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# A Study on Psychiatric Morbidity in Patients with Hypertension

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**ABSTRACT**
Chronic forms of morbidity, including mental disorders and hypertension, play a central role in shaping the burden of disease in the developing countries. Few studies have systematically evaluated the relationship of psychiatric morbidity and hypertension. To assess the psychiatric morbidity in patients with essential hypertension in comparison with healthy controls. Forty consecutive patients attending General Medicine outpatient department with the diagnosis of Essential Hypertension were assessed for psychiatric illness using HADS (Hospital Anxiety And Depression Scale) and PSLES (Presumptive Stressful Life Events Scale) and 40 healthy controls were selected from general population. Psychiatric morbidity in two groups were assessed and compared. The prevalence of psychiatric morbidity in patients with hypertension is about 37% which is not statistically significant when compared with controls (15%). As per this present study, there is no statistically significant association between depression, anxiety and hypertension. However, psychiatric morbidity may be the result of complications of chronic hypertension which have their effects on the brain. Hence early addressing of hypertension is essential to prevent the development of psychiatric morbidity in those individuals.

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**Key Words**
Hypertension, psychiatric morbidity

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## INTRODUCTION

Hypertension is one the leading cause of global disease burden and is more prevalent in many developing countries, as in the developed countries. Chronic forms of morbidity, including mental disorders and hypertension, play a central role in shaping the burden of disease in the developing countries[1]. Despite its prevalence, only few studies have systematically evaluated the relationship between the two[2]. Psychiatric disorder occurring in the context of hypertension is difficult to evaluate, as many people diagnosed with hypertension usually have sleep disturbances, somatic symptoms, lower quality of life, and role impairment[3]. For a widely prevalent disease such as hypertension, even modest improvements in some targeted interventions may well have a significant impact at the whole population level[4]. Previous studies have shown both positive and negative correlation between hypertension, anxiety and depression. This study was done in an attempt to find the prevalence of psychiatric morbidity in hypertensive individuals. In parallel to hypertension, psychiatric disorders also represent a significant global health burden[5]. Over 25% of the population will develop psychiatric disorders[6]. The fact that hypertension is implicated in the development and progression of CVD and that hypertension seems to be more prevalent in those with higher levels of depression and/or anxiety[7,8] have led to the hypothesis that hypertension may be an intermediary link between psychopathology and CVD[9]. Mechanistically, this hypothesis also makes sense. Increased levels of both depression and anxiety are associated with health behavior patterns that increase the risk of developing hypertension (e.g., higher rates of smoking and less physical activity)[10-13], as well as physiological patterns that are predictive of increased blood pressure (BP) levels (e.g., elevated cardiovascular reactivity during stress and poor cardiovascular recovery following stress)[14-16]. Whilst there is evidence of a link between psychological factors and hypertension development[17-19], not all studies have found this association[20-23]. Depressive disorders have been associated with the development of coronary artery disease[24,25], stroke[26] and hypertension[27,28]. Other studies, however, have not found an association between depression and hypertension[29-33].

## MATERIALS AND METHODS

Institutional Ethical Committee approval was obtained for the study. Forty consecutive patients attending General Medicine outpatient department with the diagnosis of Essential Hypertension fulfilling the inclusion and exclusion criteria, were recruited for the study after getting informed consent from them and 40 healthy controls fulfilling the inclusion criteria were selected from general population and informed consent was obtained. Cases were subjected to detailed clinical and biochemical evaluation like blood sugar, urea, serum creatinine, ECG to rule out other medical co-morbidities.

**Inclusion Criteria:**

- Patients between 30-60 years of age, who were diagnosed with essential hypertension as per JNC-8(Joint National Committee) criteria, (cases).
- Healthy individuals between age group 30-60 years of age, without any medical illness and substance use (controls).

**Exclusion Criteria:**

- Those with Secondary hypertension.
- Patients of essential hypertension with complications.
- Patients diagnosed with other comorbid medical illness.
- Patients who did not consent for the study.

The aforementioned patients were excluded for the study. A semi-structured proforma was used to collect data regarding socio-demographic profile, duration of hypertension, treatment details and compliance. Mini-International Neuropsychiatric Interview (MINI) was administered to both cases and controls to diagnose psychiatric illness. Scales like HADS (Hospital Anxiety And Depression) and PSLES (Presumptive Stressful Life Events Scale) were also administered to them. Prevalence of psychiatric morbidity in both cases and controls were compared.

## RESULTS AND DISCUSSIONS

From (Table 1), it is found that there was no statistical significant difference between cases and controls with regard to sociodemographic profile. This indicates that the case and control samples were well matched and the confounding effects of these factors were also not significant. Majority of the respondents belonged to the age group of 41-50 years (57%) and their education was up to primary class (30%). Majority of them belonged to rural locality (52%) and doing unskilled occupation (43%). Most of them were hindu by religion (87%) and majority of them belonged to upper lower socioeconomic status (85%). From (Table 2), it was inferred that around 57 % of cases had duration of hypertension <2 years and 43% of cases had duration of hypertension >2 years. Cases with regular compliance to treatment were about 42% and the rest were not on regular treatment. (Table 3) shows that 15% of cases had family history of psychiatric illness and family history of suicide. Among controls, family history of psychiatric illness was present in 5% and family history of suicide was present in about 3%. (Table 4) shows the frequency distribution of psychiatric illness among cases and controls. Among

**Table 1: Sociodemographic Profile of Cases and Controls**

| S.NO | Variables | Cases (N=40) | | Controls (N=40) | | Statistical |
|---|---|---|---|---|---|---|
| | | N | % | N % | Results | |
| 1. | Age | | | | | |
| | 30-40 | 9 | 22.5 | 11 | 27.5 | |
| | 41-50 | 23 | 57.5 | 24 | 60 | $\chi^2$=0.91 |
| | 51-60 | 8 | 20 | 5 | 12.5 | df =2 |
| 2 | Sex | | | | | |
| | Male | 23 | 57.5 | 24 | 60 | $\chi^2$=0.52 |
| | Female | 17 | 42.5 | 16 | 40 | df=1 |
| 3. | Education | | | | | |
| | Illiterate | 16 | 40 | 16 | 40 | |
| | Upto Primary | 13 | 32.5 | 12 | 40 | $\chi^2$=0.83 |
| | High School | 11 | 27.5 | 12 | 30 | df=2 |
| 4. | Locality | | | | | |
| | Rural | 21 | 52.5 | 22 | 55 | $\chi^2$=0.05 |
| | Urban | 19 | 47.5 | 18 | 45 | df=1 |
| 5. | Occupation | | | | | |
| | Unemployed | 10 | 25 | 10 | 25 | |
| | Unskilled | 17 | 42.5 | 17 | 42.5 | $\chi^2$=0.158 |
| | Semiskilled | 5 | 12.5 | 6 | 15 | df=3 |
| | Business/Clerical | 8 | 20 | 7 | 17.5 | |
| 6. | INCOME | | | | | |
| | 1601-4809 | 16 | 40 | 16 | 40 | |
| | 4810-8009 | 17 | 42.5 | 15 | 37.5 | $\chi^2$=0.375 |
| | 8010-12019 | 7 | 17.5 | 9 | 22.5 | df=2 |
| 7. | Religion | | | | | |
| | Hindu | 35 | 87.5 | 37 | 92.5 | $\chi^2$=0.56 |
| | Others | 5 | 12.5 | 3 | 7.5 | df=1 |
| 8. | Socio Economic Status | | | | | |
| | Lower | 2 | 5 | 3 | 7.5 | $\chi^2$=O.881 |
| | Upper Lower | 34 | 85 | 35 | 87.5 | df=2 |
| | Lower Middle | 4 | 10 | 2 | 5 | |

**Table 2: The Duration of Hypertension and Compliance with Treatment Among Cases**

| S.NO | Variable | Frequency | Percent |
|---|---|---|---|
| 1 | Duration of Hypertension | | |
| | 1Year | 11 | 27.5% |
| | 2 Years | 12 | 30% |
| | 3 Years | 6 | 15% |
| | 4 Years | 6 | 15% |
| | 5 Years | 4 | 10% |
| 2 | Compliance with Treatment | | |
| | Regular | 17 | 42.5 |
| | Irregular | 23 | 57.5 |

**Table 3: Comparison of Family History of Psychiatric Illness and Suicide Among Cases and Controls**

| S.NO | Variables | Cases (N=40) | | Controls (N=40) | |
|---|---|---|---|---|---|
| | | N | % | N | % |
| 1. | Family H/O Psychiatric Illness | | | | |
| | Present | 6 | 15 | 2 | 5 |
| | Absent | 34 | 85.0 | 38 | 95.0 |
| 2 | Family H/O Suicide | | | | |
| | Present | 6 | 15 | 1 | 2.5 |
| | Absent | 34 | 85.5 | 39 | 97.5 |

**Table 4: Prevalence of Psychiatric Illness Among Cases and Controls**

| S.NO | Variables | Cases (N=40) | | Controls (N=40) | | Stastical Results |
|---|---|---|---|---|---|---|
| | | N | % | N | % | |
| 1. | No Psychiatric Disorder | 25 | 62.5 | 34 | 85 | |
| 2 | Depression | 10 | 25 | 5 | 12.5 | $\chi^2$=6.04 df=3 |
| 2. | Dysthymia | 2 | 5 | 0 | 0 | |
| 3. | Mixed Anxiety and Depression | 3 | 7.5 | 1 | 2.5 | |

**Table 5: Hads Score Among Cases and Controls**

| S.NO | Variables | Cases (N=40) | | Controls (N=40) | |
|---|---|---|---|---|---|
| | | N | % | N | % |
| 1 | HADS-Anxiety | | | | |
| | 0-7-NO | 30 | 75.0 | 36 | 90.0 |
| | 7-10-BODER LINE | 6 | 15.0 | 3 | 7.5 |
| | 11-21-CASES | 4 | 10.0 | 1 | 2.5 |
| 2 | HADS-DEPRESSION | | | | |
| | 0-7 -NO | 17 | 42.5 | 26 | 65.0 |
| | 8-10-BODERLINE | 10 | 25 | 9 | 22.5 |
| | 11-21 -CASES | 13 | 32.5 | 5 | 12.5 |

**Table 6: Comparison of HADS and PSLES Scores**

| S.No | Variables | CASES (40) | | CONTROLS(40) | | 't' VALUE |
|---|---|---|---|---|---|---|
| | | Mean | SD | Mean | SD | |
| 1. | HADS Anxiety Score | 5.40 | 3.136 | 4.43 | 2.818 | 1.462 |
| 2. | HADS Depression Score | 8.83 | 4.590 | 6.75 | 3.747 | 2.215 |
| 3. | PSLES-no of Events | 1.65 | 0.802 | 1.40 | 0.545 | 1.630 |
| 4. | PSLES-Total Score | 88.23 | 42.249 | 72.35 | 33.864 | 1.854 |

**Table 7: Correlation Table**

| S. NO | Variables | Duration of Illness | HADS Anxiety Score | HADS Depression Score | PSLE number of Events | PSLE-Total Score |
|---|---|---|---|---|---|---|
| 1 | Duration of Illness | 1 | | | | |
| 2 | HADS Anxiety Score | 0.001 | 1 | | | |
| 3 | HADS Depression Score | 0.081 | 0.602** | 1 | | |
| 4 | PSLE number of events | -0.210 | 0.322* | 0.254 | 1 | |
| 5 | PSLE - Total Score | -0.127 | 0.274 | 0.192 | 0.905** | 1 |

cases 37% had psychiatric illness, of which depression contributes to 25% and 7% suffered from mixed anxiety and depression and dysthymia was present in about 5%. Prevalence of psychiatric illness among controls was about 15%, of which 13% suffered from depression. Mixed anxiety and depression was present in about 2%. From (table 5), it could be inferred that in HADS-Anxiety, 10% of cases scored between 11-21 and in HADS-Depression, 13% scored between 11-21. From (table 6) it was found that there was no statistical difference between cases and controls with regard to HADS score and PSLES. Hence, it is inferred that prevalence of psychiatric disorders among cases and controls are similar. From (table 7), it could be inferred that, there was significant positive correlation between PSLES and HADS-ANXIETY score. There is no significant correlation between duration of hypertension and HADS, PSLES.

As per this present study, there is no statistically significant association between depression, anxiety and hypertension. Hence presence of essential hypertension alone in an individual is not contributory to the occurrence of psychiatric disorders. In this present study, the stressful life events experienced and their association with psychiatric morbidity was also assessed. We inferred that there was no significant association between stressful life events and psychiatric morbidity among cases. Our study finding is supported by previous studies done by Anna Grimsrud[34], Shinn[20] and, Maatouk[35]. However a few studies are contradictory to our study findings. Studies by Carroll[36] and Saboya[37] showed that there was an association between psychiatric illness and hypertension. Hypertension is often a risk factor for other chronic conditions, a potential confounder which may itself be a significant contributor to occurrence of depression and anxiety. Therefore an observed association between hypertension and psychiatric disorder may not persist after adjustment for other chronic conditions, as the true association may be between the severe chronic condition and psychiatric disorder. With the literature available, many authors studied the relationship between hypertension and either depression or anxiety alone and only a few studied both depression and anxiety. Some studies show relation only for anxiety and not depression Markovitz (1993), Paterniti[38]. Some studies such as those done by Sabrina Paterniti[39] and Hildrum[40] support the view that low blood pressure is the risk factor for the occurrence of depression, Some epidemiological studies have found that depression/ anxiety symptoms are predictive of later development of hypertension, even after controlling confounding factor (Jonas[27] and Davidson[28]). Various evidences suggest that relationship between depression and hypertension may be the result of insufficient recognition of multiple pathways of opposite directions linking depressive symptoms with BP, hypertension related drugs. The findings from this present study, which do not support the association between hypertension and psychiatric morbidity may be due to the following factors.

- All the cases in the sample are early hypertensive patients with majority having the duration of illness of <2 years.
- All the cases are essential hypertension without complications.
- All the cases are on anti hypertensive treatment.

These factors and findings of previous studies, support the hypothesis that, Essential hypertension and psychiatric morbidity may not share the common etiology. However, psychiatric morbidity may be the result of complications of chronic hypertension, which have their effects on the brain. Long standing hypertension causes end organ damage, affecting small vessels of brain which leads to ischemic changes and may result in psychiatric morbidity, early dementia, vascular depression. Anti hypertensive drugs have mood stabilizing and anxiolytic properties, which may mask the psychiatric symptoms. Hence early addressing of hypertension is essential to prevent the development of psychiatric morbidity in those individuals.

**Limitations:**

- The study sample is small, further studies on larger sample are needed.
- The study sample is government hospital based, which caters middle and lower socioeconomic status, these findings cannot be extrapolated to the general population.
- This study is a cross sectional descriptive study, hence the longitudinal course and outcome of the patients could not be assessed.

## CONCLUSION

Although there is no definite evidence for association between hypertension and depression, co morbid psychiatric illness can worsen the prognosis of hypertension, if not adequately treated. Further larger studies to establish the relationship between these two are necessary and research into common neurobiological underpinnings of both may lead to better treatment outcome.

**Conflict of Interest:** None.

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