DOI: 10.21276/aimdr.2018.4.6.ME2

Original Article ISSN (O):2395-2822; ISSN (P):2395-2814

Occurrence of Anemia in Patients of Type 2 Diabetes Mellitus.

Saket Kumar Mishra[1], Amit Kumar[1]
[1]Senior Resident, Rama medical college and hospital, Hapur, UP.

Received: July 2018
Accepted: August 2018

ABSTRACT

Background: To study the occurrence of Anemia in Patients of Type 2 Diabetes Mellitus and to promote awareness about early detection of Anemia in such subjects. **Method:** Out of numerous patients who came to a tertiary care hospital in Ghaziabad With high blood sugar level, Type2 Diabetes was diagnosed after basic investigations and occurrence of Anemia was studied in such patients by cross-sectional study. Type of Anemia was also studied in such subjects. **Results:** Among those 100 patients enrolled for study 68 were found to have Anemia. Normocytic normochromic Anemia was the most common type of Anemia in our subjects enrolled for study and Macrocytic Anemia was least common type in them. **Conclusion:** Anemia remains hidden in majority of Diabetic Patients and even in Diabetic with normal renal function. It is very simple to detect it at earlier stage and create awareness among patients to minimize complications.

Keywords: Anemia, Haemoglobin, Diabetes Mellitus.

INTRODUCTION

Anemia may occur in diabetes because the hormone that regulates red Blood cell production, erythropoietin (EPO), is produced by the kidneys and kidney damage at various levels is known complication of diabetes. However, patients with Type 2 Diabetes may be more vulnerable to the effects of anemia because many also have significant cardiovascular disease and hypoxia-induced organ damage. Even in diabetic patients with preserved renal function,

Prevalence of Anemia is increased. Though patients with diabetes are regularly monitored for variety of complications such as neuropathy, nephropathy and retinopathy, Hb concentration are frequently not routinely assessed. It is interesting that reduction in Hb often occur before the onset of overt diabetic nephropathy.

The reduction in Hb occurs due to variety of reasons. Approximately 90% of the Hormones erythropoietin is produced by the kidneys. Due to the fact that functional renal tissue declines at some stage in patients with diabetes, the body is unable to produce adequate amount of erythropoietin by kidney in response to hypoxia. Another factor adversely affecting Hb production in diabetic patients is the use of medication which includes metformin, fibrates, thiazolidinediones and A.C.E inhibitors. Tubulointerstitial damage in patients of diabetes occurs early in the course of disease, even before reduction in G.F.R or albuminuria is noticed. In such patients systemic inflammation associated with microangiopathy leads to production of interleukins and tumor necrosis factor. These inflammatory mediators blunt the effect of erythropoietin on bone marrow, where erythroid precursors are stimulated. Correction of Anemia can improve cardiac function possibly by reducing exercise induced myocardial ischemia.

Satisfaction of diabetic patient's increases when Anemia is corrected, as evidenced by higher quality of life scores, improved sexual function, better cognition, less depression and increased socialization. Finally it has been noticed that correction of Anemia reduces hospitalization and mortality rates. Consequently, early detection of Anemia in patients with diabetes and monitoring Hb level in them is essential to prevent further complications.

Name & Address of Corresponding Author
Dr. Amit Kumar
Senior Resident,
Rama medical college and hospital,
Hapur,
UP.

MATERIALS AND METHODS

For all the patients included in the cross-sectional study, a detail history and physical examination were done at admission which was followed by Lab investigations. Random blood sugar, Fasting blood sugar, and post prandial blood sugar was noted. Oral glucose tolerance test and HbA1c was also tested to

confirm the diabetic subjects. Complete hemogram of all subjects were studied. It included Hemoglobin (Hb), TLC, DLC, MCV, MCHC, Reticulocyte count, Iron studies, serum B12, serum Folic acid and Peripheral smear for type of Anemia. For the diagnosis of type 2 diabetes plasma glucose of ≥ 126 mg/dl after an overnight fasting on more than one occasion was considered. Two hours after 75 g oral glucose, diagnostic values of ≥ 200mg/dl was taken. Postprandial and Random blood sugar were also recorded. HbA1c cut off was 6.5%.Normal renal function (i.e. absence of renal impairment) was defined as serum creatinine level less than 1.5 mg/dL.

RESULTS

Among those 100 patients enrolled for study 68 were found to have Anemia. The age ranged from 30 to 84 years. Among those 68 Anemic patients, 37 were males and 31 females. Mean Duration of Diabetes among those Anemic patients was 8.24 years with standard deviation of 3.54 years and ranged from 2 to 18 years with median value 7 years. P value was statistically significant and< 0.001.Among those 68 Anemic subjects, 9 had Macrocytes, 29 had Microcytes, and 30 had Normocytic blood picture. Mean HBA1C of our diabetic subjects with Anemia were 7.67 with standard deviation of 1.31.The linear regression analysis was done which revealed that Hemoglobin levels decreases with increase in duration of diabetes. There was statistically significant correlation between hemoglobin level and duration of Diabetes (P value<0.001),(r-0.785).In our study microcytic Anemia was more common in females (48.4%) while normocytic anemia was more common in males(48.6%).

DISCUSSION

India is experiencing rapid socioeconomic progress and urbanization which carries a considerable share of the global burden of Diabetes. Studies in different parts of India have demonstrated an increasing prevalence of diabetes not only in urban populations, but also in rural populations as a result of the urbanization of lifestyle parameters. India leads the world with largest number of diabetic patients earning the distinction of being termed the "diabetes capital of the world". Anemia is a common complication of Diabetes Mellitus (DM), though usually related to renal failure but it has been studied that in Diabetic patients with normal kidney function also Anemia is more common. The present study was designed to investigate whether Anemia is also common in Diabetic subjects with normal kidney function test so that it may be detected earlier .Our study was on Type 2 Diabetic subjects because of very simple reason that Type 2 Diabetes is far more common type of diabetes than any other types and is also linked to complicated entity so called metabolic syndrome. Data were analyzed with typical descriptive statistics, using unpaired t test for comparing normally distributed continuous variable whereas the Mann-Whitney U test was used for those variables that were not normally distributed. Categorical variables were analyzed using either the chi square test or Fisher's exact test. For all statistical tests, p value <0.05 was taken to indicate a significant difference. Out of total 100 subjects of Type 2 Diabetes Mellitus, we found 68% subjects were having Anemia. Their age ranged from 30- 84 years and among those anemic subjects 37 were Males and 31 were females. There has been a similar study by Osama and colleagues in Egypt but they studied both type of subjects who were having normal as well as abnormal renal function and found that there was a significant decrease in hemoglobin level in stage 3 CKD in comparison to stage1 and stage2.Grossman and colleagues also studied Diabetes mellitus with normal renal function and observed Anemia is more common in Diabetic patients even when kidney function test is normal. When we analyzed the gender distribution of Anemia in the current study of our subjects, our results were similar to the one reported by Babatunde and colleagues who found that there was no predominance of Anemia restricted to the particular gender and it was very common in both males and females. Our study was also designed in view to study that whether the duration of Type 2 Diabetes Mellitus had anything to do with Anemia as emphasized by the previous authors who had conducted similar studies. Our observation was in accordance with the previous studies and we also noticed that Diabetic subjects are more likely to be anemic if the duration of diabetes increased.

CONCLUSION

Anemia remains hidden in majority of Diabetic Patients. Our study indicates that Anemia may be common even in those Diabetic patients who are having normal renal function .Our data supports that duration of Diabetes and Ageing increases the risk of Anemia in Diabetic Patients. Diabetic patients should be periodically screened for Anemia and Routine hematological test is recommended. More studies are required to support the fact that early correction of Anemia significantly reduces the complication of patients of Type 2 Diabetes mellitus with normal renal function and such research may also help to understand the exact mechanism of development of Anemia in Diabetic Patients with intact kidney function which is still not very clear.

REFERENCES

1. Thomas MC, Power D, Macisaac RJ et al. A cross-sectional survey on unrecognized Anemia in patients with diabetes. Diabetes care 2003\26\1164-1169

2. Dikow R, Schwenger V, Schömig M et al.How should we manage anaemia in patients with diabetes? Nephrol Dial Transplant.2001; 17\67–72
3. Horwich TB, Fonarow GC, Hamilton MA, et al.Anemia is associated with worse symptoms, greater impairment in functional capacity and a significant increase in mortality in patients with advanced heart failure. J Am Coll Cardiol .2002;39@1780–1786
4. Osterby R, Tapia J, Nyberg G, et al.Renal structures in type 2 diabetic patients with elevated albumin excretion rate.J Am Soc Nephrol 2001;109@751–761
5. Astor BC, Muntner P, Levin A, et al. Association of kidney function with anaemia: the Third National Health and Nutrition Examination Survey (1988-1994)Arch Intern Med.2002;24(162):1401–8.
6. Schmid-Schönbein H, Volger E. Red-cell aggregation and red-cell deformability in diabetes. Diabetes.1976;25@897–902.
7. Silverberg DS, Wexler D, Blum M,et al. The effect of correction of anaemia in diabetics and non-diabetics with severe resistant congestive heart failure and chronic renal failure by subcutaneous erythropoietin and intravenous iron. Nephrol Dialysis Transplant2003;18@141 –146
8. American Diabetes Association. Diagnosis and Classification of Diabetes mellitus. Diabetes Care.2004;27(Suppl. 1):S5–10.
9. Hussain A, Rahim MA, Azad Khan AK et al. Type 2 diabetes in rural and urban population: diverse prevalence and associated risk factors in Bangladesh. Diabet Med. 2005;22:931–936.
10. Goldhaber A, Ness-Abramof R, Ellis MH. Prevalence of anemia among unselected adults with diabetes mellitus and normal serum creatinine levels. Endocr Pract 2009; 15: 714–719

How to cite this article: Mishra SK, Kumar A. Occurrence of Anemia in Patients of Type 2 Diabetes Mellitus. Ann. Int. Med. Den. Res. 2018; 4(6):ME07-ME09.

Source of Support: Nil, **Conflict of Interest:** None declared