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Psychosocial Correlates of Hypertension - A Comparative Study

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Abstract: ***Background: Hypertension is still a global burden and yet to be understood in elaborate because of the multiple causations that lead to it. There are many factors that contribute in its development and progress over time out of which psycho - social factors seem to play a very crucial role. Keeping this in mind, a comparative study and elaborate analysis is done in a tertiary care hospital of a West Bengal to understand the link between these factors and Hypertension. Materials &Methods: After taking a Informed consent from the patient they were allowed to participate and were taken through a Standard set of Questionnaire containing Anthropometric and physical assessment at its beginning followed by questions related to various psychosocial parameters. A total of 96 participants participated both in the controls and the case group (n=96). Risk factor is then determined by Chi square tests & student t test and Manu U whitney test as necessary. A p value of < 0.05 is considered statistically significant. Results: Multiple psychosocial and anthropometric parameters have yet again shown to have a very strong correlation with Hypertension. Detailed discussion and the report is given in the journal to follow. Conclusion: Multiple Factors encompass the causation of hypertension. After doing a comparative analysis multiple factors shown a positive correlation with the hypertension. Sedentary lifestyle and addiction showed to have a significant correlation with the hypertension. Furthermore specific personality types had positive correlation with the hypertension. Further studies are warranted to confirm the pathology behind this correlation and it's validity for application of data onto a larger scale as a whole.***

Keywords: Correlates, Hypertension, Factors, Comparative Study

1. Introduction

The etiology of hypertension remains poorly understood. According to the World Health Organization (WHO) [1], non - transmissible diseases will be the leading cause of functional disability in the next two decades and among chronic degenerative conditions, arterial hypertension will be the most important cause. Hypertension (HTN) is a public health concern due to its magnitude, risks, difficulty in management, high medical and social costs and severe cardiovascular and renal complications [2]. The number of deaths due to HTN as primary cause was estimated to be over 7.5 million in 2008, approximately 13% of all reported deaths [1]. Hypertensive adults will reach 1.5 billion by 2025, around 30% of the world population [3]. Genetic and behavioral factors known to be contributing in the etiopathogenesis of HTN leave a substantial portion of variability in outcome unexplained. HTN is the single most important factor driving the high rates of CVD related mortality and health care expenditures [4]. While research shows that HTN management is improving, [5] we still lack a comprehensive understanding of the factors that contribute to the disease onset. It is now well - established that the total variability in the etiology of HTN cannot solely be explained by physiological, genetic, and lifestyle factors. Few evidence supports the role of psychosocial factors like stress, depression, isolation & sleep as primary risk factors for HTN [6–8]. As a result, national HTN guidelines recommend psychosocial intervention as a means to prevent or delay the onset of HTN [9 - 11], Therefore, the aim of this research is to find out the psychosocial correlates of HTN.

2. Methodology

Type of study: It is a cross sectional study

Sample size: Subjects to be included in this study will be divided into two different groups: 120 normotensive and 120 known hypertensive patients will be selected. A duly filled in written consent form will be taken from all the subjects in their own mother tongue before including them in this study.

Subject recruitment procedures:
Consecutive hypertensive subjects (male & female), aged 20 - 55 years, attending the Medicine outpatient department, College of Medicine & JNM Hospital, WBUHS, Kalyani, W. B. will be included in the study.

Normotensive subjects (Control Group):
The control group will consist of 120 healthy normotensive men or women without any renal, cardiac, or vascular diseases. The cut off arterial blood pressure measurements in the control group will be≤135/85mmHg (Systolic blood pressure 135mmHg and diastolic blood pressure 85mmHg).

Hypertensive patients:
One hundred and twenty newly diagnosed hypertensive subjectswill be selected based on the criteria of Joint National Committee 7. A blood pressure of ≥ 140/90 mm Hg (Systolic blood pressure ≥ 140mmHg and diastolic blood pressure ≥ 90 mmHg) on two occasions at least 5 minutes apart will be the cut off value to be labeled as hypertensive.

Inclusion criteria:

1) Newly diagnosed hypertensive subjects attending the Medicine outpatient department, College of Medicine & JNM Hospital, WBUHS, Kalyani, W. B.
   a) 'Hypertensives' will be defined as having blood pressure of ≥ 140/90 mmHg on two occasions and measured 5 minutes apart.
   b) 'Normal healthy' subjects will be selected from the willing undergraduate students of College of Medicine with a blood pressure of ≤135/85 mmHg
2) Both gender
3) Age: 20 - 55 years

Exclusion criteria:

1) Subjects having diabetes, major heart disease requiring separate medications other than anti - hypertensives such as myocardial infarction, cerebrovascular accidents
2) Other major chronic illness such as asthma, degenerative joint diseases, immunological diseases, malignancy
3) Pregnancy

Data Collection Tools

The flowing instruments will be administered in succession: socio - demographic proforma specifically designed for purpose of this study; self designed lifestyle pattern proforma; Presumptive Stressful Life Events Scale (PSLES), Depression, Anxiety and Stress Scales (DASS - 21), paper - pencil version of the questionnaire of the Drug Abuse Screening Test (DAST - 10); International Personality Disorder Examination Screening Questionnaire (IPDE)

Data Collection Technique

Data will be collected by face to face interview which will last for approximately 45 minutes

Detailed plans for Statistical analysis:

1) Descriptive analysis willbe computed in terms of mean and standard deviation with range for continuous variables and frequency with percentage for ordinal and nominal variables.
2) Comparative analysis: For continuous variables comparison will be done using Independent Samples T - test and for categorical variables Pearson Chi - squared test with Yates' correction or Fisher's exact test will be used.
3) Correlation analysis: Correlations between the variables willbe assessed using Pearson's product moment and Spearman's rank order correlation.
4) Multivariate (Regression) Analysis: To study the effect of various independent variables on HTN, linear regression (enter method) will be used. The statistical model uses the minimum probability of F (significance level <0.05) as cut - off for entry. The F - value is the Mean Square Regression divided by the Mean Square Residual and indicates whether independent variables reliably predict the dependent variable. Variables which do not fulfill this cut - off will not be considered to be reliable predictors of the dependent variable in the statistical model and will not be entered for further analysis

3. Result

96 Hypertensives taken as Case group (n=96) and 96 Normotensives taken as control group (n=96) participated in the study and went through a detailed interview after giving their informed consent for the same.

Mean age in cases were 57.3±11.9 yrs and 19.89±2.1 yrs in controls. Out of these 55 were female and 41 male in cases whereas 48 were female and 48 male in the control group.92 had a high school education and 4 were post graduate in controls in comparisons to which 55 were illiterate, 17 having a mid - school education, 14 primary school education and 14 with the education of secondary level and above in cases. Most of them were unemployed (92%) and had a family income of >19575 (n=96) in controls. However in cases 57 were unemployed and had a income of <979 (**TABLE 1)**

Table 1**:** Sociodemographic details of Cases and control

Variable	Categories	Case (N=96) %	Control (N=96) %	P value (by chi square test)
Age (Years)	<30	2 (2.2)	91 (97.8)	<0.001*
	31 - 45	17 (100)	0	
	46 - 60	45 (100)	0	
	>60	32 (86.5)	5 (13.5)	
Mean (SD) age in years		57.3 (11.9)	19.89 (2.1)	<0.001*
Gender	Female	55 (53.4)	48 (46.6)	0.3
	Male	41 (46.1)	48 (53.9)	
Education	Professional	1 (100)	0	<0.001*
	Postgrad/graduate	1 ()	4 ()	
	Senior secondary	1 (100)	0	
	High school	7 (7.1)	92 (92.9)	
	Middle school	17 (100)	0	
	Primary schooling	14 (100)	0	
	illiterate	55 (100)	0	
Occupation	Professional	1 (100)	0	<0.001*
	Semi professional	1 (100)	0	
	Skilled	11 (100)	0	
	Semi skilled	8 (100)	0	
	Unskilled	18 (100)	0	
	unemployed	57 (37.3)	96 (62.7)	
Family Income	>19575	14 (12.7)	96 (87.3)	<0.001*
	9788 - 19574	4 (100)	0	
	7323 - 9797	3 (100)	0	
	4894 - 7322	6 (100)	0	
	2936 - 4893	7 (100)	0	
	980 - 2935	5 (100)	0	
	<979	57 (100)	0	

Family Type	Nuclear	55 (37.5)	92 (62.5)	<0.001*
	Joint	41 (91.1)	4 (8.9)	
Religion	Hindu	86 (47.8)	94 (52.2)	0.01*
	Muslim	10 (83.3)	2 (16.7)	
*P <0.05 Is significant				

Mean height, weight and BMI were 150.8±86, 55.44±10 & 24.4±4.6 in cases respectively and 163±10.8, 59.9±10.9 & 22.6±4.4 in controls respectively.33 % in cases had a family history of hypertension whereas 4% in controls had the same. History of obesity and dyslipidaemia were present in 22% of cases whereas in 1% of controls. Median age of onset of HTN in cases (years) was 51 (OR - 45 - 60) & Median duration of HTN in cases (years) was 4 (IQR - 1 - 8). (**TABLE 2, 3&4)**

Table 2: Anthropometrics variables of cases or controls

Variables	Mean (SD)		P Value (by students t test)
	Case	Control	
Height (cm)	150.8 (8.6)	163 (10.8)	<0.001*
Weight (Kg)	55.44 (10.3)	59.9 (10.9)	0.004*
BMI (Kg/m^2)	24.4 (4.6)	22.6 (4.4)	0.007*
Waist circumference (cm)	90.5 (12.7)	91 (11.18)	0.764
*P <0.05 is significant			

Table 3: Family History of cases and controls (N=96 each)

	Case (N, %)	Control (N, %)	P value (by chi square test)
Hypertension	33 (89.1)	4 (10.9)	<0.001*
Obesity, Dyslipidemia	22 (95.6)	1 (4.4)	<0.001*
*P<0.05 is significant			

Table 4: Median agebif onset

BP	Mean (SD)		P value (by students t test)
	Case	Control	
SBP	144.74 (19.9)	118.9 (9.1)	<0.001
DBP	86.35 (10)	77 (6.9)	<0.001

Mean BP was 144.74/86.35 in cases & 118.9/77 in the controls.94% in cases had a sedentary lifestyle of living whereas 44% had sedentary along with 52% had a active lifestyle amongst the cases.35 reported to have used excess salt in diet amongst cases while 11 did the same in the controls.24 had a history of smoking (active or passive) and 1 in controls and cases respectively. (**TABLE 4 & 5)**

Table 5: Lifestyle among cases and controls (N=96 each)

Variables		Case (%)	Control (%)	P Value (by chi square test)
Daily Lifestyle	Sedentary	94 (68.1)	44 (31.9)	<0.001*
	Active	2 (3.7)	52 (96.2)	
Diet	Vegetarian	11 (34.2)	21 (65.6)	0.05
	Non vegetarian	85 (53.1)	75 (46.8)	
Use of Excessive Salt		35 (76)	11 (24)	<0.001*
Alcohol use		1 (50)	1 (50)	1
Smoking		24 (96)	1 (4)	<0.001*
*P <0.05 is significant				

On DASS 21 SCALE, Depression had a median score of 10 (IQR - 7 - 12) & 4 (IQR - 2 - 6.5) in cases and control respectively. Anxiety had a score of 9 (IQR - 6 - 12) & 4.5 (IQR - 2 - 6.75) in cases and controls respectively. Stress scored 10 (IQR - 8 - 13) 7 6 (IQR - 4 - 8) in cases and controls respectively. Further categorization of these was done into normal, Mild, moderate, severe and extremely severe. (**TABLE 6 & 7)**

Table 6: Median DASS 21 Scoring of Cases and Control

DASS Categories	Range	Case	Control	P Value (by Mann whitney U test)
Depression	0 - 21	10 (IQR: 7 - 12)	4 (IQR: 2 - 6.5)	<0.001*
Anxiety	0 - 21	9 (IQR: 6 - 12)	4.5 (IQR: 2 - 6.75)	<0.001*
Stress	0 - 21	10 (IQR: 8 - 13)	6 (IQR: 4 - 8)	<0.001*
*P<0.05 is significant				

Table 7: DASS 21 Categories and severity among cases and controls (N=96 each)

DASS Categories	Severity	Case (%)	Control (%)	P value (by Chi square test)
Depression	Normal	13 (17.1)	63 (82.9)	<0.001*
	Mild	7 (20.4)	16 (69.6)	
	Moderate	32 (80)	8 (20)	
	Severe	29 (82.9)	6 (17.1)	
	Extremely Severe	15 (83.3)	3 (16.7)	
Anxiety	Normal	7 (14.6)	41 (85.4)	<0.001*
	Mild	6 (24)	19 (76)	
	Moderate	21 (48.8)	22 (51.2)	
	Severe	20 (42)	6 (8)	
	Extremely Severe	42 (84)	8 (16)	
Stress	Normal	22 (27.2)	59 (72.8)	<0.001**
	Mild	17 (56.7)	13 (43.3)	
	Moderate	28 (58.3)	20 (41.7)	
	Severe	23 (92)	2 (8)	
	Extremely Severe	6 (75)	2 (25)	

** Fischer's exact test
*P<0.05 is significant

8 (8.3%) cases had history of using other substance of abuse. Neither cases nor controls had history of STI.23 (23.95%) Cases had history of jaundice. Neither cases nor controls had ever been screened for HIV. Only 1 (1.2%) case was hospitalized in past for drug abuse.

On A personality scale paranoids were 70 (49.3%) in cases and 72 (50.7%) in controls. Schizoid were 90 (53.3%) in cases and 79 (46.7%) in controls. Dissocial were 35 (74.5%) in cases and 12 (25.5%) in controls. Impulsive were 27 (34.3%) in cases and 51 (65.4%) in controls. Borderline were 55 (70.5%) in cases and 23 (29.5%) in controls. Histrionic were 49 (57%) in cases and 37 (43%) in controls. Anakastic were 78 (57.4%) in cases and 58 (42.6%) in controls. Anxious were 74 (49%) in cases and 77 (51%) in

controls. Dependant were 71 (53.8%) in cases and 61 (46.2%) in controls (**TABLE 8)**

Table 8: Personality types in Cases and Controls (N=96 Each)

Personality type	Case (%)	Control (%)	P value (chi square test)
Paranoid	70 (49.3)	72 (50.7)	0.7
Schizoid	90 (53.3)	79 (46.7)	0.01*
Dissocial	35 (74.5)	12 (25.5)	<0.001*
Impulsive	27 (34.6)	51 (65.4)	<0.001*
Borderline	55 (70.5)	23 (29.5)	<0.001*
Histrionic	49 (57)	37 (43)	0.08
Anakastic	78 (57.4)	58 (42.6)	0.001*
Anxious	74 (49)	77 (51)	0.5
Dependent	71 (53.8)	61 (46.2)	0.1
*P<0.05 is significant			

A Univariate and multivariate logistic regression model for predictors for Hypertension were done further
.

Table 9: Univariate and Multivariable Logistic regression model for predictors of Hypertension (Case)

Predictors	Univariate Analysis	Multivariable Logistic Regression	
	Odds ratio (95% CI) /OR	Adjusted Odds (95% CI) /AOR	P value
Family history of HTN	12.05 (4.1 - 35.7)	0.25 (0.003 - 0.224)	0.001*
BMI (continuous)	-	1.17 (1.03 - 1.318)	0.01*
Lifestyle	0.018 (0.004 - 0.077)	176.4 (11.9 - 2596.3)	<0.001*
Use of excessive salt	4.43 (2.08 - 9.4)	0.22 (0.05 - 0.93)	0.04*
Smoking	31.67 (4.18 - 239.5)	0.008 (0 - 0.22)	0.005*
Depression	11.64 (5.67 - 23.89)	0.14 (0.03 - 0.6)	0.009*
Anxiety	7.29 (3.04 - 17.49)	0.65 (0.106 - 4.07)	0.6
Stress	6.05 (3.22 - 11.3)	0.805 (0.2 - 2.99)	0.7
Schizoid personality	3.2 (1.2 - 8.58)	0.47 (0.05 - 3.7)	0.4
Dissocial personality	4.06 (1.92 - 8.3)	0.08 (0.016 - 0.45)	0.004*
Impulsive personality	0.3 (0.19 - 0.62)	9.24 (2.2 - 38.3)	0.002*
Borderline personality	4.2 (2.29 - 7.9)	0.36 (0.109 - 1.198)	0.09
Anakastic personality	2.89 (1.47 - 5.4)	0.28 (0.06 - 1.19)	0.08
***P<0.05 is significant**			

4. Discussion

In this study their were multiple factors that showed a positive correlation with hypertension.

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