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Impact Factor: Study of Anemia in Patients with Type 2 Diabetes

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Abstract
Background- Diabetes mellitus (DM) is a metabolic disorder of great impact worldwide Type 2 diabetes mellitus (T2DM) is a metabolic disorder and one of the major health related problem in present society due to speedy industrialization and urbanization. T2DM accounts for high morbidity and mortality due to various micro and macro vascular complications. Its worldwide prevalence is increasing fast among developing countries. The type 2 diabetes affects about 7% of the population.
Methods- This is a descriptive and analytical study of the type of case studies in patients with DM2 and ages less than 65 years.
Results- We observed statistically significant difference in hematological variables between groups with and without anemia ($p < 0.0001$).
Conclusion- The anemia of chronic disease, which affects quality of life of diabetic patients.

Keywords: Diabetes Mellitus (DM), Anemia

Introduction

Type 2 diabetes mellitus (T2DM) is a metabolic disorder and one of the major health related problem in present society due to speedy industrialization and urbanization. T2DM accounts for high morbidity and mortality due to various micro and macro vascular complications [1]. Anemia is frequently found in patients with T2DM [2]. Different cross-sectional studies have reported that prevalence of anemia in patients with diabetes mellitus range between 14-23% [3]. Anemias if not corrected, can lead to serious morbidity like evectional breathlessness and fatigue. But in patients with diabetes, anemia is an independent risk factor for the development of diabetic retinopathy [3].

Several studies suggest that anemia is twice as common in diabetics compared with non-diabetics [4]. Despite these facts, anemia is unrecognized in 25% of the diabetic patients [5]. Anemia also develops earlier and is more severe in patients with diabetes than in patients with renal impairment from other causes [6]. Additionally, the risk of anemia is higher in people with diabetic nephropathy compared with people with nephropathy from other causes and is associated with a more rapid decline in the GFR [7, 8]. However, it develops whilst serum creatinine is within the normal range in 5% of the cases [7]. Recent studies have linked anemia with relatively low serum erythropoietin in persons with either type 1 or type 2 diabetes, even without advanced kidney disease or overt uremia [9] The etiology of anemia in diabetes is multi factorial and includes inflammation, nutritional deficiencies, concomitant autoimmune diseases, drugs, and hormonal changes in addition to kidney disease [5]. Anemia is found to contribute to the development and progression of micro- and macro-vascular complications of diabetes, which has a negative impact on the quality of life and an additional burden on the health of the patients [6, 10]. It is therefore important to diagnose and correct anemia among diabetic patients early.

Diabetes mellitus (DM) is a metabolic disorder of great impact worldwide. Epidemiological data showed that in 2010 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 diabetics. [11]

Its worldwide prevalence is increasing fast among developing countries. The type 2 diabetes

affects about 7% of the population. [12]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. Diabetes is a highly disabling disease, which can cause blindness, amputations, kidney disease, anemia, and cardiovascular and brain complications, among others, impairing the functional capacity and autonomy and individual quality of life. [13, 14]

Anemia in diabetic person has a significant adverse effect on quality of life and is associated with disease progression and the development of co morbidities, as obesity and dyslipidemia that are strongly associated with diabetic framework and significantly contribute to increasing the risk of cardiovascular diseases. [15]

This study aimed to determine the prevalence of anemia in diabetics and the occurrence of micro and macro vascular complications in them.

Material and Methods

This is a descriptive and analytical study of the type of case studies in patients with DM2 and ages less than 65 years. The study was conducted from May. 2017 to Dec. 2017. All participants signed the informed consent in this research. The study excluded those patients who had difficulties to understand the proposed procedures, those who were bedridden, and those who had difficulty walking.

The interviews and tests were conducted by trained health professionals. Data collection was performed by applying a semi structured instrument. The presence of anemia was considered as the dependent variable; the patient was considered anemic, according to the World Health Organization reference values. Thus, the patient was considered anemic patient when the blood count hemoglobin < 12 g/dL and <14 g/dl for female and male respectively.

Definition of Diabetes

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. The diagnosis of diabetes was based on the "Definition and description of diabetes mellitus" from American Diabetes Association 2010 [16].

Anemia

Was considered as per the World Health Organization's gender-specific criteria, (<13 g/dL in men and <12 g/dL in women) [17]. Anemia was defined as normocytic with a mean corpuscular volume (MCV) of 80 to 100 FL, microcytic with the MCV <80 FL, and macrocytic with the MCV >100 FL [18]

Results

The study population had an average age of 56.2 ± 8.3 years, body mass index of 28.9±4.3 kg/m2,

Table: Hematological variables in patients with DM2 according to the presence of anemia.

Variable	Anaemia	No Anaemia	p-value	Significant
HB level	9.6± 0.62	13.9± 0.63	< .00001	S
RBC (millions/mm3)	4.01± 0.27	4.89± 0.22	< .00001	S
Hematocrit (%)	31.22± 2.09	42.36± 1.83	< .00001	S

We observed statistically highly significant ($p<0.0001$) difference in hematological variables between groups with and without anemia ($p < 0.0001$).

The prevalence of anemia in our study population is 55.5%, bet anemia diabetes patient very dangerous disease which is compared to the result from previous studies.

Discussion

Anemia in patients with type 2 diabetes is an increasingly acknowledged entity [5]. Association of both the risk factors is associated with enhanced risk of developing micro and macro vascular complications. It is also reported that life span of diabetic patients with anemia is less as compared to patients without anemia [6]

Often, chronic diseases, such as DM, are accompanied by mild-to-moderate anemia, often called anemia of inflammation or infection or anemia of chronic disease [15]. Andrews and Arredondo [19] determined the presence of anemia in type 2 diabetic patients as well as evaluating the expression of genes related to inflammation and immune response. The results found by the authors demonstrate that diabetic patients with anemia exhibit increased expression of proinflammatory cytokines as compared to diabetic patients only.

Conclusion

High prevalence of anemia in patients with diabetes mellitus suggests that the patients of diabetes should also be screened for anemia. The anemia of chronic disease, which affects quality of life of diabetic patients

Anemia is a common accompaniment with diabetes and it is seen early even in the blood impairment. So, it may have further role in the development and progression of both micro and macro-vascular complications.

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