



CODEN [USA]: IAJPBB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.3383276>Available online at: <http://www.iajps.com>

Research Article

**FREQUENCY OF ANEMIA IN CASES OF TYPE-II DIABETES
MELLITUS AT TERTIARY CARE HOSPITAL****Dr. Tahira Jabeen¹, Dr. Muhammad Faisal Hayat², Dr. Maryam Shahid³**¹Senior Demonstrator, Department of Pathology, Quaid-e-Azam Medical College, Bahawalpur²Medical officer, Basic health Unit Lagar, Sheikhopura,³Women Medical Officer, Basic health Unit Panwan, Nankana Sahib**Article Received:** June 2019**Accepted:** July 2019**Published:** September 2019**Abstract:**

Objective: To determine the frequency of anemia in cases of type-II diabetics presenting at tertiary care hospital Bahawalpur.

Material and methods: This cross sectional study was conducted at Department of Pathology, Bahawal Victoria Hospital, Bahawalpur from March 2018 to September 2018 over the period of 6 months. Total 100 type-II diabetics of any age either male or female were selected for this study and anemia was assessed in selected patients.

Results: Mean age of the patients was 62.33 ± 3.77 years. Out of 100 type-II diabetics, anemia was found in 43 (43%) patients. Anemia was found in 17 (34%) male patients and in 26 (52%) female patients. Difference of anemia between the males and females was not statistically significant with p value 0.1056. Total 38 (61.29%) hypertensives and 5 (13.16%) normotensives were anemic. Hypertensives found with higher rate of anemia as compared to normotensives with p value 0.000.

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.

Keyword: Anemia, diabetes mellitus, glycaemia, hypertension

Corresponding author:**Dr. Tahira Jabeen,**

Senior Demonstrator,

Department of Pathology,

Quaid-e-Azam Medical College, Bahawalpur

QR code



Please cite this article in press Tahira Jabeen et al., *Frequency Of Anemia In Cases Of Type-Ii Diabetes Mellitus At Tertiary Care Hospital., Indo Am. J. P. Sci, 2019; 06[09].*

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.⁸⁻¹²

Results of present study may help us for the early management of type-II diabetics for anemia. So that morbidity related to anemia may decrease.

METHODS:

This cross sectional study was conducted at Department of Pathology, Bahawal Victoria Hospital,

Bahawalpur from March 2018 to September 2018 over the period of 6 months. Study is approved by the ethical committee and written informed consent was taken from every patient. Total 100 type-II diabetics of any age either male or female were selected for this study. Weight and height were measured to calculate BMI and history of hypertension was taken. Patients' blood samples were collected and analyzed for Glycated hemoglobin (HbA1C) values and hemoglobin (Hb) levels. 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). Laboratory findings were entered on pre-designed proforma along with demographic profile of the patients.

Collected data was entered in SPSS version 18 and analyzed. Mean and SD was calculated for age and frequencies were calculated for gender, obesity, hypertension, glycemic status and anemia. Chi-square test was used to detect association of anemia with different variables. P value <0.05 was considered as significant.

RESULTS:

Mean age of the patients was 62.33 ± 3.77 years. Out of 100 type-II diabetics, anemia was found in 43 (43%) patients. (Fig. 1) Male diabetics were 50 (50%) and female diabetics were 50 (50%). Anemia was found in 17 (34%) male patients and in 26 (52%) female patients. Difference of anemia between the male and female patients was not statistically significant with p value 0.1056. (Table 1) Total 62 (62%) patients were hypertensive and 38 (38%) patients were normotensive. Total 38 (61.29%) hypertensives and 5 (13.16%) normotensives were anemic. Hypertensives found with higher rate of anemia as compared to normotensives with p value 0.000. (Table 2) Out of 60 (60%) obese diabetics, anemia was found in 32 (53.33%) patients. Total 40 (40%) diabetics were non-obese and anemia was noted in 11 (27.5%) patients. Statistically significant association between anemia and obesity was noted with p value 0.037. (Table 3) In 37 (37%) patients glycemic status was well controlled and anemia was found in 14 (37.83%) patients. In 63 (63%) patients glycemic status was poorly controlled and anemia was found in 29 (46.03%) patients. Statistically insignificant association between anemia and glycemic status was noted with p value 0.5310. (Table 4).

Fig. 1: Frequency of anemia

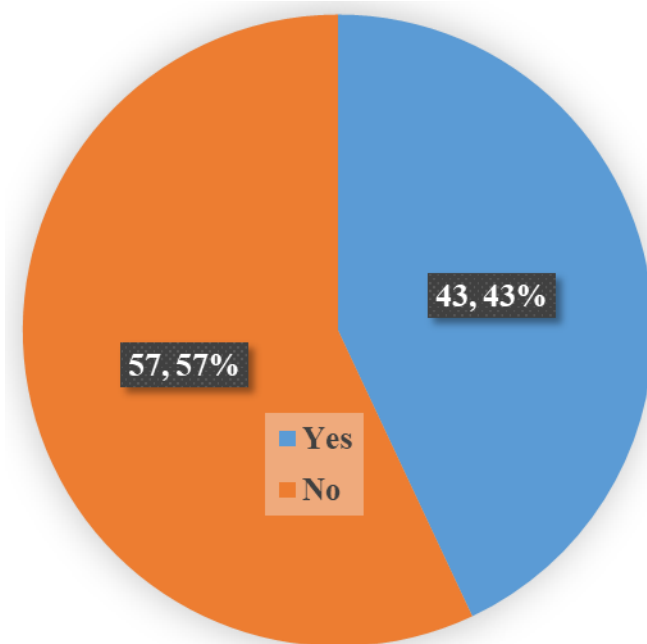


Table 1: Stratification for gender

Gender	Anemia		Total	P value
	Yes	No		
Male	17(34%)	33(66%)	50 (50%)	0.1056
Female	26(52%)	24(48%)	50 (50%)	
Total	43(43%)	57(57%)	100	

Table 2: Stratification for hypertension

Hypertension	Anemia		Total	P value
	Yes	No		
Hypertensive	38 (61.29%)	24 (38.71%)	62 (62%)	0.000
Normotensive	5 (13.16%)	33 (86.84%)	38 (38%)	
Total	43(43%)	57(57%)	100	

Table 3: Stratification for Obesity

Obesity	Anemia		Total	P value
	Yes	No		
Obese	32 (53.33%)	28 (46.67%)	60 (60%)	0.037
Non-obese	11 (27.5%)	29 (72.5%)	40 (40%)	
Total	43(43%)	57(57%)	100	

Table 4: Stratification for Glycemic Status

Glycemic status	Anemia		Total	P value
	Yes	No		
Well Controlled	14(37.83%)	23(62.16%)	37 (37%)	0.5310
Poorly Controlled	29(46.03%)	34(53.97%)	63 (63%)	
Total	43(43%)	57(57%)	100	

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.¹²

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.

REFERENCES:

1. Maitra A, Abbas AK. Endocrine system. In: Kumar V, Fausto N, Abbas AK, eds. Robbins and Cotran Pathologic basis of disease. 7th ed. Philadelphia, Saunders; 2005: 1156-1226.
2. Chen L, Magliano DJ, Zimmet PZ. The worldwide epidemiology of type 2 diabetes mellitus-present and future perspectives. *Nature Reviews Endocrinol.* 2012 Apr;8(4):228.
3. Genetic basis of type 1 and type 2 diabetes, obesity, and their complications. *Advances and emerging opportunities in diabetes research: a Strategic Planning report of the DMICC.*
4. Azevedo M, Alla S. Diabetes in sub-saharan Africa: kenya, mali, mozambique, Nigeria, South Africa and zambia. *Int J Diabetes Devel Countr.* 2008 Oct;28(4):101.
5. Global burden of diabetes. *International Diabetes federation. Diabetic atlas; Brussels. 5th Edition; 2011.*
6. Silva TR, Zanuzzi J, Silva CDM, Passos XS, Costa BMF. Prevalence of cardiovascular diseases in diabetic and nutritional status of patientes. *J Health Sci Inst.* 2012;30(3):266-70.
7. Angelousi A, Larger E. Anaemia, a common but often unrecognized risk in diabetic patients: a review. *Diabetes Metabolism.* 2015;41(1):18-27.
8. Martínez-Pérez B, De La Torre-Díez I, López-Coronado M. Mobile health applications for the most prevalent conditions by the World Health

- Organization: review and analysis. *J Med Inter Res.* 2013;15(6):e120.
9. Fava S, Azzopardi J, Ellard S, Hattersley AT. ACE gene polymorphism as a prognostic indicator in patients with type 2 diabetes and established renal disease. *Diabetes Care.* 2001;24(12):2115-2120.
 10. Jha V, Garcia-Garcia G, Iseki K, Li Z, Naicker S, Plattner B, Saran R, Wang AY, Yang CW. Chronic kidney disease: global dimension and perspectives. *Lancet.* 2013 Jul 20;382(9888):260-72.
 11. Escorcio CS, Silva HF, Junior GB, Monteiro MP, Gonçalves RP. Evaluation of anemia treatment with EPO and oral and iv iron in patients with chronic kidney disease under hemodialysis. *RBSA.* 2010;42(2):87-90.
 12. Weiss G, Goodnough LT. Anemia of chronic disease. *New Eng J Med.* 2005 Mar 10;352(10):1011-23.
 13. Macdougall IC, Eckardt KU, Locatelli F. Latest US KDOQI Anaemia Guidelines update-what are the implications for Europe?. *Nephrology Dialysis Transplantation.* 2007;22(10):2738-2742.
 14. MacCiò A, Madeddu C. Management of anemia of inflammation in the elderly. *Anemia.* 2012;2012:20.
 15. Moreira TD, Mascarenhas MA. Avaliação da prevalência de anemia em grupos Diabéticos e não Diabéticos e sua relação com insuficiência renal crônica. *NewsLab.* 2004;62:84-90.
 16. Singh DK, Winocour P, Farrington K. Erythropoietic stress and anemia in diabetes mellitus. *Nature Reviews Endocrinol.* 2009 Apr;5(4):204-10.
 17. WHO. Anaemia. World Health Organization; 2012.
 18. Alsayegh F, Waheedi M, Bayoud T, Al Hubail A, Al-Refaei F, Sharma P. Anemia in diabetes: Experience of a single treatment center in Kuwait. *Primary Care Diabetes.* 2017 Aug 1;11(4):383-8.
 19. Lipschitz DA. Screening for nutritional status in the elderly. *Primary Care.* 1994 Mar;21(1):55-67.
 20. Hevward VH, Stolarczyc LM. Avaliação da composição corporal aplicada. São Paulo, Brazil: Manole; 2000.