup>2</sup> was significantly high.

(OR=1.466, 95% CI = 1.003-2.143; p<0.48).

# RESULTS

Table-X

## Correlations

			HTN	BMI
Spearman's rho	HTN	Correlation Coefficient	1.000	.095*
		Sig. (2-tailed)	.	.048
		N	435	435
	BMI	Correlation Coefficient	.095*	1.000
		Sig. (2-tailed)	.048	.
		N	435	435

\*. Correlation is significant at the 0.05 level (2-tailed).

- In this study, there was a positive and significant correlation between hypertension and overweight and obesity ( $P < 0.05$ ).

# DISCUSSION

- In this study, we examined the relationship between overweight and obesity (BMI) and hypertension on adult people.
- A significant positive correlation between overweight and obesity and hypertension was observed, although the correlation coefficients were weak (0.095)
- And the odds of hypertension with overweight and obesity (BMI  $\geq$  25 kg/m<sup>2</sup>) was significantly high (OR=1.466, 95% CI = 1.003-2.143,  $p < .05$ ).

# CONT'D

- In other studies, correlation coefficients between BMI and BP was found less than 0.30.
  - (*F Tesfaye et al. Association between BMI and BP in Africa and Asia. Journal of Human hypertension 2007; 21, 28-37.*)
- In another study, Correlation coefficients was found 0.362, and OR was 1.17, (95% CI=1.04-1.32).
  - (Ghosh J R et al. Comparative Evaluation of obesity measures: relationship with blood pressures and hypertension. Singapore Med J 2007; 48(3): 232-235.

# CONCLUSION

- Overweight and obesity (BMI) is significantly and positively associated with Hypertension.
- And there is increase risk of hypertension in young overweight and obese adult populations.
- Overweight and obesity should be properly address for the management of hypertension.

# Acknowledgements

- Financial and technical support for this study was made available by Hypertension and Research Centre, Rangpur.
- Study participants and doctors and students who helped in the study and data collection are greatly acknowledged.
- We would like to acknowledge Professor Dr. Md. Zakir Hossain and Prof. Laique Ahmed Khan for their valuable technical support during the analysis of the data.

**THANK YOU ALL**