

Original Research Article

Prevalence of anemia in type II diabetes mellitus patients

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ABSTRACT

Background: Anemia is a common haematological finding in diabetic patients. The prevalence of anemia in the patients with diabetes is two or three times higher than in patients with comparable renal impairment and iron stores in the general population. As India is foreseen a diabetic capital of the world, it becomes imperative to recognize comorbidities such as anemia at the earliest. The aim of this study was to determine the prevalence of anemia among patients with type 2 diabetes. Author conducted a prospective analysis of 100 diabetic patients visiting the outpatient clinic in our institution. Duration of study is One Year (November 2016 - December 2017). Study performed at Om Sai Hospitals, Balapur, Hyderabad, Telangana, India. A 100 patients suffering from type 2 Diabetes Mellitus, attending Outpatient Department of General Medicine, were included in the study.

Methods: All the patients were subjected to detailed history, through clinical examination and investigation. Patients' blood samples were analyzed for Glycated hemoglobin (HbA1C) values and hemoglobin (Hb) levels. The prevalence of anemia was then determined defining anemia by an Hb level <13.0 g/dL for men and <12.0 g/dL for women.

Results: The prevalence of anemia in this study population was found to be 43%. The prevalence of anemia is significantly greater in diabetic females than in diabetic males and in poorly controlled diabetics than those with glycemic status under control.

Conclusions: We conclude that anemia is a prevalent finding in patients with type 2 diabetes mellitus and represents significant unrecognised burden.

Keywords: Anemia, Diabetes, Prevalence

INTRODUCTION

Diabetes mellitus (DM) is a non-infectious disease which has a high prevalence worldwide. It is a carbohydrate metabolism disorder which results in hyperglycemia due to either absolute insulin deficiency or reduced tissue response to insulin or both.¹ The changing lifestyle and dietary habits have increased the incidence of diabetes multifold times. The increasing incidence of diabetes mellitus is a major public health concern. Improvements in healthcare and specific treatments have increased the life expectancy and survival rate of the diabetic patients.^{2,3} On the other hand increased life span is associated with

higher prevalence of diabetes mellitus related complications and in turn poor life quality of patients. The disease can be classified into two predominant types, as type 1 DM (DM1), defined by the destruction of pancreatic β -cells and the absence of endogenous insulin, and as DM2, insulin resistance characterized by a frame, generally associated with obesity. Both types are featured by hyperglycemia above. Insulin resistance reduces glucose tolerance especially in muscle cells and adipocytes, where glucose uptake is insulin dependent. This causes glucose accumulation in the circulation and consequently a hyperglycemic state, generating homeostatic and systemic imbalance.⁴ Diabetes, especially

when poorly controlled, leads to complications such as nephropathy, retinopathy, and neuropathy as well as several disordered metabolic processes including oxidative stress which causes oxidative damage to tissues and cells.⁵ Anemia is one of the commonest blood disorders seen in patients with diabetes.

Anemia, as defined by World Health Organization (WHO) criteria less than 130 g/L for men and less than 120 g/L for women, is a common blood disorder and it is a condition in which the number of red blood cells (RBCs) is inadequate to meet the physiologic needs of the human body.⁶ Anemia has a high prevalence and is considered a public health problem affecting developing and developed countries. It occurs at all stages of life, especially in pregnant women and children.⁷ Many research studies have reported that anemia mostly occurs in patients with diabetes who also have renal insufficiency.⁸⁻¹⁰ A few other studies have also reported an incidence of anemia in diabetics prior to evidence of renal impairment. The aim of this study was to determine the prevalence of anemia among patients with type 2 diabetes.^{11,12}

METHODS

The study was carried out at Om Sai Hospitals, Balapur, Hyderabad, Telangana, India. This is a prospective analysis of 100 diabetic patients visiting the outpatient clinic in our institution. Study period was One Year from November 2016 to December 2017.

Sample collection

Patients' blood samples were collected and analyzed for Glycated hemoglobin (HbA1C) values and hemoglobin (Hb) levels.

Sampling methods

Diabetes was diagnosed, when the fasting glucose value was >125 mg/dL, or random blood glucose >200 mg/dL or patients on treatment for diabetes. Anemia was considered as per the World Health Organization's gender-specific criteria, (<13 g/dL in men and <12 g/dL in women).

Statistical methods

Interpretation and analysis of data obtained were carried out using standard test of significance. Statistical software of SPSS and EXCEL was used to analyse the data.

RESULTS

Characteristics of study participants

The average age of the study population was found to be 61.56±0.127 years. The average age of patients with anemia was found to be 59.11±0.216 years. The average age of patients without anemia was found to be

52.96±0.109 years. The difference in the average age was statistically significant in the patients with anemia and without anemia ($p < 0.05$). This indicates that the risk of anemia increases with age.

Table 1: Characteristics of study participants.

Variable	Frequency	Percentage
Gender		
Male	50	50%
Female	50	50%
Mean Age(years)	61.56±0.127	
Hypertension	62	62%
Obesity	71	71%
Heart Disease	24	24%
Respiratory Disease	13	13%
Smoking	21	21%
Alcoholism	7	7%
Physical Exercise	39	39%

Prevalence of anemia

There is a statistically significant relation between prevalence of anemia and gender, i.e. the prevalence of anemia is significantly greater in diabetic females than diabetic males ($p < 0.05$). The prevalence of anemia is significantly greater in poorly controlled diabetics than those with glycemic status under control ($p < 0.05$).

Table 2: Prevalence of Anemia.

Variable	Anemia	
	Present	Absent
Gender		
Male	17(34%)	33(66%)
Female	26(52%)	24(48%)
Total	43(43%)	57(57%)
Glycemic Status		
Well Controlled	14(38%)	22(62%)
Poorly Controlled	29(46%)	34(54%)
Total	43(43%)	57(57%)

DISCUSSION

Diabetes mellitus (DM) is a metabolic disorder of great impact worldwide. It is estimated that in the year of 2030 we will have about 440 million diabetics. Its worldwide prevalence is increasing fast among developing countries.

The type 2 diabetes affects about 7% of the population. The increasing prevalence of type 2 diabetes mellitus (DM2) has become a major public health concern. The diabetic patients' number has been increasing due to population and urbanization growth, increase in the prevalence of obesity and sedentary lifestyle, and the longer survival of patients with DM. Anemia represents an emerging global health problem that negatively impacts quality of life and requires an ever-greater

allocation of healthcare resources. The anaemic framework promotes reduced exercise capacity, fatigue, anorexia, depression, cognitive dysfunction, decreased libido, and other factors, which increase cardiac risk patients and depress the quality and life expectancy of the same.¹³ Anemia in diabetic person has a significant adverse effect on quality of life and is associated with disease progression and the development of comorbidities, as obesity and dyslipidemia that are strongly associated with diabetic framework and significantly contribute to increasing the risk of cardiovascular diseases.¹⁴

Thus, the present study is to evaluate the prevalence of anemia in a sample of patients with type 2 diabetes mellitus. The prevalence of anemia in this study population was found to be 43% which is in contrast with the prevalence reported by several other studies.¹⁵⁻¹⁷ We found that diabetic females were at higher risk of anemia than diabetic males. This finding is consistent with the findings of Alsayegh et al, which reported prevalence as 35.8% vs. 21.3% in diabetic females versus diabetic males. 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.¹⁸ 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. In our study, the prevalence of anemia is significantly higher in the poorly controlled diabetics.

Also, the average age of the patients with anemia is significantly higher than average age of patients without anemia. These findings are in agreement with recently published studies.^{19,20}

CONCLUSION

We conclude that anemia is a prevalent finding in patients with type 2 diabetes mellitus and represents significant unrecognized burden. Diabetic females and diabetic elderly are the most vulnerable group to anemia, thus care should be taken in terms of their nutrition and supplements.

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