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# Anaemia in Patients with Type 2 Diabetes in Bhilwara.

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**Abstract**

**Background-** Diabetes mellitus (DM) is a metabolic disorder of great impact worldwide.

**Methods-** This is a descriptive and analytical study of the type of case studies in patients with DM2 and ages less than 75 years.

**Results-** We observed statistically significant difference in hematological variables between groups with and without anemia ($p < 0.05$).

**Conclusion-** The anemia of chronic disease, which affects quality of life of diabetic patients.

**Keywords-** Diabetes Mellitus (DM), Hematological, Anemia.

## Introduction

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[1].

Its worldwide prevalence is increasing fast among developing countries. The type 2 diabetes affects about 7% of the population[2]. 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.[3-4]

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 therisk of cardiovascular diseases.[5]

## Material and Methods

This is a descriptive and analytical study of the type of case studies in patients with DM2 and ages less than 75 years. The study was conducted from Dec. 2017 to May 2018. 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 semistructured 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.

**Results**

The study population had an average age of 58.2 ± 8.8 years, body mass index of 30.2±4.2 kg/$m^2$ , and a median of disease diagnosis time of 4.7 years.

Table 1: Hematological variables in patients with DM2 according to the presence of anemia.

| Variable | Anaemia | No anaemia | p-value |
|---|---|---|---|
| HB level | 10.7 ± 0.92 | 13.20 ± 0.56 | <0.05 |
| RBC (millions/mm3 ) | 4.18 ± 0.37 | 4.60 ± 0.32 | <0.05 |
| Hematocrit (%) | 34.8 ± 5.12 | 40.40 ± 2.80 | <0.05 |

We observed statistically significant difference in hematological variables between groups with and without anemia ($p$ < 0,05).

**Discussion**

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 [5]. Andrews and Arredondo [6]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. In anemic patient increase in IL-6 production, as well as B cell activity, was confirmed which reinforces the association between IL-6 and antierythropoietic action. Moreover, the diabetic and anemic patients had high levels of C-reactive protein and ferritin ultrasensible; however, these diabetic and anemic patients had low iron contents, showing that ferritin increases were associated with chronic inflammatory process present in diabetes [7].

**Conclusion**

The anemia of chronic disease, which affects quality of life of diabetic patients.

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