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Iron Deficiency Anemia in Patients with Depression and Somatoform Disorder

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ABSTRACT

The number of persons with common mental disorders globally is going up, particularly in lower-income countries. The risk is increased by poverty, unemployment, life events, physical illness and problems caused by alcohol and drug use. Depression and somatoform disorders are common mental disorders (CMD). Many researchers have found association of iron deficiency anemia and various psychiatry disorders. This hospital based, cross sectional, observational study was conducted at the outpatient department of psychiatry, Nandkumar Singh Chouhan Government Medical College Khandwa, a tertiary care centre east Nimar region of Madhya Pradesh, India over a period of 6 months from June 2022 to November 2022. We selected sample of 60 patients diagnosed with depression and 60 patients diagnosed with somatoform disorder were studied for their socioeconomic profile and anemia. A total of 120 patients, 60 patients with depression and 60 patients with somatoform disorder were studied. Majority of the patients with somatoform disorder and depression both were of 31-45 age group followed by 46-60 years age group. Females, married participants, unemployed, rural background, from low socioeconomic status predominated. Among patients with somatic symptoms 48.33% had anemia and in the depression group 43.33% were anemic. We found statistically significant difference between anemia and severity of somatic symptoms. Both depression and somatoform disorders are common among females, middle and old adults, married, unemployed, rural background, from low socioeconomic status, with less education. In both the disorders majority are patients with mild to moderate symptoms, hence use of screening tools at community level will help identifying these individuals who actively do not seek psychiatric consultation. In reference to anemia, among patients with both these disorders almost half were anemic. It is imperative to keep this in mind while managing psychiatry patients especially in India, where iron deficiency and common mental disorders are highly prevalent.

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Key Words
Depression, somatoform disorder, iron deficiency anemia, PHQ-9, PHQ-15

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INTRODUCTION

As per WHO, the global prevalence of mental disorders is reported to be 22% but the numbers are believed to be higher[1]. At a global level, over 322 million people are estimated to suffer from depression, equivalent to 4.4% of the world's population. Nearly half of these people live in the South-East Asia Region and Western Pacific Region. The number of persons with common mental disorders globally is going up, particularly in lower-income countries, because the population is growing and more people are living to the age when depression and anxiety most commonly occurs. The risk is increased by poverty, unemployment, life events, physical illness and problems caused by alcohol and drug use.

Depression and somatoform disorders are common mental disorders (CMD). Somatoform Disorder (SD) is known to cause disability and impact the quality of life due to psychological and somatic distress. Though it is a common mental disorder, the disorder tends to visit all levels of health care, among which prevalence of SD at tertiary care is 10.1%[2]. Similarly depression is a health burden, more common in women, in subjects from poor economic background with poor nutritional status[3,4].

Iron deficiency is the most common mineral deficiency in the world. According to the World Health Organization (WHO), approximately 25% of the global population is anemic and nearly one-half of those cases are the result of iron deficiency[5,6]. Research shows the importance of iron to proper brain function. Specifically, iron is a necessary cofactor in the enzymes tryptophan hydroxylase and tyrosine hydroxylase, which produce serotonin, dopamine and norepinephrine[7]. Many researchers have found association of iron deficiency anemia and various psychiatry disorders such as depression[8,9-15], anxiety[10,13-15], somatoform disorders[13], sleep disorders[12] and psychotic disorders[12-14] and many more.

The relationship between anemia and psychiatric diseases is known for a long period of time. However, there are only a limited number of studies investigating anemia in patients with depression and somatoform disorders which usually present with physical complaints, hence many a time get missed. Thus, our study aims to examine the anemia among patients with depression and somatoform disorders in relation to their sociodemographic and clinical factors and association between them.

MATERIALS AND METHODS

This hospital based, cross sectional, observational study was conducted at the outpatient department of psychiatry, Nandkumar Singh Chouhan Government Medical College Khandwa, a tertiary care centre east Nimar region of Madhya Pradesh, India over a period of 6 months from June 2022 to November 2022.

The study was conducted in the psychiatry outpatient department. We selected sample of 60 patients diagnosed with depression and 60 patients diagnosed with somatoform disorder (ICD-10). It was convenience sampling, where we included every subsequent participant as per inclusion and exclusion criteria.

Inclusion criteria: From June 2022 to November 2022, both male and female patients aged between 18 and 60 years, with presenting symptoms of depression or somatoform disorder, who gave their consent to participate in the study were included. Patients with other psychiatry diagnosis, medical or surgical illness and pregnancy were excluded from the study. A semi structured proforma was used for demographic details.

All participants were assessed using the screening and diagnostic tool for depression (PHQ-9) and somatoform disorder (PHQ-15). Participants scoring more than cut off in both the scales, were finally recruited for the study. The PHQ-9 is a multipurpose instrument for screening, diagnosing, monitoring and measuring the severity of depression. It is brief and useful in clinical practice, can be completed by the patient in minutes and is rapidly scored by clinician. It has nine items to assess depression. PHQ-9 scores equal or more than 10 has sensitivity of 88% and specificity of 88% for Major depression. Similarly PHQ-15 has 15 items to assess somatic symptoms like "Stomach pain", "Back pain", "Feeling tired or having little energy", "Headaches" etc. Each item has three possible answers from "not bothered" score 0 to "Bothered a lot" score 2. The cut off score of PHQ-15 is 5. The total score of PHQ-15 is classified into mild (equal or more than 5), moderate (equal or more than 10) and severe (equal or more than 15). PHQ-9 score is classified into mild (5-9), moderate (10-14), moderately severe (15-19) and severe (20-27).

For assessment of iron deficiency anemia, blood samples of the patients were collected and analyzed at institutional laboratory and diagnostics centre. We measured CBC using fully automated hematology analyzer. Venous blood samples were collected in EDTA anticoagulant vial and CBC estimation was done and results were noted.

Recorded data was tabulated and analyzed: The obtained results were tabulated and statistical analysis was done using SPSS v26 (Statistical Package for social sciences). Qualitative data variables were expressed using frequency and Percentage. Chi-square test was used to find the association between variables. Significance levels for all analyses were set at the $p<0.05$.

RESULTS

A total of 120 patients, 60 patients with depression and 60 patients with somatoform disorder were studied. Majority of the patients with somatoform disorder (46.66%) were of 31-45 age group followed by 46-60 years age group (35%). Females (63.33%), married participants (68.33%), unemployed (61.66%), rural background (71.66%) from low socioeconomic status (56.66%) predominated. In education, majorities were illiterates (43.33%) and educated till primary (23.33%).

Similarly, among patients with depression, (40.00%) were of 31-45 age group followed by 46-60 years age group (38.33%). Here also females (55.00%), married participants (55.00%), unemployed (60.00%), rural background (65.00%) from low socioeconomic status (51.66%) predominated. In education, majorities were illiterates (28.33%) and educated till primary (21.66%). There was no statistically significant difference found between these parameters. The socio-demographic variables of our study population are recorded in Table 1.

Among patients with somatic symptoms 41.66% had mild, 30% moderate and 28.33% severe scores in PHQ-15. In the depression group 40.00% had mild, 28.33% moderate, 18.33% moderately severe and 13.33% severe depression as assessed and scored by PHQ-9. On comparing the score and severity of depression and somatic symptoms between males and females, no statistically significant difference was found. The severity of somatic symptoms and depression between both genders are presented in Table 2.

Among patients with somatic symptoms 48.33% had anemia and in the depression group 43.33% were anemic. We found statistically significant difference between anemia and severity of somatic symptoms. The distribution of anemia among depressed and somatoform patients are presented in Table 3 and Fig. 1 and 2.

Table 1: Socio-demographic variables of patients

	Somatic		Depression		
Socio-demographic profile	Number (N = 60)	Percentage	Number (N = 60)	Percentage	p-value
Age (in years)					
18-30	11	18.33	13	21.66	0.75
31-45	28	46.66	24	40.00	
46-60	21	35.00	23	38.33	
Gender					
Male	22	36.66	27	45.00	0.35
Female	38	63.33	33	55.00	
Residence					
Urban	17	28.33	21	35.00	0.43
Rural	43	71.66	39	65.00	
Education					
Illiterate	26	43.33	17	28.33	0.24
Primary	14	23.33	13	21.66	
Secondary	9	15.00	10	16.66	
High school	7	11.66	9	15.00	
Graduate or higher	4	6.66	11	18.33	
Socio-economic class					
Low	34	56.66	31	51.66	0.73
Middle	18	30.00	22	36.66	
Upper	8	13.33	7	11.66	
Working status					
Employed	23	38.33	24	40.00	0.85
Unemployed	37	61.66	36	60.00	
Marital status					
Unmarried	19	31.66	27	45.00	0.13
Married	41	68.33	33	55.00	

Table 2: Severity of somatic symptoms and depression between male and female patients

	Severity	Total (n = 60)	Male (n = 22) (36.66%)	Female (n = 38) (63.33%)	p-value
PHQ-15 score (somatic symptoms)	Mild (5-9)	25 (41.66%)	11	14	0.39
	Moderate (10-14)	18 (30.00%)	7	11	
	Severe (>15)	17 (28.33%)	4	13	
		Total (n = 60)	Male (n = 27) (45.00%)	Female (n = 33) (55.00%)	p-value
PHQ-9 score (depression)	Mild (5-9)	24 (40.00%)	11	13	0.97
	Moderate (10-14)	17 (28.33%)	9	8	
	Moderately severe (15-19)	11 (18.33%)	4	7	
	Severe (20-27)	8 (13.33%)	3	5	

Table 3: The distribution of anemia among depressed and somatoform patients

PHQ-15 score (somatic symptoms)	Severity	Total (n = 60)	Anemic (n = 29) (48.33%)	Non-anemic (n = 31) (51.66%)	p-value
	Mild	25 (41.66%)	17	8	0.016
	moderate	18 (30.00%)	8	10	
	severe	17 (28.33%)	4	13	
		Total (n = 60)	Anemic (n = 26) (43.33%)	Non-anemic (n = 34) (56.66%)	p-value
PHQ-9 score (depression)	mild	24 (40.00%)	10	14	0.76
	moderate	17 (28.33%)	8	9	
	Moderately severe	11 (18.33%)	3	8	
	severe	8 (13.33%)	5	3	

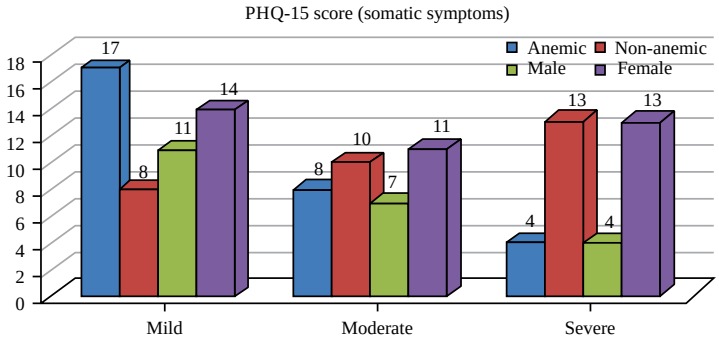

Fig. 1: Distribution of anemia among somatoform patients

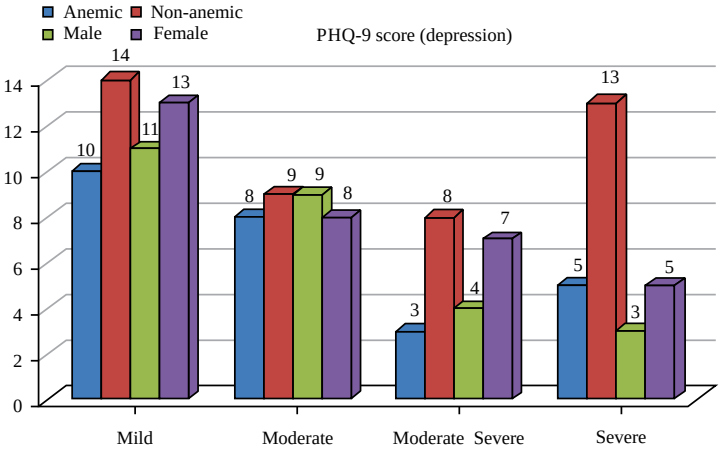

Fig. 2: Distribution of anemia among patients with depression

DISCUSSIONS

We conducted the study with the aim of investigating the hematological problem in patients of depression and somatoform in India. As per WHO Global Health Estimates, 2017 CMD are very common and so is iron deficiency anemia. Anemia impacts an estimated 24.8% of the world i.e., about 1.62 billion people. The most prevalent cause of anemia in the world is iron deficiency[16]. We found most studies of depression and anemia but a few of somatoform disorders.

A total of 120 patients, 60 patients with depression and 60 patients with somatoform disorder were studied and compared. Majority of the patients with somatoform disorder (46.66%) were of 31-45 age group followed by 46-60 years age group (35%). Females (63.33%), married participants (68.33%), unemployed (61.66%), rural background (71.66%) from low socioeconomic status (56.66%) predominated. In education also, majorities were illiterates or educated till primary.

It is similar to the findings by Chander *et al*.[2]. Authors studied 400 patients, at NIMHANS, a quaternary mental health centre, India, to find prevalence and correlates of somatization disorder. The significant correlates observed were median age of 40.5 years, female, married, <5 years of education, monthly income of < 10,357(85.5%) and lower socioeconomic status (75%). They postulated poverty to be a major contributing factor to Somatoform disorder[2].

Similarly Babu AR (2019) did a cross sectional study among 1210 adult women of Kochi, Kerala in 2016-2017, using PHQ-15 and GAD-7, to find prevalence and determinants of somatization and anxiety. They found 40.8% had somatization. Most were married (77.7%), with a mean age of 45.24±15.59[17].

Among patients with depression also, findings were similar. About 31-45 age group comprised most of the patients (40.00%) and next came 46-60 years age group (38.33%). Here also females, married, unemployed, from rural background and low

socioeconomic status predominated. However there was no statistically significant difference found between these variables among depressed or somatoform patients. As per, National Mental Health Survey of India, across 6 regions and 12 states of India during 2015-16, older adults have been found to have a higher lifetime and current prevalence of depressive disorders as compared to the younger adults. These are more common in females, unemployed and lower socioeconomic status. Contrastingly, they found it common among unmarried and from urban background[18]. Similar finding have been reported by Grover *et al*.[3].

Among patients with somatic symptoms 41.66% had mild, 30% moderate and 28.33% severe symptoms. In the depression group 40.00% had mild, 28.33% moderate, 18.33% moderately severe and 13.33% severe depression. This is likely due to the fact that patients with mild symptomatology are often missed or underdiagnosed and not seek active psychiatric consultation but with the help of screening tools they can be identified. On comparing the score and severity of depression and somatic symptoms between males and females, no statistically significant difference was found.Researchers have found high prevalence of somatic symptoms among depressed and some studies report that somatic symptoms are the most common manifestation of depression in India[3,19].

In reference to anemia, among patients with somatic symptoms 48.33% had anemia and in the depression group 43.33% were anemic. We found statistically significant difference between anemia and severity of somatic symptoms.

In a recent study by Ahmed *et al*.[20] of 1447 elderly participants (97 were with depression) authors found that 10.7% of major depression and 11.1% of minor depression patients had anemia[20]. In a web survey by Hidese et al, of 11,876 adults, an association between a self-reported history of iron deficiency anemia and a self-reported history of depression was found[9]. Stewart *et al*.[9] in their survey of 1,875 older adults in England, found an association between low ferritin levels (<45 ng mL^{-1}) and depressive symptoms after adjusting for demographic factors and overall health status[10]. In an analysis of the Taiwan National Health Insurance Database from 2000 to 2012, authors found a statistically significant increased risk of depression, anxiety disorders, sleep disorders and psychotic disorders in patients with iron deficiency anemia[12]. Korkmaz *et al*.[14] in their study of anemia in chronic psychiatry patients reported anemia in 22% of depressive disorder patients[14]. Vanishri A also observed higher levels of depression, anxiety and stress and decreased spatial memory scores in females with iron deficiency anemia[10]. Shafi *et al*.[11] concludes that there is relationship between iron deficiency anemia and depressive disorder and severity of symptoms of DD increases with degree of IDA[11].

In a recent study by Nageen *et al*.[13], of anemia in Chronic Psychiatric Disorders, the overall frequency of anemia in patients suffering from psychiatric disorders was 61.2%. Among the anemic patients, depression was present in 63.6% and somatoform disorders in 62.5%[13].

CONCLUSION

Both depression and somatoform disorders are common among females, middle and old adults, married, unemployed, rural background, from low socioeconomic status, with less education. In both the disorders majority are patients with mild to moderate symptoms, hence use of screening tools at community level will help identifying these individuals who actively do not seek psychiatric consultation. In reference to anemia, among patients with both these disorders almost half were anemic. Iron plays a significant role in brain functioning and some studies have mentioned its role in treatment also. It is imperative to keep this in mind while managing psychiatry patients especially in India, where iron deficiency and common mental disorders are highly prevalent.

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