Prevalence of depression in patients attending general medicine outpatient department for hypertension

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ABSTRACT

Background: Despite the rise in medical disorders such as hypertension, diabetes, and cardiovascular disorders along with the high rates of psychological ailments such as depression and anxiety among the general population, only few studies have been conducted in India to assess the occurrence of depression among hypertensive patients attending medical outpatient care. **Objectives:** This study is being done to study the prevalence of undiagnosed depression in hypertensive cases. **Materials and Methods:** The study was based on a cross-sectional study design, with a sample of 100 hypertensive patients attending general medicine outpatient department at a tertiary care center. Blood pressure (BP) readings were conducted using a mercury column sphygmomanometer. The BP readings were taken in a sitting position with the patient's arm positioned roughly at the level of their heart. Normal BP is defined as <120/<80 mm Hg, elevated BP 120–129/<80 mm Hg, hypertension stage 1 is 130–139 or 80–89 mm Hg, and hypertension stage 2 is ≥140 or ≥90 mm Hg. Participants were then assessed using a pro forma to elicit sociodemographic details an Hamilton depression rating scale. **Results:** Out of the 100 participants, 37% had elevated BP, 28% and 35% had Stage 1 and Stage 2 hypertension, respectively. Prevalence of depression was 40%. 18 participants had mild depression, 13 had moderate, and 9 had severe depression. **Conclusions:** The prevalence of undiagnosed depression in hypertensive patients was 40% which is extremely high when compared to the prevalence of depression in the general population. The underlying causes of depression need to be addressed, and community programs need to be initiated to raise awareness regarding long-term complications of untreated depression.

KEY WORDS: Prevalence; Depression; Hypertension

INTRODUCTION

Hypertension is one of the leading causes of mortality and disability around the globe.[1] In 2010, it had been estimated that 31.1% of the global population a 31.1% of the global population was hypertensive.[1] Recent studies from India have shown that about 33% urban and 25% of rural Indians are hypertensive.[2] The rates for HTN in percentage are projected to go up to 22.9 and 23.6 for Indian men and women, respectively, by 2025.[3] Accountable for 9.4 million deaths annually, hypertension is responsible for a variety of diseases, such as cardiovascular diseases, renal failure, and stroke.[4]

Normal BP is defined as <120/<80 mm Hg, elevated BP 120–129/<80 mm Hg, hypertension stage 1 is 130–139 or 80–89 mm Hg, and hypertension stage 2 is ≥140 or ≥90 mm Hg. Before labeling a person with hypertension, it is important to use an average based on ≥2 readings obtained on ≥2 occasions to estimate the individual's level of BP.[5]

Depression affects 350 million people around the world with a lifetime risk of 7%.

Depression is likely to cause a 5.7% increase in the global burden of disease by 2020 and is to become the leading cause of disability worldwide by the year 2030.[1] India is home to an estimated 57 million people (18% of the global estimate) affected by depression.[6]

Mental disorders, especially depression share common determinants with noncommunicable diseases non convertible debenture (NCD) and frequently cooccur.[6] Poor mental health can be a precursor to or a consequence of NCDs, and it can exacerbate NCD risk factors such as unhealthy diet, physical inactivity, tobacco use, and harmful alcohol use.[6] Prevalence of major depression among individuals with NCDs ranges from 22% to 33%, and the prevalence of depression in hypertension is estimated to be up to 29%.[7]

Prior studies have acknowledged the link between hypertension and depression, but the results vary. Several studies support the hypothesis between the associations of depression among hypertensive patients.[8] The two may be associated with each other due to increased adrenergic activity during the state of depression thus causing a pressor effect on the cardiovascular system.[9] On the contrary, few studies supported that decreased blood pressure was seen in anxious or depressed patients,[10] as opposed to some that found no association.[11]

Depression and hypertension combined have a far more detrimental effect on health than individually and are reported to decrease the quality of life and cause an increased risk of myocardial infarction and stroke.[4]

Despite an increase in the prevalence of depression and hypertension, few studies have been conducted in India to assess the relationship between depression and hypertension. Therefore, this study is being done focusing on depression and hypertension so as to allow for comprehensive healthcare planning.

Aims and Objectives

The aim of the study was to assess the prevalence of depression in hypertensive patients attending general medicine outpatient department (OPD) at a tertiary care center.

MATERIALS AND METHODS

A tertiary care hospital based cross-sectional study was conducted for a period of 6 months from January 2018 to June 2018 after approval from the Institutional Ethics Committee. 100 hypertensive patients attending general medicine OPD were selected using convenience sampling and after taking informed consent was assessed using a pro forma to elicit sociodemographic details a Hamilton depression rating scale (HDRS).

Demographic data: Participants were interviewed, and information regarding age, sex, family type, education, monthly income, family history of hypertension, lifestyle factors (e.g., smoking and alcohol intake) were collected.

Body Mass Index (BMI): BMI is calculated as weight in kilograms divided by the square of the height in meters (kg/m^2) and is categorized into four groups according to the Asian-Pacific cutoff points: Normal weight (18.5–22.9 kg/m^2), overweight (23–24.9 kg/m^2), and obese (>25 kg/m^2).[12]

Blood pressure (BP): BP readings were conducted using a mercury column sphygmomanometer. The BP readings were taken in a sitting position with the patient's arm positioned roughly at the level of their heart. Normal BP is defined as <120/<80 mm Hg, elevated BP 120–129/<80 mm Hg, hypertension stage 1 is 130–139 or 80–89 mm Hg, and hypertension stage 2 is ≥140 or ≥90 mm Hg. For the purpose of measuring BP, guideline for the prevention, detection, evaluation, and management of high BP in adults: A report of the American College of Cardiology/American heart association task force on Clinical Practice Guidelines was followed.[5]

Depression: Depression assessments were made using HDRS. The HDRS (also known as the Ham-D) is the most widely used clinician-administered scale used for assessment of depression.[13] The original version contains 17 items (HDRS17) pertaining to symptoms of depression experienced over the past week.[13] In a review of the HAM-D, Bag by and colleagues examined the psychometric properties of the 17-item version across 70 studies, including reliability, item-response characteristics, and validity of the measure. Results indicated adequate reliability (internal, inter-rater, and retest reliability) and validity (convergent, discriminant, and predictive validity).[14] The severity ranges for the HAMD: No depression (0–7); mild depression (8–16); moderate depression (17–23); and severe depression (≥24).[15]

Inclusion Criteria

- Outpatients in the age group of 35–75 years of age and previously diagnosed with hypertension for a duration of at least 6 months were included in this study.

Exclusion Criteria

The following criteria were excluded from the study:
- Patients with other medical comorbidities such as diabetes mellitus, renal disease, previous history of myocardial infarction, or stroke
- Pregnancy
- History of depression or currently on antidepressants.

Statistical Analysis

Data entry was done in Microsoft Excel 2010 and analysis will be done using Software Epi Info Version 6. Data were depicted in the form of percentages and frequencies.

RESULTS

Most of the study population belonged to the age group of 55–75 years (58%). The proportion of female population (70%) was more when compared to males (30%). 96% of the participants were married and 67% had primary level of education. Majority of the population belonged to low socioeconomic status and 40% were unemployed. 64% and 20% of participants reported a family history of hypertension and depression respectively. On assessing BMI, 39% of participants were overweight and 12% were obese [Table 1].

Out of the 100 participants, 37% had elevated BP, 28% and 35% had Stage 1 and Stage 2 hypertension, respectively. Prevalence of depression was 40%. 18 participants had mild depression, 13 had moderate, and 9 had severe depression [Table 2 and Figure 1]

DISCUSSION

The study found out that majority (60%) were in the 55–75 years age group. There was almost an equal distribution of different stages of hypertension, and 39% were overweight and 12% had associated obesity. The population had twice the number of females than males. 40% of subjects were suffering from different severity of depression.

In our study, the prevalence of undiagnosed depression among hypertensive patients was 40%. This is similar to the

**Table 1:** Sociodemographic characteristics of participants by depression status

Variable	Total	No depression	Mild depression	Moderate depression	Severe depression
Age					
35–54	42	22	11	5	4
55–75	58	37	9	8	4
Sex					
Male	30	21	3	4	2
Female	70	42	7	12	9
Marital status					
Unmarried	4	2	1	1	0
Married	96	63	21	10	2
Education					
Primary	67	51	9	4	3
Secondary	19	10	6	2	1
Graduate	14	9	2	2	1
Employment					
Unemployed	40	28	8	3	1
Employed	60	38	10	7	5
Socioeconomic status					
APL	22	16	4	1	1
BPL	78	45	20	7	6
Family history of hypertension					
Yes	64	33	13	11	7
No	36	24	7	5	0
Family history of depression					
Yes	20	10	6	3	1
No	80	52	15	7	6
BMI					
Normal (18.5–22.9 kg/m^2)	49	40	5	3	1
Overweight					
(23–24.9 kg/m^2)	39	16	11	9	3
Obese(>25 kg/m^2)	12	7	2	2	1

BMI: Body mass index

Table 2: Severity of hypertension by depression status

Variable	Total	No depression	Mild depression	Moderate depression	Severe depression
Elevated BP	37	23	6	5	3
Stage 1	28	16	7	4	1
Stage 2	35	21	5	4	5

BP: Blood Pleasure
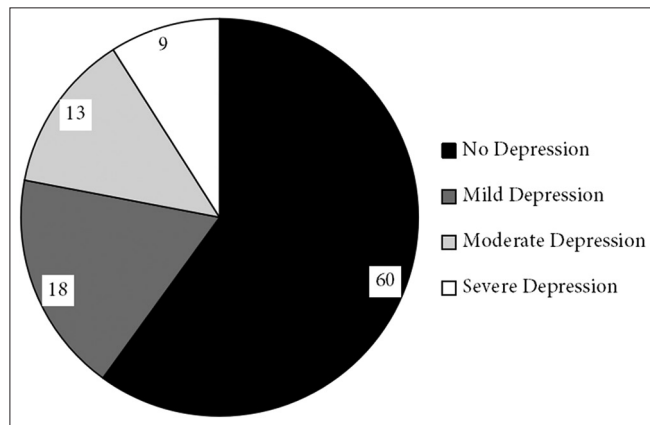
Figure 1: Study population representation of the severity of depression

prevalence reported by a cross-sectional study conducted in Pakistan where they concluded that 40.1% of hypertensive individuals are depressed. This prevalence is also similar to that observed in other groups like the prevalence of depression was 16.9% reported among the diabetic patients in urban Indian population.[16] Furthermore, the prevalence of depression in hypertension is considerably higher when compared to the general population. This can be substantiated by a study conducted on the prevalence of depression in urban South Indian population which reported 16.9% prevalence.[17] The possible reasons for the high prevalence of depression among hypertensives could be the psychological impact of being aware of a chronic condition and the financial constraints in health-care costs, the resultant stressors, and increasing disability. Our study backs the existent finding of depression being more prevalent in women compared to men. Out of 70 female participants, 28 had depressive symptoms and 9 had severe depression. A clear understanding of the factors resulting in an increased prevalence of depression in women remains unknown. It is possible that the physiological and genetic factors along with the gender-specific social roles could be contributing to the increased prevalence. Weaver and Hadely found in female diabetics in India an increased risk for depression if women were not fulfilling gender-specific social roles such as getting up early, preparing family meals, looking after children and grandchildren, cleaning the house, and running errands.[18] We also found more number of participants with depression in the age group of 55–75 years. This finding is in agreement with the study by Barua *et al.* that concluded increasing prevalence of elderly depressives in developing countries. This could be due to a lack of advanced diagnostic tools that differentiate dementia from

depression thus preventing a misdiagnosis.[19] Majority of our participants (78%) belonged to low socioeconomic status and out of the 78 participants, 33 reported depressive symptoms. Low socioeconomic settings usually have a low education status and this may result in decreased mental resources to cope with the stressor and increased risk for depression.[4] This may also result in low awareness of how to recognize and tackle the health needs in early stages. Longitudinal studies have found evidence that hypertension is associated with clinical depression but also that clinical depression is an independent risk factor for hypertension.[20] Depression in hypertensive patients is associated with poorer health status, increased medical sources, and increased mortality. [1] People with depression could also suffer from a lack of occupational and social role function.[1] All these factors could exacerbate the depressive symptoms in a hypertensive patient. In contrast, a study conducted by Hildrum *et al.* found that a high symptom level of anxiety and depression at baseline predicted low systolic BP at follow-up.[10] Change in symptom level of anxiety and depression between baseline and follow-up was inversely associated with a change in systolic BP. For diastolic BP, the findings were weaker or non-significant. They postulated neuropeptide Y as the possible mechanism between this association.[10] Neuropeptide Y has effects in various domains such as food intake, BP, and mental health. Patients with depression have altered levels of neuropeptide Y, and cerebrospinal fluid levels of neuropeptide Y have been found to be inversely associated with anxiety scores in these patients.[21] Regarding the cardiovascular system, neuropeptide Y in the brain seems to suppress sympathetic activity and decrease BP, whereas in the peripheral nervous system it induces vasoconstriction, which may be of a transient nature.[21] Although the effects of neuropeptide Y and related peptides on vascular regulation are only partly understood, it seems reasonable that they are involved both in the well-known acute stress-induced increase in BP and the long-term inverse association between anxiety and depression and BP.[22] Wiehe *et al.* in a cross-sectional study evaluated the association between depression and hypertension and concluded that hypertension and depression were not associated in this free-living population of adults, suggesting that their concomitant occurrence in clinical practice may be ascribed to chance.[11] Depression could, in turn, lower the rate of treatment compliance in hypertension.[1] The exact mechanism by which depression affects compliance to antihypertensive medications is not clear. Several characteristics of depression could have detrimental effects on adherence including motivation,

pessimism over the effectiveness of medication, decreased memory, cognition, self-care, and even intentional self-harm.[23] Furthermore, depressive patients are more sensitive to the unpleasant side effects of medications.[24]

Strengths and Limitations

The major strengths of the study are comprehensive and technically sound evaluation of cases. The limitations include being the cross-sectional nature of study and absence of comparative control group.

CONCLUSION

The prevalence of undiagnosed depression in hypertensive patients was 40% which is extremely high when compared to the prevalence of depression in the general population. The underlying causes of depression need to be addressed, and community programs need to be initiated to raise awareness regarding long-term complications of untreated depression.

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