University of Diyala

College of medicine

Department of Internal Medicine

Review article in

" Prevalence of anemia in diabetic " Patient

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بسم الله الرحمن الرحيم

(نَرْفَعُ دَرَجَاتٍ مَّن نشَّاءُ وَفَوْقَ كل ذِّي عِلْمْ عليم....)

صدق الله العظيم

سورة يوسف آية(٧٦)

الاهداء

الاهداء اولآ الى وجه الله تعالى

في جميع مراحل الحياة يوجد أناس يستحقون منا الشكر والتقدير

واولى الناس بالشكر

والدي العزيز الذي جرع الكأس فارغآ ليسقيني قطرة حب

والدتي العزيزة التي وضعتني على طريق الحياة وكان لها الفضل الكبير

لنجاحي

والى جميع من وقفوا بجانبي وساعدوني وبالخصوص

الى أصدقائي والى جميع اساتذتي الكرام بوجه عام والى إلدكتورة

"رنا عبد السلام " المشرفة على البحث بوجه خاص التي كان لها

دور كبير في اعطائي المعلومات القيمة اهدي لكم بحث تخرجي

المتواضع وأتمنى ان تحوز على رضاكم

Abstract

Background

Anemia is a common finding in patients with diabetes, even in the absence of kidney disease and is a risk factor for adverse outcomes, including all-cause and cardiovascular mortality. Despite this, relatively little is known about the burden of anemia among adults with diabetes in sub-Saharan Africa. The aim of this study was to determine the prevalence of anemia among diabetic adults(1).

Introduction

The interpretation of such results is not easy. Anemia in T1D may have a complex, multifactorial background [2]. Among the most common causes of anemia in the course of T1D in children is iron deficiency, which will present as anemia with microcytosis in the blood count. Its prevalence is higher among T1D patients in comparison to people without diabetes [3]. However, anemia that accompanies inflammation may also present with microcytosis [4]. On the other hand, in cases of diabetic nephropathy, because of insufficient erythropoietin production, normocytic anemia develops [5]. If diagnostic procedures rule out the most common causes, cooccurrence of other autoimmune diseases (thyroiditis, celiac disease, Addison's disease, and autoimmune atrophic gastritis) that may be accompanied by anemia of various morphologies should be taken into account [6]. The variability of causes and their mutual overlapping significantly impedes the interpretation of the obtained results, but the proper diagnosis conditions optimal treatment and allows avoiding systemic complications. Additionally, adequate interpretation of the hba1c measurement, that is routinely performed during diabetes control visits, requires also to know the patient's serum

iron concentration, because the presence of iron deficiency anemia correlates with higher HbA1c values [7]. It is interesting that even though the value of a performed blood count is well known as well as the multiplicity of information it gives, there are no recommendations whether and when it should be carried out in T1D patients(8)

Approach to anemia in people with Diabetes:

1- chronic kidney disease

the anemia associated with CKD is usually normocytic and normochromic and without iron deficiency (ferritin >100ng/ml and transferrin saturation index [TSAT], >20%). If other parameters are found to be abnormal other causes of anemia should be suspected.

It should be kept in mind that the diagnosis of renal anemia is a diagnosis by exclusion, that is, when a patient has CKD and anemia and other causes have been excluded.

Several factors have been implicated:

- Erythropoietin deficiency (the most significant)
- Toxic effects of uraemia on marrow precursor cells and

retaining of Bone marrow toxins in CKD

- Reduced red cell survival
- Bone marrow fibrosis secondary to hyperparathyroidism
- Hematinic deficiency – iron, vitamin B12, folate

Reduced intake, absorption and utilisation of dietary iron

- Increased red-cell destruction, Abnormal red-cell

membranes causing increased osmotic fragility .

- Increased red-cell destruction may occur during

haemodialysis owing to mechanical, oxidant and thermal damage.

- Increased blood loss – occult gastrointestinal bleeding ,

blood sampling, blood loss during haemodialysis,

capillary fragility, or because of platelet dysfunction

2- These drugs include ACE inhibitors, fibrates, metformin, and pioglitazones: long term use of metformin lead to vitB12 deffiancy and cause megaloblastic anemia (macrocytic hyperchromic

3-Nutritional anemia (IDA and megaloblastic anemia) , celiac disease ,IBD malnutrition (eating disorders)

- Microcytic hypochromic anemia
- Reduce in Hb (6-8gm/dl).
- Reduce PCV, MCV, MCH, and MCHC.
- Retic count is low to degree of anemia.
- WBC usually normal, and Platelets counts often increase.

4-autoimmune like SLE adrenal insufficiency Rheumatoid arthritis especially type 1: Characteristic findings on a complete blood count (CBC) can include a normochromic, normocytic anemia indicating the chronicity or severity of a disease and can also include an elevated or decreased platelet count and/or white blood cell count. Leukopenia and thrombocytopenia are common in patients with systemic lupus erythematosus (SLE).

5-Anemia of chronic disease: The anemia of chronic disease should be suspected in patients with microcytic or normocytic anemia who also have chronic illness, infection, inflammation, or cancer. If anemia of chronic disease is suspected, serum iron, transferrin, reticulocyte count and serum ferritin are measured. Hb usually is > 8 g/dL (> 80 g/L) unless an additional mechanism contributes to anemia, such as concomitant iron deficiency or iatrogenic phlebotomy.

Symptoms of Anemia

The symptoms of anemia vary according to the type of anemia, the underlying cause, the severity and any underlying health problems, such as hemorrhaging, ulcers, menstrual problems, or cancer. Specific symptoms of those problems may be noticed first.

Symptoms common to many types of anemia include the following:

Fatigue ,tachycardia ,pallor, weakness , irritability ,insomnia ,sob ,leg cramp

Sign and symptom in IDA

- Fatigue and diminished capability to perform hard thing
- Leg cramps on climbing stairs
- Craving ice (in some cases, cold celery or other cold vegetables) to suck or chew
- Poor scholastic performance
- Cold intolerance
- Reduced resistance to infection
- Altered behavior (eg, attention deficit disorder)
- Dysphagia with solid foods (from esophageal webbing)
- Worsened symptoms of comorbid cardiac or pulmonary disease

While in hemolytic disease

- in intravascular hemolysis, iron deficiency due to chronic hemoglobinuria can exacerbate anemia and weakness.
- Tachycardia, dyspnea, angina, and weakness occur in patients with severe anemia, as cardiac function is sensitive to anoxia.
- Persistent hemolysis may result in the development of bilirubin gallstones; these patients may present with abdominal pain.
- Bronze skin color and diabetes occur in hematosiderosis; iron overload may occur in patients who have received multiple transfusions or those who have been administered iron therapy erroneously.
- Dark urine may be due to hemoglobinuria.
- In addition to hemolysis, patients with thrombotic thrombocytopenic purpura (TTP) may experience fever, neurologic signs, renal failure, and thrombocytopenia.
- Leg ulcers may develop in patients with sickle cell anemia and other hemolytic disorders, as a result of decreased red blood cell (RBC) deformability and endothelial changes.

- Venous thromboembolism occurs in 15% to 33% of adults with warm autoimmune hemolytic anemia, especially in the first few weeks after onset. Children with hereditary spherocytosis (HS) are also at increased risk for thrombosis. Hypercoagulability is especially marked in children with HS who are experiencing a hemolytic crisis

Investigation of anemia in people with Diabetes:

- CBC & ESR
- S.B12
- Blood film
- TIBC and iron study
- C reactive protein and celiac screen
- Renal function test

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