Frequency and Risk Factors Stratification of Hypertension among the Rural Population of Bangladesh

Dr. Goutam Kumar Acherjya
Asst. Professor (Medicine)
Jashore Medical College
Jashore, Bangladesh

Disclosure

Nothing to disclose.

Conflict of Interest

The authors have no conflict of interests

Background

- Hypertension (HTN) is one of the most common non-communicable diseases (NCDs) of premature morbidity and mortality.[1]

- The global burden of hypertension was 31.1% of adults (1.39 billion) in 2010 which would be projected 60% of adults (1.56 billion) in 2025.[2]

- The overall prevalence of hypertension among the adult people in Bangladesh was reported 26.4% to 40.7%% in some recent surveys.[3,4,5]

Objectives

As there is scarcity of epidemiological data regarding hypertension among the rural people in the southern part of Bangladesh, the study has been designed to find out the frequency and risk factors stratification of hypertension among the rural people in Jashore, Bangladesh.

Methodology

- **Study design**   :Cross Sectional Type of Observational Study.
- **Place of study**   :Bagherpara & Keshabpur Upazila Health
                                Complex, Jashore, Bangladesh.
- **Study population**   :Patients above 18 years attending as outpatients
- **Study Period**   :National Hypertensive Week, 2019.
- **Sample size**   :1812 participants above 18 years.
- **Sampling method**   :Non-probability purposive sampling.
- **Institution Approval** :Civil Surgeon Office, Jashore, Bangladesh.

Selection criteria

Inclusion criteria:

The eligible patients above 18 years aged attended during national hypertension week, 2019 in Bagherpara and Keshobpur upazila (sub-district) health complex, Jashore, Bangladesh

Exclusion Criteria:

✓ Patients incapacitate to give written consent

✓ Mentally ill patients

✓ Chronic disabled patient

Analysis

- Preformed structured data collection sheets were used in every selected case.

- Informed written consent was taken from every subjects.

- Analysis carried out using SPSS version 23.

- Categorical data was grouped as % and numbers and mean with standard deviation measured from continuous data.

- 2020 International Society of Hypertension Global Hypertension Practice Guidelines had been demonstrated to classify hypertension.[6]

- Chi-square test. One-way analysis of variance (ANOVA) used to extract *p*-value and Logistic Regression Analysis employed to evaluate risk factors analysis among different groups.

Results

Frequency; n (%) of Hypertension Status				Total
Normo-tensive	High Normal BP	Grade I HTN	Grade II HTN	
1275 (70.4%)	163 (9.0%)	286 (15.8%)	88 (4.8%)	1812 (100.0)

Age Distribution

Age Distribution	Hypertensive Status				Total	P-value
	Normo-tensive	High Normal BP	Grade I HTN	Grade II HTN		
Age in years; mean±SD	40±16	45±17	49±15	51±15	42±16	<0.001[s]
Age Groups in years						
<30	348 (19.2)	29 (1.6)	27 (1.5)	3 (0.2)	407 (22.5)	
30-39	336 (18.5)	36 (2.0)	55 (3.0)	15 (0.8)	442 (24.4)	
40-49	231 (12.7)	31 (1.7)	55 (3.0)	22 (1.2)	339 (18.7)	<0.001[s]
50-59	166 (9.2)	26 (1.4)	66 (3.6)	22 (1.2)	280 (15.5)	
≥60	194 (9.2)	41 (2.3)	83 (4.6)	26 (1.4)	344 (19.0)	

Significant difference observed in age among different Hypertensive groups. Normotensive group were younger than hypertensive groups.

Age Distribution
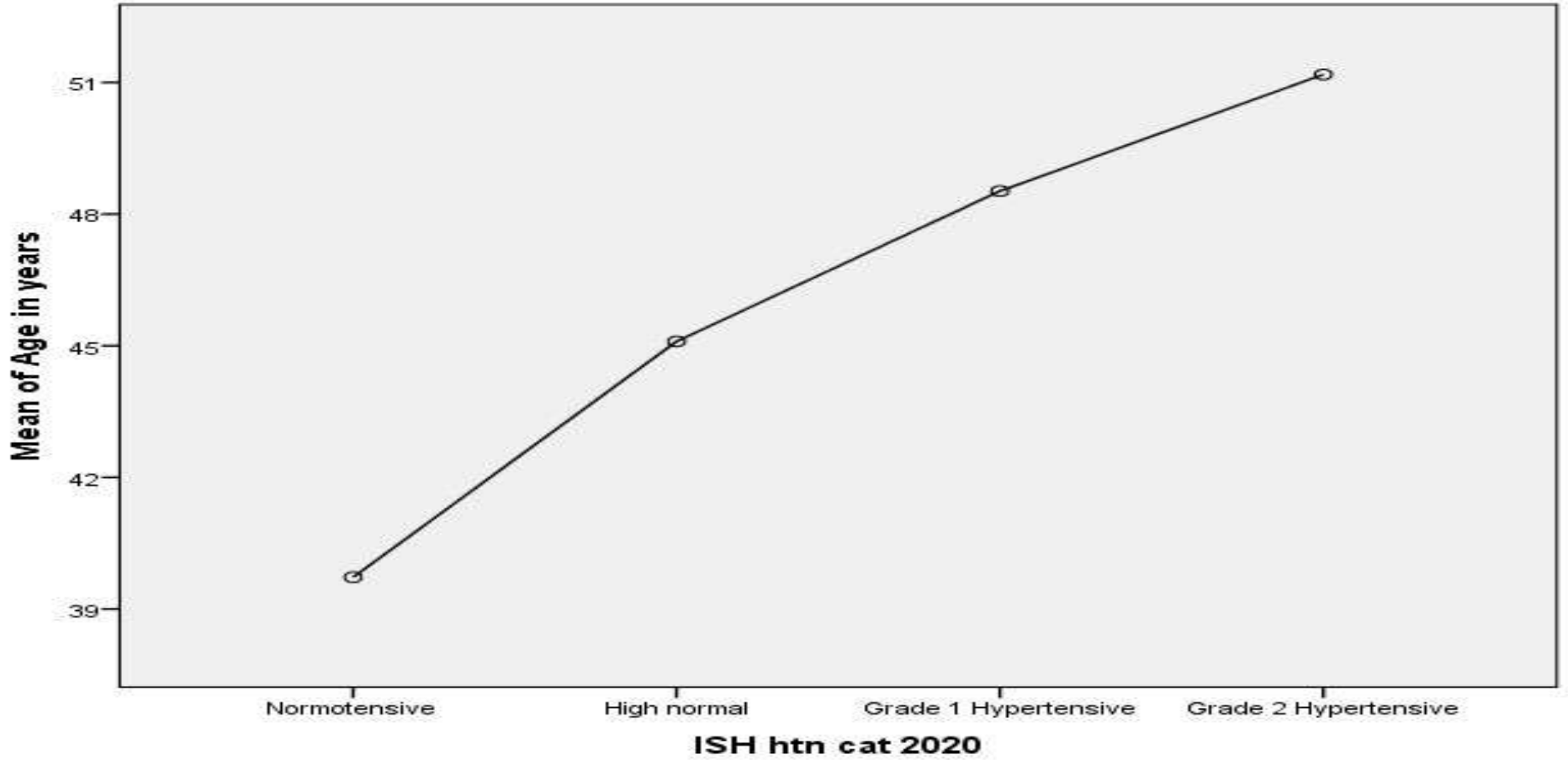
Gender distribution and BMI of study cases

Gender and BMI	Hypertensive Status				Total	P-value
	Normo-tensive	High Normal BP	Grade I HTN	Grade II HTN		
Gender; n (%)						
Female	882 (48.7)	96 (5.3)	173 (9.5)	56 (3.1)	1207 (66.6)	0.004[s]
Male	393 (21.7)	67 (3.7)	113 (6.2)	32 (1.8)	605 (33.4)	
BMI (Kg/m^2); mean±SD	22.1±3.8	23.2±3.6	23.9±4.2	23.7±4.2	22.6±3.9	<0.001[s]
BMI Category						
Underweight	212 (11.7)	15 (0.8)	29 (1.6)	10 (0.6)	266 (14.7)	
Normal	753 (41.6)	97 (5.4)	146 (8.1)	44 (2.4)	1040 (57.4)	<0.001[s]
Overweight	272 (15.0)	44 (2.4)	87 (4.8)	31 (1.7)	434 (24.0)	
Obese	38 (2.1)	7 (0.4)	24 (1.3)	3 (0.2)	72 (4.0)	

Significantly females were more hypertensive than male. Hypertensive subjects had significantly high BMI.

BMI
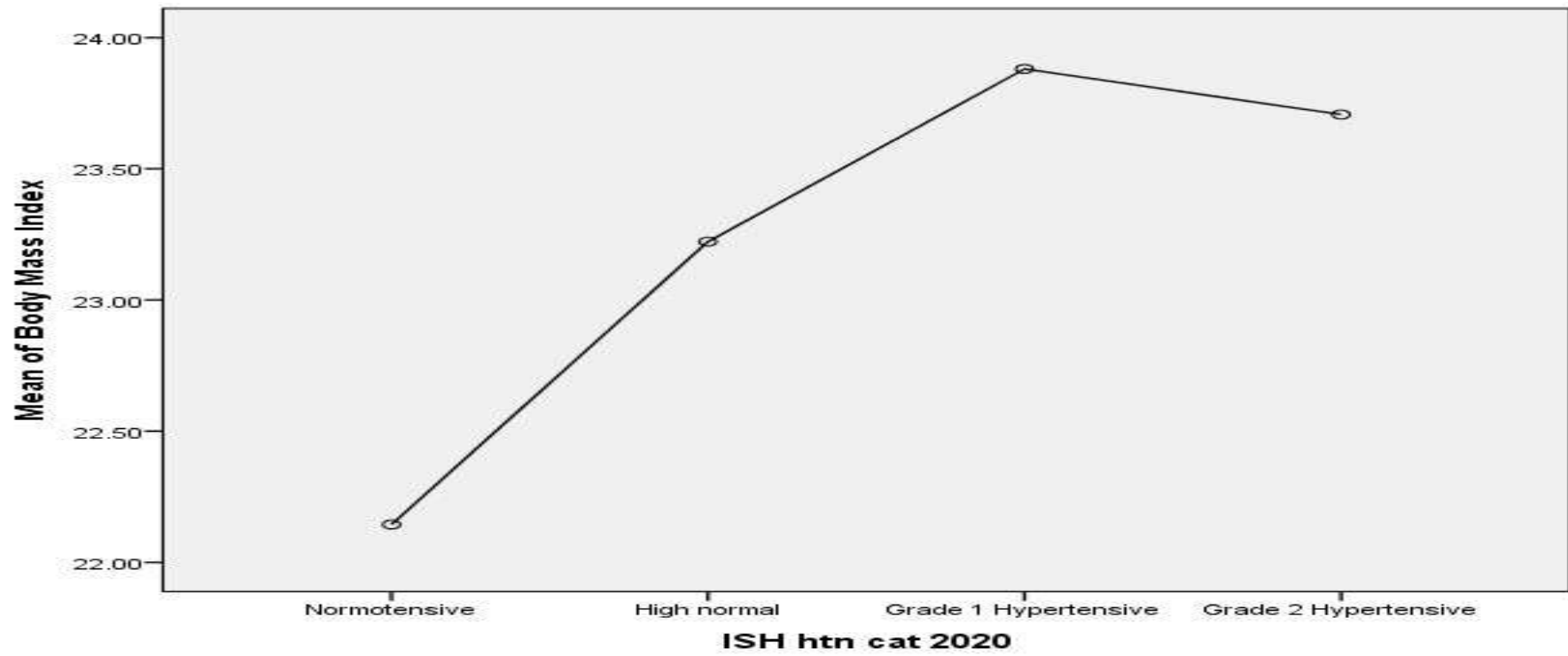
Occupation of study subjects

Occupation	Hypertensive Status				Total	P-value
	Normo-tensive	High Normal BP	Grade I HTN	Grade II HTN		
Student	96 (5.3)	6 (0.3)	6 (0.3)	0 (0.0)	108 (6.0)	
Housewife	748 (41.3)	83 (4.6)	161 (8.9)	51 (2.8)	1043 (57.6)	
Business	75 (4.1)	16 (0.9)	30 (1.7)	8 (0.4)	129 (7.1)	<0.001[s]
Service	156 (8.6)	24 (1.3)	27 (1.5)	12 (0.7)	219 (12.1)	
Farmer	200 (11.0)	34 (1.9)	62 (3.4)	17 (0.9)	313 (17.3)	

Housewife group had significantly high incidence of hypertension.

Risk factors

Risk factors	Hypertensive Status				Total	P-value
	Normo-tensive	High Normal BP	Grade I HTN	Grade II HTN		
Positive family H/O hypertension; n (%)	421 (23.2)	72 (4.0)	123 (6.8)	46 (2.5)	662 (36.5)	<0.001[s]
Positive past H/O hypertension; n (%)	178 (9.8)	51 (2.8)	144 (7.9)	51 (2.8)	424 (23.4)	<0.001[s]
Diabetes Mellitus; n (%)	109 (6.0)	23 (1.3)	56 (3.1)	16 (0.9)	204 (11.3)	<0.001[s]
Physical inactivity; n (%)	156 (8.6)	27 (1.5)	48 (2.6)	21 (1.2)	252 (13.9)	0.004[s]
Additional salt in food; n (%)	1063 (58.7)	121 (6.7)	184 (10.2)	58 (3.2)	1426 (78.7)	<0.001[s]
Smoking History						
Smoker	158 (8.7)	28 (1.5)	35 (1.9)	14 (0.8)	235 (13.0)	0.011[s]
Non-smoker	1024 (56.5)	113 (6.2)	217 (12.0)	67 (3.7)	1421 (78.4)	
Ex-smoker	93 (5.1)	22 (1.2)	34 (1.9)	7 (0.4)	156 (8.6)	

Logistic Regression Analysis of Risk Factors

Hypertensive subjects	β	Std. Error	df	Sig.	Exp(β)/OR	95% Confidence Interval	
						Lower Bound	Upper Bound
Intercept	1.564	.391	1	.000			
<30	-.805	.214	1	.000	.447	.294	.680
30-39	-.635	.181	1	.000	.530	.372	.755
40-49	-.392	.180	1	.029	.675	.475	.961
50-59	-.134	.180	1	.459	.875	.614	1.246
≥60	0[b]	.	0	.	.	.	.
Female	-.364	.241	1	.130	.695	.434	1.114
Male	0[b]	.	0	.	.	.	.
Current Smoker	.152	.232	1	.512	1.165	.739	1.837
Ex- smoker	.229	.241	1	.342	1.257	.784	2.015
Non-smoker	0[b]	.	0	.	.	.	.

Logistic Regression Analysis of Risk Factors

Hypertensive subjects	β	Std. Error	df	Sig.	Exp(β)/ OR	95% Confidence Interval	
						Lower Bound	Upper Bound
No Family history of Hypertension	-.232	.120	1	.052	.793	.627	1.002
Positive Family history of Hypertension	0[b]	.	0	.	.	.	.
No Past History of Hypertension	-1.223	.135	1	.000	.294	.226	.383
Past History of Hypertension	0[b]	.	0	.	.	.	.
Non-Diabetic	-.258	.186	1	.165	.773	.536	1.112
Diabetic	0[b]	.	0	.	.	.	.
Don't do regular physical activity for at least 30 minutes daily	.072	.174	1	.677	1.075	.765	1.511
Do regular physical activity for at least 30 minutes daily	0[b]	.	0	.	.	.	.

Logistic Regression Analysis of Risk Factors

Hypertensive subjects	β	Std. Error	df	Sig.	Exp(β)/OR	95% Confidence Interval Lower Bound	Upper Bound
No additional salt in food	.552	.135	1	.000	1.737	1.334	2.262
Additional salt in food	0[b]	.	0	.	.	.	.
Farmer	-.522	.380	1	.170	.593	.282	1.250
House wife	-.105	.236	1	.656	.900	.567	1.430
Businessman	.046	.238	1	.846	1.047	.657	1.670
Service	-.278	.213	1	.191	.757	.499	1.149
Student	0[b]	.	0	.	.	.	.
Underweight	-1.187	.312	1	.000	.305	.166	.562
Obese	-.860	.270	1	.001	.423	.249	.718
Overweight	-.497	.279	1	.076	.609	.352	1.052
Normal	0[b]	.	0	.	.	.	.

Limitation of this study

- This is a cross-sectional type of observational study in small area.
- Biochemical variables have not been estimated here.

Take Home Messages

- High frequency of hypertension have been found among the rural population

- Age, sex, BMI, occupation, positive family, diabetes mellitus, physical inactivity, additional salt and smoking are the significant risk factors of hypertension in our study.

- Policy makers should pay attention to the rural population.

- We also recommend a larger scale nationwide study of hypertension in Bangladesh.

References

1. C. Erem, A. Hacihasanoglu, M. Kocak, O. Deger, and M. Topbas, "Prevalence of prehypertension and hypertension and associated risk factors among Turkish adults: trabzon hypertension study," Journal of Public Health.2009;31(1):47-58.

2. Kearney PM, Whelton M, Reynold K, Muntner P, Whelton PK, He J. Global burden of hypertension: analysis of worldwide data. Lancet. 2005;365(9455):217-223.

3. Khanam F, Hossain MB, Mistry SK, Afsana K, Rahman M. Prevalence and Risk Factors of Cardiovascular Diseases among Bangladeshi Adult: Finding from a Cross-sectional Study. 2019;9(3):176-184.

4. Islam JY, Zaman MM, Haq SA, Ahmed S, Al- Quadir Z . Epidemiology of Hypertension among Bangladesh adults using the 2017 ACC/AHA Hypertension Clinical Practice Guidelines. J Hum Hypertens. 2018;32:668-680.

5. Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL Jr, Jones DW, Materson BJ, Oparil S, Wright JT Jr, Roccella EJ: The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC 7 report. JAMA 2003, 289:2560–2572

6. Unger T, Borghi C, Charchar F, Khan NA, Poulter NR, Prabhakaran D, et al. 2020 International society of hypertension global hypertension practice guideliines. Hypertension. 2020;75(6):1334-57.2020

Dr. Mohammad Ali, Assoc. Professor & Head (Haematology),
National Institute of Cancer Research and Hospital
Dhaka, Bangladesh.

thank you