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Original Research Article

Epidemiological determinants associated with depression among adult hypertensives in an urban field practice area: a cross sectional study

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ABSTRACT

Background: Non-communicable diseases cause, more than 50% of deaths and cardiovascular diseases emerged as the most important cause of it. Hypertension affects about 1 billion people worldwide and it is estimated that by 2025, up to 1.58 billion adults while the comorbidity of depression, anxiety, and cardiovascular diseases is an important public health concern representing 31% of all deaths. Objectives were to study prevalence of depression among adult hypertensive study subjects and to assess the epidemiological determinants associated with depression among adult hypertensives.
Methods: A single centre, cross-sectional observational study was conducted among 350 hypertensive adult of urban field practice area of teaching medical institute with 10 months period from May 2019 to March 2020. A semi-structured, pre-tested questionnaire was used for data collection and 21 items self-reporting Becks Depression Inventory scale (BDI) was used for assessment of depression. The BDI score <10 denotes normal or no depression & the score >10 denotes depression. The data was analyzed using IBM SPSS software 16 trial version. The Chi-square test was used for test of significance.
Results: Out of total of 350 study subjects, males were 100 and females were 250. Out of them, 151 had depression. The overall proportion of depression among study subjects was found to be 43.14%.
Conclusions: In present study, proportion of depression among hypertensives was found to be high i.e. 43.14%. Lower socio-economic status, altered sleep pattern, addiction history, history of loneliness, low educational status more likely to have co-morbid depression.

Keywords: Hypertension, Depression, Urban area, India

INTRODUCTION

Non-communicable diseases also known as chronic diseases or as socially transmitted diseases, cause, more than 50% of deaths and cardiovascular diseases (CVDs) emerged as the most important cause of it.[1] They have become a major public health problem, the world over, and the burden has increased manyfold in low to middle-income countries compared to infectious diseases (world health organization, 2008). The prevalence of depression among patients with NCDs ranged from 22% to 33% while the prevalence among hypertensives was 29%.[2] Globally, cardiovascular diseases account for approximately 17 million deaths a year. It has been predicted that cardiovascular diseases will be the major cause of morbidity and mortality in developing countries in the foreseeable future. The relationship between blood pressure and the risk of cardiovascular disease events is continuous, consistent, and independent of other risk factors. They account for nearly a third of all deaths worldwide.[3] Worldwide, 20% of CVD deaths occur in

India. The burden of NCDs on individuals, families, communities, and health systems is significant in India.[4] Hypertension affects about 1 billion people worldwide and it is estimated that by 2025, up to 1.58 billion adults will suffer from complications of hypertension.[5] Hypertension is the most recognized modifiable risk factor of cardiovascular diseases, stroke, and end-stage renal disease.[6] Depression often co-occurs with chronic physical illnesses such as hypertension, diabetes mellitus, and epilepsy. These chronic physical illnesses sometimes lead to a decrease in the patient's quality of life and thus increase the risk of developing depression.[7] While the relationship between comorbid anxiety-depression and chronic physical illnesses such as hypertension was examined in the data from 17 countries that completed World Mental Health Surveys.[8] Over the past several decades, a high prevalence of depression has been reported among patients with a range of chronic illnesses including 17 to 27% of patients with cardiovascular disease, 11 to 31% of patients with diabetes, and 10 to 24% of patients with arthritis. [9]

Indian studies have reported that prevalence rates of depression vary from 21-83% in primary care practices.[10] The comorbidity of depression, anxiety, and cardiovascular diseases is an important public health concern because cardiovascular diseases are the leading cause of death globally, representing 31% of all deaths.[11] When both the comorbidities exist (sub-clinical depression and hypertension), there is increased risk for reduced quality of life, increased risk of stroke or myocardial infarction, reduced therapeutic compliance for anti-hypertensive therapy, increased risk of suicide in future, developed unipolar depression and higher use of limited healthcare resources.[12] There have been a few populations based studies from India but most have been done on selected groups. Therefore, study have been conducted to study the prevalence of depression among adult hypertensive study participants and to assess the epidemiological determinants associated with depression among adult hypertensives.

METHODS

A single centre, cross-sectional observational study was conducted among 350 hypertensive adult of urban field practice area of teaching medical institute in a Metropolitan city with 10 months duration from May 2019 to March 2020. Prevalence of depression among hypertensives was taken as 33.3%.[13] Sample size of 350 calculated with Cochrane formula with prevalence of 33.3%, with 95% confidence interval with 9 sampling units have been added to account for attrition, as a consideration of buffer. The study was conducted after obtaining permission from the Institutional Ethics Committee & confidentiality of all study participants was maintained. Patients attending the Out Patient Department (OPD) in the urban field practice of tertiary care centre were included in the study meeting with inclusion & exclusion criteria. After obtaining informed consent adults more than 18 years of age, who were diagnosed as hypertensives included in the study and those hypertensive patients who were not willing to participate in the study and those who were pregnant at the time of the study were excluded from the study.

A semi-structured questionnaire has been administered by face-to-face interview method. The questionnaire comprised of the following parts: Part 1: Sociodemographic details, Past medical history, general and systemic examination of the patient, assessment of risk factors for hypertension. Part 2: Assessment of depression by applying 21 items Becks depression inventory scale among study subjects.[14] Each item consists of 4 responses, the minimal score is 0 and the maximum score is 63. The BDI score <10 denotes normal or no depression & the score >10 denotes depression. The categorization of depression as per Becks depression inventory (BDI) score is; 0-10 indicates normal, 10-16 indicates mild mood disturbance,17-20 indicates borderline clinical depression, 21-30 indicates moderate depression, 31-40 indicates severe depression and BDI score >40 indicates extreme depression. As per Becks depression inventory, the patients who had a score of more than 30 were referred to a higher centre for further treatment.

Blood pressure was measured in a sitting position with a suitable-sized cuff in the right arm using a mercury sphygmomanometer. It was measured two times without any gap in between and the average was taken. Blood pressure was measured after taking 5 min rest. According to the Joint National Committee 7 (JNC7), normal blood pressure is systolic blood pressure <80 mmHg. Hypertension is considered when systolic blood pressure is >140 mmHg and Diastolic blood pressure >90 mmHg.[15] The data was entered in MS Excel 2010 and analyzed using IBM SPSS software 16 trial version. The Chi-square test was used as a test of significance.

RESULTS

Total adult hypertensive study subjects were 350, out of the total, 100 were males and 250 were females. Amongst all adult hypertensives, the minimum age of the participants was found to be 37 years and the maximum age was 90 years. The mean age of the study subjects was found to be 60.35 years. Majority of 130 (37.14%) of study subjects belonged to the age group 55-64yrs.The maximum study subjects viz. 243 (69.4%) were illiterate, 78 (22.3%) had completed primary education and 326 (93.14%) were unemployed. Out of the study subjects, mostly they were married 229 (65.4%) followed by widow 116 (33.1%), 176 (50.3%) belonged to the lower-middle-class family (III) followed by 125 (35.7%) lower-class family (V), the majority 289 (82.6%) had no addiction history, 190 (54.3%) had disturbed sleep pattern, 137 (39.1%) had history of loneliness, 303(86.6%) had history of financial dependence on family members and 302 (86.3%) having history of lack of family care/caregivers (Table 1).

Table 1: Socio- demographic profile of study subjects.

Socio-demographic variables		N	%
Age (years)	35-44	22	6.29
	45-54	67	19.14
	55-64	130	37.14
	65-74	99	28.29
	75-84	29	8.29
	85-94	3	0.86
Religion	Hindu	152	43.43
	Muslim	193	55.14
	Christian	05	1.43
Education status	Primary	78	22.3
	Secondary	18	5.1
	Higher Secondary	5	1.4
	Graduate	6	1.7
	Illiterate	243	69.4
Occupation	Employed	24	6.86
	Unemployed	326	93.14
Type of work	Heavy Work	1	0.3
	Light Work	41	11.7
	Moderate Work	308	88.0
Marital status	Divorced	1	0.3
	Married	229	65.4
	Unmarried	4	1.1
	Widow	116	33.1
Socio-economic status	Upper (I)	0	0
	Upper Middle (II)	40	11.4
	Lower Middle (III)	176	50.3
	Upper Lower (IV)	9	2.6
	Lower (V)	125	35.7
Sleep pattern	Disturbed	190	54.3
	Normal	160	45.7
Addiction history	Alcohol	5	1.4
	Tobacco chewing	41	11.7
	Smoking	5	1.4
	Masheri	10	2.9
	No addiction	289	82.6
History of loneliness	Yes	137	39.1
	No	213	60.9
History of financial dependence on family members	Yes	303	86.6
	No	47	13.4
History of lack of family care/caregivers	Yes	302	86.3
	No	48	13.7
Total		350	100

Table 2: Distribution of study subjects according to levels of depression (as per Becks depression inventory).

Levels of depression	N	%
Extreme depression	1	0.3
Mild mood disturbance	20	5.7
Borderline clinical depression	28	8.0
Severe depression	31	8.9
Moderate depression	71	20.3
Normal	199	56.9
Total	350	100

The proportion of depression among all adult hypertensive study subjects was found to be 43.14% (Figure 1). Out of the female (30.86%) had more proportion of depression than males (12.29%). As per Becks Depression Inventory scale, the majority were normal 199 (56.9%), followed by 71 (20.3%) with moderate depressive symptoms, 31 (8.9%) with severe depressive symptoms, 28 (8.0%) borderline clinical depressive symptoms, 20 (5.7%) had mild mood disturbance and 1 (0.3%) had extreme depressive symptoms (Table 2). The psychological factors which were significantly associated with depression ($p<0.05$) in this study were type of work, marital status, socio-economic status, sleep pattern, addiction history, history of loneliness, history of financial dependence on family members while gender, occupation, history of lack of family care/caregivers was found to be not significantly associated with depression among study subjects ($p>0.05$) (Table 3).

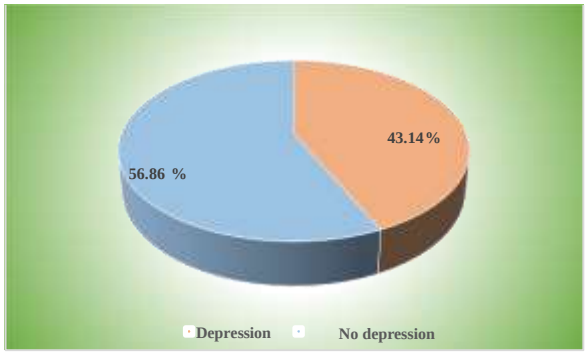

Figure 1: Proportion of depression among study subjects.

DISCUSSION

A single centre, cross-sectional observational study was conducted among 350 hypertensive adult of urban field practice area of teaching medical institute in a Metropolitan city. out of the total, 100 were males and 250 were females. Amongst all adult hypertensives, the minimum age of the participants was found to be 37yrs and the maximum age was 90 years. The mean age of the study subjects was found to be 60.35 years. Majority of 130 (37.14%) of study subjects belonged to the age group 55-64 years. The maximum study subjects viz. 243 (69.4%) were illiterate, 78 (22.3%) had completed primary education and 326 (93.14%) were unemployed. Out of the study subjects, mostly they were married 229 (65.4%) followed by widow 116 (33.1%), 176 (50.3%) belonged to the lower-middle-class family (III) followed by 125 (35.7%) lower-class family (V), the majority 289 (82.6%) had no addiction history, 190 (54.3%) had disturbed sleep pattern, 137 (39.1%) had history of loneliness, 303 (86.6%) had history of financial dependence on family members and 302 (86.3%) having history of lack of family care/caregivers. Similar finding results were found in a cross-sectional study conducted at the Civil Hospital Karachi outpatient department by Mahmood et al from January 2017 to April 2017. The sample size was 411 hypertensive patients. The prevalence of depression within 411 hypertensive patients was found to be 40.1% (n=165). The mean age of the sample was 45.7±11.2 years, and majority were females (72%, n=295), unemployed (72%, n=296), had primary or no education (67%, n=277), and were of low socioeconomic status (78%, n=321).[16] In current study, the proportion of depression among hypertensive study subjects was found to be 43.14% in which females had a majority 108 (30.86%) of the proportion of depression and male had 43 (12.29%). Similar findings were found in the cross-sectional study conducted by Prathibha et al where prevalence of depression among hypertensive individuals in this study was 33.3%.

The psychological factors which were significantly associated with depression ($p<0.05$) in this study were type of work, marital status, socio-economic status, sleep pattern, addiction history, history of loneliness, history of financial dependence on family members while gender, occupation, history of lack of family care/caregivers was found to be not significantly associated with depression among study subjects ($p>0.05$). Similar findings were found in the cross-sectional study where gender, socio-economic status, marital status, low educational status, regular physical activity, duration of hypertension, uncontrolled BP, were found to be significantly associated with depression.[17]

In present study, as per Becks depression inventory scale, the majority were normal 199 (56.9%), followed by 71 (20.3%) with moderate depressive symptoms, 31 (8.9%) with severe depressive symptoms, 28 (8.0%) borderline clinical depressive symptoms, 20 (5.7%) had mild mood disturbance and 1 (0.3%) had extreme depressive symptoms (Table 2). Similar study findings were found in a study conducted by Stanetic et al indicated Primary Health Centre Banja Luka, Bosnia, and Herzegovina which was done to assess prevalence of depression in patients with hypertension using beck depression inventory. The results of this study showed that as per becks depression inventory the 54.0% with hypertension had no present symptoms of depression, remaining 46.0% of study subjects showed symptoms of depression in which 29.0% had mild depression, 10.5% had moderate depression, and 6.5% had severe depression.[18]

In another study conducted by Taqui et al in Karachi, Pakistan revealed that in multiple logistic regression analysis the nuclear family system, female sex, being single or divorced/widowed, unemployment, and having a low level of education were significant in this study ($p<0.05$).[19] A cross-sectional study conducted by D'souza rt al on the prevalence of depression among elderly in an urban slum of Bangalore stated that the various psychosocial factors which are associated with depression in the elderly include stressful life events, loneliness, poor social/family support, isolation, dependency, lack of family care, and, insufficient time spent with children.[20]

Table 3: Association of socio demographic factors with depression among study subjects.

Socio- demographic variables		Depression		Chi square	P value
		Yes	No		
Age (years)	35-44	1	21	113.6	<0.00001
	45-54	7	60		
	55-64	44	86		
	65-74	67	32		
	75-84	29	0		
	85-94	3	0		
Gender	Male	43	57	0.0011	0.486
	Female	108	142		
Education	Literate	38	74	9.508	0.002
	Illiterate	118	125		
Occupation	Employed	9	15	0.334	0.281
	Unemployed	142	184		
Type of work	Heavy work	0	1	8.449	0.014
	Light work	26	15		
	Moderate work	125	183		
Marital status	Divorced	0	1	11.07	0.011
	Married	85	144		
	Unmarried	2	2		
	Widow	64	52		
Socio-economic status	Upper (I)	0	0	9.545	0.022
	Upper middle (II)	2	7		
	Lower middle (III)	15	25		
	Upper lower (IV)	67	109		
	Lower (V)	67	58		
Sleep pattern	Disturbed	100	90	15.26	0.00004
	Normal	51	109		
Addiction history	Present	91	35	67.87	<0.000001
	Absent	60	164		
History of loneliness	Yes	137	99	65.65	<0.000001
	No	14	100		
History of financial dependence on family members	Yes	136	167	2.79	0.047
	No	15	32		
History of lack of family care/caregivers	Yes	132	161	2.671	0.05
	No	19	38		

Limitations

Patients with co-existing morbidities especially non-communicable diseases was considered based only on history and medical records, but investigations will not be done for the same e.g., diseases like cardiovascular diseases such as stroke and heart attacks, cancers, chronic respiratory diseases such as chronic obstructive pulmonary diseases and asthma, CKD, cataract, Alzheimer disease, osteoporosis, and osteoarthritis.

The total population of the urban slum was expected to be high so the study sample was taken according to the prevalence of depression among hypertensives in the general population. So in the current study the proportion of depression only depicts the there is need for a community screening of hypertension and depressive symptoms among them, in that particular urban slum area, and necessary referral services provided who had more depressive symptoms among hypertensives and further management and follow-up.

CONCLUSION

Regular screening for hypertension along with mental health survey is necessary for the urban slum area. Adequate control of blood pressure along with awareness among primary care physicians in identifying those with hypertension and co-morbid depression is essential. 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, especially in hypertensive females.

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