

**Original Article**

**A RETROSPECTIVE STUDY OF THE PREVALENCE OF DEPRESSION DUE TO LOW HAEMOGLOBIN COUNT**

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*Received: 05 Nov 2021, Revised and Accepted: 10 Jan 2022*

**ABSTRACT**

**Objective:** It has been shown that low haemoglobin count is associated with psychological consequences and psychiatric morbidity. The association between low haemoglobin count and psychological depression has not been properly interpreted with standard values. Hence the purpose of this pilot study is to know whether there is a relation between the haemoglobin levels and the risk of developing psychiatric disorders and morbidities.

To find out if there is any relationship between low haemoglobin count and depression in a rural healthcare setup.

**Methods:** Patients from the Psychiatry Department in Saveetha Medical College and Hospital were taken. Adults over the age of 18 were included. The period between the months September 2020 and July 2021. The primary outcome was the diagnosis of psychiatric depression and their associated blood haemoglobin values.

**Results:** Among the other types of psychiatric disorders, the female patients with low haemoglobin count were associated with a significantly higher incidence of anxiety disorders, depression and adjustment disorders. Furthermore, patients with normal haemoglobin levels were associated with a significantly lower risk of psychiatric morbidities.

**Conclusion:** The undergone study indicates that patients with psychiatric disorders such as depression, adjustment disorders and anxiety are related with significantly low haemoglobin counts in women and not in men.

**Keywords:** Depression, Anaemia, Haemoglobin count, Low haemoglobin, Ham D score, Anaemia effects, Anti-depressants

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**INTRODUCTION**

Anaemia is common disease in our country. It has many reasons as to why it's caused. From worm infestations in children to excessive menstruation in women, frequent childbirth, increased adherence of haemorrhoids in both men and women, etc. All these cause an increased prevalence of anaemia. Most of anaemia in India is due to iron deficiency anaemia. Iron is not only used in transport of oxygen to the lungs but also in many other enzymatic reactions in our body. That being the reason for oral ulcers, oesophageal ulcers, Plummer Vinson syndrome, mucocouels, diarrrea, decreased absorption of nutrients, delayed wound healing, decreased scholastic behaviour and withdrawn children in school-going age, decreased aptitude, increased absence from school or work, excessive tiredness and easy fatigability. All these are caused only due to low iron in the body. Depression is one of the most commonest psychological effect seen in day-to-day practise [1].

Is there an association between anaemia and depression. There are multiple studies done to answer the question. But because of various populations taken with various inclusion and exclusion criteria, results have been inconsistent and have not thrown a clear picture/idea of the correlation [2]. With this, the aim and objective of this pilot study is to find out whether there is an association between anaemia and depression. If this has a positive outcome, then the next Sep would be to find out whether it is a causal or a non-causal relation.

**MATERIALS AND METHODS**

**Data sources**

This is a retrospective case-control study based on the association of low haemoglobin lab values and psychiatric depression. Clinical and sociodemographic details of the patients were obtained by a register

maintained by the medical record department of SMCH. The data was classified and tabulated in a Microsoft Excel Spreadsheet under appropriate columns.

The study was conducted after obtaining ethical clearance from the Department of Ethics, Saveetha Medical College.

**Study population**

The study population includes patients over 18 y of age and are going through depression. Valid patients will be those who are diagnosed by a psychiatrist with Hamilton Depression Rating Scale (HAM-D Score).

Individuals with missing data and those who were diagnosed without blood tests were excluded. However, in order to confirm the diagnosis of IDA, patients underwent laboratory testing for decreased serum Iron and ferritin, and increased total iron-binding capacity.

**RESULTS**

A total of 196 patients attended the psychiatric department during February-July (6 mo). There were a total of 52 men, in which 12 were with the normal haemoglobin count and there were 40 anaemic men with some grade of depression. Also, there were a total of 8 women with normal haemoglobin range and there were 136 anaemic women with different grades of depression. Grades of depression were calculated according to the Ham D score.

With the data values present, chi-square test showed no significance ( $p=0.07$ ). But in women, chi-square test showed significance ( $p=0.03$ ) in the respective tables, table 1 and table 2.

**DISCUSSION**

Anaemia in India is mostly due to iron deficiency [3]. Iron deficiency not only causes anaemia but also causes multiple defects at the

cellular level [4]. We can see this through clinical presentations of oral ulcers, decreased appetite, increased irritability in children, decreased educational performance and scholastic performance in both young adults and children [5].

Depression is also an outcome of anaemia at a cellular level. This is because iron is not only necessary for haemoglobin, but also for multiple biochemical reactions have iron as a part of it.

The research was done to find out whether there is a significant contribution of iron deficiency in depression [6].

In the study that was conducted, a total of 196 patients were taken considering both inclusion and exclusion criteria. Of the 196 patients, 52 were male and 144 were females. A complete blood

work up had been done to the patients. A cut off haemoglobin count 13.5g/dl in females and 14.5g/dl in males was taken.

In the study done on males, it was found that there were 12 patients with normal haemoglobin count and had different grades of depression. 9 patients had mild depression, 2 had moderate depression and 1 patient had severe depression. Also, there were 40 male patients with low haemoglobin count who suffered depression. 22 suffered mild depression, 15 with moderate depression and 3 with severe depression. Chi square test was done with, taking depression of mild, moderate and severe grades with normal haemoglobin count and anaemic patients. It was found that the p value=0.07 indicating no significance (table 1).

**Table 1: Males patient classification**

	Mild depression	Moderate depression	Severe depression	Total
Normal	9	2	1	12
Anaemic	22	15	3	40
Total	31	17	4	52

Whereas,

In the study done on females, it was found that 8 patients with normal haemoglobin count suffered with depression. Of the 8, 5 were mildly depressed, 2 were moderately depressed and 1 was severely depressed. Also, there were a total of 136 females with low

haemoglobin count who showed symptoms of depression. Of the total 136, 101 had mild depression, 25 had moderate depression and 10 had severe depression. Chi square test was done with, taking depression of mild, moderate and severe grades with normal haemoglobin count and anaemic patients. It was found that there was the p value=0.03 indicating positive significance (table 2).

**Table 2: Females patient classification**

	Mild depression	Moderate depression	Severe depression	Total
Normal	5	2	1	8
Anaemic	101	25	10	136
Total	106	27	11	144

The study hence indicated that there was a significant correlation of anaemia and low haemoglobin count in women [7, 8]. Women generally have more chances of getting anaemic because of multiple reasons like poor nutrition compare to men, increased menstrual blood loss and recurrent childbirth to say a few [9]. All these factors lead to depression. The aim of the study is to find out whether correcting anaemia is an important factor before starting anti-depressants in women [10]. This study shows most of the women with anaemia present with a symptom of depression also [11]. Hence this confounding factor has to be treated before starting on anti-depressant therapy. This is especially applied in mild to moderate depressive patients. But, patients with severe depression or suicidal tendencies definitely need anti-depressants from the beginning [12, 13]. Other depressive patients with cognitive behavioural therapy or with mild anti-depressants with coexisting anaemia must be treated for anaemia before starting them on anti-depressants [14].

#### CONCLUSION

From the above results we can see a statically significant association between the presence of anaemia and depression, especially in women. This association was not seen in men.

#### ACKNOWLEDGEMENT

I sincerely thank the department of psychiatry and the participant medical students for their contribution in research.

#### FUNDING

Nil

#### AUTHORS CONTRIBUTIONS

All the authors have contributed equally.

#### CONFLICT OF INTERESTS

Declared none

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