

The Co-Existence of Anaemia in Chronic Psychiatric Disorders: A Study at Tertiary Care Hospital

Zaib un Nisa, Ayesha Nageen, Sidrah Tauheed, Jamal Ara

Cannt General Hospital, Rawalpindi Pakistan

ABSTRACT

Objective: to study the frequency of anaemia in various chronic psychiatric disorders in an adult population.

Study Design: Cross-sectional study.

Place and study duration: Creek General Hospital, Karachi Pakistan, from Feb to May 2021.

Methodology: Two hundred and six patients were enrolled in the outpatient clinics after informed consent. Adult patients of 18 to 50 years who were clinically diagnosed with a psychiatric disorder by a certified psychiatrist and had no organicity were included in the study. Anaemia was defined as haemoglobin less than 13 gm/dl for males and less than 12 gm/dl in females. The severity of anaemia was classified into mild, moderate and severe according to the haemoglobin range by WHO criteria. The type of anaemia was categorized into microcytic, normocytic and macrocytic according to the value of mean corpuscle volume.

Results: The overall frequency of anaemia in patients suffering from psychiatric disorders was 126 (61.2%) out of 206 persons. Among the anaemic, 20 (58.8%) had schizophrenia; depression was present in 35 (63.6%), generalized anxiety disorder in 39 (57.4%), somatoform disorders in 20 (62.5%) and 12 (70.6%) in bipolar subjects. Among those who were anaemic, a normocytic value was found in 28 (13.6%) adults, microcytic in 95 (46.0%) patients and macrocytic in 4 (1.9%). The severity of anaemia among anaemic was highest in the mild group. Sixty-nine males (53.6%) and 89 females (65%) were anaemic. ($p=0.078$). Anaemia was found highest in the 40-50 years age group.

Conclusion: Anaemia was frequently found in adults suffering from chronic psychiatric disorders.

Keywords: Anaemia. Haemoglobin, Psychiatric disorders.

How to Cite This Article: Nisa ZU, Nageen A, Tauheed S, Ara J. The Co-Existence of Anaemia in Chronic Psychiatric Disorders: A Study at Tertiary Care Hospital. *Pak Armed Forces Med J* 2022; 72(4): 1310-1313. DOI: <https://doi.org/10.51253/pafmj.v72i4.7205>

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<https://creativecommons.org/licenses/by-nc/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Mental health has a significant role in living a peaceful life in this fast-paced world. The occurrence of mental disorders among all age groups continues to grow, resulting in grave consequences for personal, social, economic and global prosperity. Rancans *et al.* states that the negativity that mental diseases harbour has a potential bearing on the quality of life, functionality, health-related work loss and increased health-care cost leading to a higher rate of disability and morbidity.¹

According to WHO, the global prevalence of mental disorders (depression, anxiety, post-traumatic stress disorder, bipolar disorder, and schizophrenia) is reported to be 22%,² but the numbers are believed to be higher. The World Health Organization (WHO) states that major depression and schizophrenia have a 40-60% greater probability of pre-mature death due to unattended health issues and suicide. Korkmaz *et al.* have shown an association between psychiatric disorders and the high prevalence of anaemia.³ Anaemia can exacerbate the psychiatric condition of the patient

and vice versa. There is growing indication that iron has a part in developing neurological function and brain development, as seen by a 2020 study.⁴ Iron deficiency anaemia causes poor myelination in the brain and impairment of monoamine metabolism. It also affects the homeostasis of glutamate and γ -aminobutyric acid (GABA), leading to deficits in memory, learning, and behaviour ending in emotional, psychological and cognitive problems and suicidal tendencies, which were printed by a Turkish study.⁵ Stefan discussed the psychopathology association with B₁₂ deficiency with cognitive, psychiatric and neurological functions.⁶ Wolffenbutter explicated that the common psychiatric symptoms with cobalamin deficiency were organic brain syndrome, depression, mania, psychosis, etc.⁷ Sodawat *et al.* warned that neuropsychiatric clinical features could represent cobalamin deficiency even before the symptoms of anaemia.⁸

Finding the frequency of anaemia in chronic psychiatric patients and analyzing the sociodemographic factors that could play a role in the occurrence of anaemia would help clinicians manage a patient for the overall well-being, which includes psychiatric issues and anaemia correction.

Correspondence: Dr Ayesha Nageen, 171/1 16th Street Khayaban e Iqbal Phase 8 DHA Karachi, Pakistan

Received: 09 Aug 2021; revision received: 08 Oct 2021; accepted: 27 Oct 2021

Anaemia can aggravate psychiatric disorders, so with the help of this study, physicians and psychiatrists would be able to work in collaboration for a better prognosis for the patient. Hence, the correction of anaemia is pertinent for the complete overall management of a patient suffering from psychiatric disorders.

METHODOLOGY

This cross-sectional study was conducted in the Creek General Hospital, Karachi Pakistan, from February to May 2021, after approval from the IRB/REC Committee (reference#: UMDC/Ethics/IRB2021/15/06/280). The sample size was 206, calculated by the Raosoft calculator with reference to the last local study.³ After informed consent, the patients were enrolled on the medicine and psychiatry department outpatient clinics. We implied the consecutive sampling technique.

Inclusion Criteria: Adult patients of 18 to 50 years who were clinically diagnosed with a psychiatric disorder by a certified psychiatrist were included in the study.

Exclusion Criteria: Psychiatric patients with known organicity were excluded from the study.

A structured proforma was created for demographic details. Clinical interview of included subjects was conducted to identify psychiatric disorders in accordance with the ICD 10 criteria.⁹ The blood samples of the patients were sent to the Laboratory and Diagnostics Centre of Creek General Hospital. An automatic counting machine then calculated complete blood counts (CBC); According to WHO criteria, the presence of anaemia and its severity and type were documented.¹⁰

Anaemia was present if the haemoglobin was less than 13gm/dl in males and less than 12 gm/dl in females. The severity of anaemia was mild in males with haemoglobin of 10-12.9 gm/dl and females with haemoglobin of 10 to 11.9 gm/dl. Moderate and severe anaemia was labelled when the haemoglobin range was 8-9.9 gm/dl or less than 8 gm/dl, respectively (in both genders).¹¹

Regarding the type of anaemia, microcytic anaemia was when the mean corpuscular value(MCV) was less than 84 fl. It was normocytic with an MCV value of 84-96 fl and macrocytic when the MCV value was greater than 96 fl.¹²

Statistical Package for Social Sciences (SPSS) version 23.0 was used for the data analysis. Quan-

titative variables were summarized as Mean±SD and qualitative variables were summarized as frequency and percentages. Chi-square test was applied to find out the association. The *p*-value lower than or up to 0.05 was considered as significant.

RESULTS

We recruited 206 patients, of which the males in our study were 69 and the females 137. There were 87 (42.0%) in the younger age group [18-30 years], 70 (34.0%) in the middle age group [30-40 years] and 49 (23.8%) in the elder group [40-50 years]. The mean age was 33.14±9.8 years, ranging from 18 to 50 years. The mean haemoglobin was 11.55±2.07 gm/d, ranging from 5.70 to 16.50 gm/dl. The mean MCV value was 80.64±8.9 fl, ranging from 52 to 121 fl.

In the study, those who had schizophrenia were 16.5%, depression was found in 55 (26.7%), GAD was in 68 (33%), somatoform disorders were present in 32 (15.5%), and bipolar patients were 17 (8.3%). The overall frequency of anaemia in patients suffering from psychiatric disorders was 126 (61.2%) out of 206 persons (Table-I).

Table-I: Anaemia in Different Chronic Disorders (n=206)

Psychiatric Disorders	Anaemia		<i>p</i> -value
	Present n (% within the psychiatric disorder)	Absent n (% within the psychiatric disorder)	
Schizophrenia	20 (9.7)	14 (6.8)	0.862
Depression	35 (17.0)	20 (9.7)	
Generalized Anxiety Disorder	39 (19.0)	29 (14.2)	
Somatoform	20 (9.7)	12 (5.8)	
Bipolar	12 (5.8)	5 (2.3)	

Among those who were anaemic, a normocytic value was found in 28 (13.6%) adults, microcytic in 95 (46.0%) patients and macrocytic in 4 (1.9%) (Table-II). The frequency of severity of anaemia among anaemic was 78 (38%) in the mild group, 42 (20.4%) in the moderate group and severe in 6 (3.0%) (Table-III).

Out of the 69 males, 37 (53.6%) had anaemia, and 65% of females were anaemic. (*p*=0.078). In the age group of 18-30 years, 48 (55.2%) were anaemic, among the adults aged 31-40 years, 43 (61.4%) were anaemic, and in the 40-50 years age group, 35 (71.4%) had anaemia. (*p*=0.175). Among the 66 unemployed, 38 (57.6%) were anaemic, while among the 60 employed, 32 (53.3%) had anaemia and 56 (70%) out of 80 homemakers were anaemic. (*p*=0.104). Among the 129

married patients, 81 (62.8%) were anaemic, and anaemia was present in 45 (58.0%) of the total 77 single adults ($p=0.318$). Anaemia frequency for socioeconomic status was displayed in Table-IV.

Table-II: Type of Anaemia In Different Chronic Disorders with Anaemia (n=206)

Psychiatric Disorders	Type of Anaemia			p-value
	Normocytic; Frequency (% Within the Psychiatric Disorder)	Microcytic; Frequency (% Within the Psychiatric Disorder)	Macrocytic; Frequency (% Within the Psychiatric Disorder)	
Schizophrenia (n=20)	6 (30)	14 (70)	0(0)	0.167
Depression (n=35)	7 (20)	28 (80)	0(0)	
Generalized Anxiety Disorder (n=39)	7 (18)	28 (72)	4 (10.3)	
Somatiform (n=20)	3 (15)	17 (85)	0(0)	
Bipolar (n=12)	4 (33)	8 (66)	0(0)	

Table-III: Severity of Anemia In Psychiatric Disorders With Anemia.

Psychiatric Disorders	Type of Anemia			p-value
	Mild n=78 (% Within the Psychiatric Disorder)	Moderate n=42 (% within the Psychiatric Disorder)	Severe n= 6 (% Within the Psychiatric Disorder)	
Schizophrenia (n=20)	13 (65)	7 (35)	0(0)	0.030
Depression (n=35)	18 (51)	11 (31)	6 (17)	
Generalized Anxiety Disorder (n=39)	27 (69)	12 (31)	0(0)	
Somatiform (n=20)	12 (60)	8 (40)	0(0)	
Bipolar (n=12)	8 (66)	4 (33)	0(0)	

Table-IV: Anaemia Frequency with Respect to Socioeconomic Status (n=206)

Socioeconomic Status	Anaemia n(%)		p-value
	Present	Absent	
Low Socioeconomic Status (n=138)	84 (60.9)	54 (39.1)	0.016
Middle Socioeconomic Status (n=56)	39 (69.6)	17 (30.4)	
Upper Socioeconomic Status (n=12)	3 (25%)	9 (75%)	

DISCUSSION

Our study gave an insight into the haematological aspect of patients with a psychiatric disorder and confirmed the findings of other studies that the presence of anaemia needs to be ruled out for an optimal outcome for the patient. Unsurprisingly, females presented more commonly with anaemia, as per the Korkmaz *et al.* study conducted on a population of different cultural backgrounds where 35% of females were anaemic.³ Females have a higher risk of comorbid anaemia with diagnosed psychiatric illness. In our society, females present late for health care management due to general negligence towards their wellbeing. Subjects above 50 years were not included in this study this age group. Anaemia could exist due to other geriatric conditions. Anaemia was higher in the patients in the age bracket of 40 to 50 years in this research which agrees with Onder *et al.* study on elders in which anaemia was frequent in 15% of depressed patients.¹¹ One of the most significant demographic factors is the socioeconomic status as understandably anaemia is prevalent in the lower socioeconomic group. The considerable patient population of our study was from a lower socioeconomic background, which can be an added factor to the high prevalence of anaemia. This is analogous to a study done in Turkey, where 32% of the affected population is from a lower socioeconomic group.³ Lack of privileges and poverty are common factors between anaemia, depression and anxiety. A Netherland prospective mega study on depressed and anxious people showed an initial lower haemoglobin level in them which, after adjustment for sociodemographics, disease indicators and lifestyle improved.¹²

A significant sum of participants with psychiatric illness was found to be anaemic. Anaemia can aggravate their general condition and vice versa. Hence, a coordinated approach is needed for optimal patient management to improve the overall quality of life and reduce morbidity. Out of diagnosed psychiatric patients, our findings stated that patients with psychotic disorders including schizophrenia and bipolar affective disorder are slightly more anaemic. Korkmaz *et al.* reported anaemia in 35% of the psychotic disorder patients and 25% with bipolar affective disorders.³ Depressive disorder is among the most common mental disorder. According to a WHO report of 2018, 322 million of the population are affected with depressive disorder, and nearly half of that population belongs to South East Asia and Western Pacific

region.¹³ Our study, as well as another Pakistani study,¹⁴ found 73% were anaemic, reflects the higher percentage of anaemia in depression which in comparison to the 2015 research, which showed a progressive trend in depression and anaemia association. More patients suffering from GAD and somatization disorder were anaemic, implying that their management of psychiatric disorders only will not be sufficient, and a complete health workup is required.

The severity of anaemia present with psychiatric diseases was generally of a mild intensity emphasizing that an iron and Cobalamin-rich diet and supplement intake would be sufficient for having healthy individuals. Most participants were suffering from the microcytic anaemia. Hence iron deficiency anaemia, which is relatable to Indian research that confirmed iron deficiency anaemia has a higher incidence of depression and anxiety in women.¹⁵ A Japanese data displayed anaemia to be 7.2% in depressed men compared to a lesser value in controls.¹⁶ Although Vitamin B12 and folate deficiency contribute to the manifestation of mood disorders, we found fewer populations here with macrocytic anemia.^{16,17} Generally, individuals in our community are not primarily vegetarian and may not be naturally deficient in Cobalamin. A Chinese mega trial indicated that a regular supplement of micronutrients relieves anaemia and anxiety.¹⁸

Our study reflects the significant presence of anaemia in patients with psychiatric disorders, and it reflects the significance of a collaborative approach in managing patients to improve quality of life and prevent disability caused by mental health problems.

The strength of our study was involving patients with multiple mental health disorders diagnosed by mental health experts and that the study was done in a tertiary care setting with diversified cultural and ethnic backgrounds.

LIMITATIONS OF STUDY

Detailed workups, like iron profile, B12 and folate levels, were advised to the patients to confirm the cause of the type of anaemia, but limitations were present due to cost and affordability in the unprivileged sector. It is recommended to have ongoing research on this topic in a multi-centric setting and further investigate the cause of anaemia.

CONCLUSION

Anaemia was significantly found in various chronic psychiatric disorders in the adult population.

Conflict of Interest: None.

Author's Contribution

ZUN: Data collection and manuscript writing, AN: Manuscript writing, ST: Data collection, JA: Supervising.

REFERENCES

- Rancans E, Renemane L, Kivite-Urtane A. Prevalence and associated factors of mental disorders in the nationwide primary care population in Latvia: a cross-sectional study. *Ann Gen Psychiatr* 2020; 19(1): 25-28.
- Fiona C, Mark O, Abraham F, Joseph C, Whiteford SS. New WHO prevalence estimates of mental disorders in conflict settings: a systematic review and meta-analysis. *Lancet* 2019; 394(10194): 240-248.
- Korkmaz S, Yildiz S, Korucu T. Frequency of anemia in chronic psychiatry patients. *Neuropsychiatr Dis Treat* 2015; 11: 737-2741
- Lee HS, Chao HH, Huang WT. Psychiatric disorders risk in patients with iron deficiency anemia and association with iron supplementation medications: a nationwide database analysis. *BMC Psychiatr* 2020; 20: 16
- Abdurrahman CÖ, İlknur U, Nergiz OB, GulcihanOzek, Vahdet G. Prevalence of psychiatric disorders and suicidality among children and adolescents with thalassemia major-A Turkish sample. *Childrens Health Care* 2019; (48)1: 120-129.
- Markun S, Gravestock I, Jäger L, Rosemann T, Pichierri G. Effects of Vitamin B12 Supplementation on Cog-nitive Function, Dep-ressive Symptoms and Fatigue: A Systematic Review, Meta-Analysis, and Meta-Regression. *Nutrients* 2021; (13): 23-26.
- Wolffenbuttel BHR, Wouters HJCM, Heiner-Fokkema MR, van- der Klauw MM. The Many Faces of Cobalamin (Vitamin B12) Deficiency. *Mayo Clin Proc Innov Qual Out* 2019; 3(2): 200-214.
- Sodawat R, Kumar N. A prospective cross sectional study of prevalence of neuropsychiatric manifestations in adolescents with vitamin B 12 deficiency anemia. *Int J Med Sci Educ* 2019; 6(3): 51-56.
- Sartorius N. World Health Organization, The diagnostic criteria of major depression as defined by the ICD-10 classification of mental and behavioural disorders World Health Organization, Geneva, 1992, [Internet] available at: <https://www.who.int/classifications/icd/en/bluebook.pdf> [Accessed on Feb 28, 2021].
- WHO. Hemoglobin concentrations for the diagnosis of anemia and assessment of severity. Vitamin and Mineral Nutrition Information System. Geneva, World Health Organisation, 2011, [internet] available at: https://apps.who.int/iris/bitstream/handle/10665/85839/WHO_NMH_NHD_MNM_11.1_eng.pdf [Accessed on Feb 28, 2021].
- Onder G, Pennix B, Cesari M, Bandinelli S, Lauretani F. Anemia Is Associated With Depression in Older Adults: Results From the InCHIANTI Study. *J Gerontol A Biol Sci* 2005; 60(9): 1168-1172.
- Lever-van Milligen BA, Vogelzangs N, Smit JH, Penninx BW. Hemoglobin levels in persons with depressive and/or anxiety disorders. *J Psychosom Res* 2014; 76(4): 317-321.
- Vos T. Global, regional, and national incidence prevalence, and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990-2017: a systematic analysis for the Global Burden of Disease Study 2017. *Lancet* 2018; 392(1): 1683-2138.
- Madiha S, Fatima T, Humaira M. Relation between Depressive Disorder and Iron Deficiency Anemia among Adults Reporting to a Secondary Healthcare Facility: A Hospital-Based Case Control Study. *J Coll Physicians Surg Pak* 2018; 28(6): 456-445
- Ashok V, Kumar A, Singh RSA. Depression, anxiety, stress and cognition in females with Iron deficiency anemia. *Trop J Pathol Microbiol* 2017; 3(2): 2456-2487
- Hidee S, Saito K, Asano S, Kunugi H. Association between iron-deficiency anemia and depression: A web-based Japanese investigation. *Psychiatry Clin Neurosci* 2018; 72(7): 513-521.
- Sangle P, Sandhu O, Aftab Z, Anthony AT, Khan S. Vitamin B12 Supplementation: Preventing Onset and Improving Prognosis of Depression. *Cureus* 2020; 12(10): e11169.
- Linxiu Z, Max KW, Renfu , Yaojiang S. Multiple Micronutrient Supplementation Reduces Anemia and Anxiety in Rural China's Elementary School Children. *J Nutr* 2013; 143(5): 640-647.