



ORIGINAL RESEARCH PAPER

General Medicine

PREVALENCE OF ANEMIA IN TYPE 2 DIABETIC PATIENTS

KEY WORDS: Type 2 diabetes; Anemia; Prevalence; Age; Gender; HbA1C

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ABSTRACT

Background: The aim of the study was to determine the prevalence of anemia in patients with type 2 diabetes and to assess the risk of anemia according to gender, age and glycemic control. **Method :** This is a Cross Sectional study of 200 cases of type 2 diabetes mellitus in the General medicine OPD and medicine ward of Jhalawar Medical College Jhalawar from July 2022 to december 2022 All the tests are done with permission from the Institutional Ethical Committee and informed consent from the subjects. **Result:** In our study, a statistically significant anaemia was found in female participants compared to male. In the present study, a statistically significant high HbA1C was found among the patients who had anaemia. (p value<0.033) In this study , the prevalence of anaemia increases with increasing duration of disease. (p value<0.0000001). **Conclusion:** Anaemia is one of the most common preventable conditions especially in diabetes mellitus. This study concludes that the need for periodic hematological screening in all diabetics presenting to hospital and adequate cost effective remedial measures in the form of supplementation of iron and vitamins will result in better outcome and prognosis and prevention of major complications.

INTRODUCTION

Diabetes mellitus (DM) is a metabolic disorder of great impact worldwide⁽¹⁾ Epidemiological data showed that in 2016 there were 285 million people affected with the disease in the world, and it is estimated that in the year of 2030 we will have about 440 million diabetic patients. The diabetes affects about 7% of the population worldwide. The prevalence of diabetes among adults in the southern states of India has been reported as being 18.6 % in urban populations and 10% in rural populations^(2,3) Now several studies suggest that anemia is twice as common in diabetics compared with non diabetics. Anemia in patients with diabetes is of great concern and it must be treated once diagnosed, since it may contribute to the pathogenesis and progression of cardiovascular disease, hypertension and various other complications. In study of Deepali Kaushik, Raman Parashar, Praveen K. Malik found over all 64.17 % of all male patients and 60.60% of all female patients were anaemic. Only about one third patients were found to be non anaemic.⁽⁴⁾ Salma M. AlDallal et al studied at 'Prevalence of Anemia in Type 2 Diabetic'. They found that prevalence of anemia is significantly greater in diabetic females (38.5%) than in diabetic males (21.6%) and in poorly controlled diabetics (33.46%) than those with glycemic status under control (27.9%) (P < 0.05)⁽⁵⁾ In study of Ankeet Kumar Panda, Rakhee Ajay Ambade et al found Poor glycemic control is related to the prevalence of anemia in patients with DM.⁽⁶⁾ Some studies have shown that the diabetic patients with renal insufficiency are at a higher risk of developing anemia than normal diabetics as the ability of their kidneys to produce erythropoietin reduces. Also, the hormone responsible for the production of RBCs is affected by diabetic neuropathy resulting in anemia.^(7,8,9)

MATERIALS AND METHODS

This is a Cross Sectional study of 200 cases of type 2 diabetes mellitus in the General medicine OPD and medicine ward of Jhalawar Medical College Jhalawar from July 2022 to december 2022 All the tests are done with permission from the Institutional Ethical Committee and informed consent from the subjects.

Inclusion Criteria: All patients above the age of 18 years, both genders, patients with type 2 diabetes mellitus who are

on antidiabetic drugs for at least 6 months. **Exclusion Criteria:** Patients less than 18 years, anemia due to chronic blood loss and other secondary causes, patients taking drugs for diseases like anticancer drugs, antiplatelet drugs causing anemia, diabetes mellitus patients with renal failure in the form of microalbuminuria, macroalbuminuria and kidney injury, consent not given, pregnant female, Type 1 diabetic patients.

RESULT

TABLE NO :1 DISTRIBUTION OF PATIENTS BASED ON PERIPHERAL SMEAR

PERIPHERAL SMEAR	NO. OF PATIENTS	PERCENTAGE
MICROCYTIC HYPOCHROMIC ANAEMIA	82	41%
DIMORPHIC ANAEMIA	34	17%
MEGALOBlastic ANAEMIA	18	09%
NORMOCYTIC NORMOBlastic ANAEMIA	10	5%
NORMAL	56	28%

CHART NO: 1

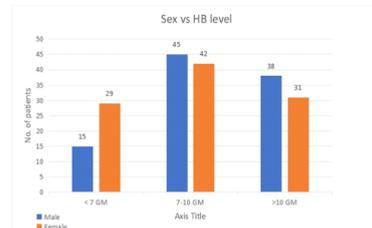


TABLE NO :2 DURATION OF DISEASE OF DM VS HEMOGLOBIN

DURATION OF DISEASE OF DM	HEMOGLOBIN (gm/dl)	
	MEAN	SD
< 5 YRS	11.15	2.97
5-10 YRS	9.98	2.87
> 10 YRS	7.43	1.40

ANOVA
P VALUE - 0.00000001
SIGNIFICANT

TABLE NO :3 HBA1C LEVELSVS HEMOGLOBIN

HBA1C	HEMOGLOBIN (gm/dl)	
	MEAN	SD
7-10 %	11.03	2.85
>10 %	8.18	2.30

UNPAIRED T TEST
P VALUE - 0.033
SIGNIFICANT

In our study, out of the 200 patients 102 were female and 98 were male patients. In our study, mean of Hb, HCT, MCV, MCH, MCHC, and RDW was 9.31±2.89 g/dl, 36.03±5.42%, 85.53±15.32 fl, 28.93±4.36 pg, 32.34±3.67 g/dl, and 16.2±2.94% respectively. In our study, mean of RBS, FBS, PPBS, HbA1C, and duration of disease was 309.1±81.21 mg/dl, 172.28±44.70 mg/dl, 239.58±54.84 mg/dl, 11.37±2.53% and 9.48±5.36 years respectively. In this study, out of the 200 patients, 144 patients were anaemic and the most common type of anaemia (82 patients) was Microcytic hypochromic anaemia followed by 34 patients, having dimorphic anaemia. In our study, a statistically significant high anaemia was found in female participants compared to male. In the present study, a statistically significant high HbA1C was found among the patients who had anaemia. In this study, the prevalence of anaemia increases with increasing duration of disease.

DISCUSSION

In our study out of 200 patients 98 were male (49%) and 102 were female (51%). In this study 144 (72%) patients were anaemic, so prevalence of anaemia among type 2 diabetes mellitus in our study is 72% This result is almost similar to study conducted by Dr Deepali Kaushik et al in Faridabad Haryana⁽⁴⁾ in which they found 63% diabetic patients were anaemic.

In another study, conducted by Cawood TJ et al⁽¹⁰⁾, out of 270 patients only 34 (12.29%) were anaemic. The higher prevalence of anaemia in our study was probably due to lack of knowledge about balanced diet, increased incidence and prevalence of infection and chronic diseases, malnutrition due to poverty, poorly controlled diabetics and poor access to medical care.

In our study we found that diabetic females were at higher risk of developing anaemia than diabetic males. Out of 102 diabetic females 76 (74.50 %) female patients have Hb <12 gm/dl and out of 98 diabetic males, 68 (69.38 %) male patients have Hb <13 gm/dl. Mean Hb of females was 8.80 gm/dl and male was 9.86 mg/dl. These finding are consistent with the findings of Alsayegh et al (2017) which reported prevalence of anaemia was more in diabetic females versus diabetic males⁽¹¹⁾. The possible reason for higher prevalence of anemia in females might be due to poor nutrition, less importance given to their own health due to lack of empowerment. This can be improved by educational interventions such as health awareness programs in the rural areas, provision of iron rich food, prescription of vitamin and iron supplements and knowledge of the diabetic complications.⁽¹²⁾

In this study we compared the HBA1C level with mean Hb of diabetic patients and found that patients with high HBA1C level have low haemoglobin thus prevalence of anemia is significantly higher in the poorly controlled diabetics. We also found that severity of anaemia is also increased with increasing age. These findings are in agreement with study by Mounika et al (2017) which reported poor glycemic control and old age to be associated with the higher incidence of anemia in diabetic patients⁽¹³⁾. The possible reasons for this increment in patients with poorly controlled diabetes, the

erythrocyte precursors of the bone marrow might be prone to prolonged direct toxicity to glucose toxicity or the mature erythrocytes can be affected by oxidative stress leading to disturbances in the erythrocyte function.⁽¹⁴⁾

Another finding of our study is association between the duration of diabetes and the prevalence of anemia. In our study we find that as duration of diabetes increases mean hemoglobin of patients decreases. In our study mean Hb of patients <5 years of diabetes was 11.15 gm/dl, while mean Hb of 5-10 years of disease was 9.98 gm/dl and mean Hb of >10 years of disease was 7.43 gm/dl. In study of Rathod GB, Parmar P, Rathod S et al, they found that Individuals with duration of diabetes of more than 5 years have 1.56 times higher risk of developing anaemia than those with diabetes for less than 5 years.⁽¹⁵⁾

CONCLUSION

Anaemia is one of the most common preventable conditions especially in diabetes mellitus. These set of changes characterizes the anemia as chronic condition, which has a significant adverse effect on quality of life of diabetic patients and is associated with the progression of the disease complications. This study concludes that the need for periodic hematological screening in all diabetics presenting to hospital and adequate cost effective remedial measures in the form of supplementation of iron and vitamins will result in better outcome and prognosis and prevention of major complications.

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