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To Evaluate the Importance of Hypoferritinemia in the Absence of Anemia and the Necessity of its Being Readily Identifiable

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ABSTRACT
Anemia is a condition that arises when the body lacks enough hemoglobin (Hb) or red blood cells (RBC) to meet the needs of its physiological functions. Even in the presence of normal complete blood count (CBC) values, hypoferritinemia without anemia might present with subtle clinical signs such as overall weakness, easy fatigability, melancholy state and hair loss. The goal of this study was to demonstrate the importance of hypoferritinemia in the absence of anemia and the need to identify it quickly in order to prevent patients who have a prolonged history of a non-specific generalized sense of weakness from going undiagnosed. The present probe was not launched until its creators received clearance from the ethics committee of the institution. In order to identify hypoferritinemia in the absence of anemia problems the mean corpuscular hemoglobin, red blood cell count, hemoglobin, hematocrit and serum ferritin levels were assessed. A sample of 1170 females with hypoferritinemia were evaluated and the findings indicated that 312 women had hypoferritinemia while having normal levels of red blood cells, hemoglobin, mean corpuscular volume and mean corpuscular hemoglobin. There were a total of 463 male patients who were investigated and of those a diagnosis of hypoferritinemia without anemia was made for 438 of them. Twenty-one of the 438 patients with hypoferritinemia who did not have anemia were underweight, 369 belonged to the normal weight category, 26 patients belonged to the overweight category and 22 patients belonged to the obese category. 1.6-1, with women in the majority. 1.6-1, with women in the majority. Hypoferritinemia without anemia is a concealed hematological ailment that needs a new term to differentiate it from IDA because even though both patients have low serum ferritin, they are two separate illnesses. This is despite the fact that both cases have hypoferritinemia without anemia. Hypoferritinemia without anemia is not an implied diagnosis of iron deficiency anemia since it can happen in people who do not develop anemia, including patients with polycythemia who are undergoing treatment that involves repeated vein resection. Anemia, red blood cells, hemoglobin, complete blood count, hypoferritinemia.

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Key Words
Anemia, red blood cells, hemoglobin, complete blood count, hypoferritinemia

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INTRODUCTION

Anemia is defined by the World Health Organization as a condition that occurs when there are not sufficient red blood cells (RBC) in the body to satisfy the body's physiological requirements. The presence or absence of hemoglobin (Hb) alone is not sufficient to establish a diagnosis of anemia[1,2]. A person is said to have anemia if their mean red blood cell mass, hemoglobin content and/or packed red blood cell volume are all lower than what is considered normal for their age and gender. In addition to general fatigue, palpitations, easy fatigability, sadness and hair loss can be caused by low ferritin storage, which is medically referred to as hypoferritinemia[3]. Iron is present in every cell of the human body and is necessary for a wide variety of bodily functions. It is an integral part of the molecule that carries oxygen from the lungs to the tissues (the Hb molecule) contributes to the utilization and storage of oxygen in the muscles (the myoglobin molecule) acts as a cytochrome-containing transport medium for electrons within the cells and is an essential component of enzyme activities in a wide variety of tissues. These crucial processes may be impeded by a lack of iron, which might lead to morbidity[4].

When the serum ferritin level is below the reference range set by our institute-that is when it is less than 11 ng mL^{-1} for females and less than 23 ng mL^{-1} for males-hyperferritinemia is diagnosed. Reduced iron intake, poor nutrition and gastrointestinal malabsorption constraints resulting from bariatric surgery can all cause hypoferritinemia. Hemorrhoids, colon cancer, peptic ulcers, menorrhagia, hematuria, Crohn's disease, ulcerative colitis and celiac disease are just a few of the conditions in which it might appear. It's possible that pregnancy and puberty, which are linked to increased iron requirements, are the cause[5]. In extremely rare cases, issues with iron metabolism might lead to hypoferritinemia[6]. The purpose of this study was to highlight the relevance of hypoferritinemia without anemia and the necessity of quickly identifying it, so that it is not missed when a patient has a protracted history of indistinct overall weakness.

MATERIALS AND METHODS

The current investigation did not get underway until after its creators had secured approval from the institution's ethics committee. The data came from Prasad Hospital in Athani, which is affiliated with our institute and its computerized database of information pertaining to area polyclinics. There was a wide age gap among the patients, ranging from 15-88 years. Adult participants needed to have hypoferritinemia as well as normal complete blood count (CBC) features in order to satisfy the inclusion criteria. In addition, patients whose serum ferritin levels were high or normal were not considered. The CBC function of a Coulter analyzer was carried out. An access immunoassay system (manufactured by Beckman Coulter) was used to determine the levels of serum ferritin.

Statistical analysis: For each and every statistical analysis the most recent release of IBM SPSS was utilized. When comparing the mean values of the variables derived from two distinct samples the unpaired t-test is a useful statistical analysis method to put into practice. Due to the fact that the significance level was lower than .05. this discovery was deemed to be statistically significant.

RESULTS

Three hundred twelve of the 1170 female hypoferritinemia patients who underwent testing exhibited hypoferritinemia while having normal hemoglobin, mean corpuscular volume, red blood cell counts and mean corpuscular hemoglobin levels (figure 1). There were a total of 463 male patients who were evaluated and out of them, 126 were found to have hypoferritinemia without anemia (figure 1). Twenty-one of the 438 patients with hypoferritinemia who did not have anemia were underweight, 369 belonged to the normal weight category, 26 patients belonged to the overweight category and 22 patients belonged to the obese category. 1.6-1, with women in the majority. All of the individuals who were diagnosed with hypoferritinemia but did not have anemia had lower levels of ferritin in their serum. However the results of their CBC were within the normal range.

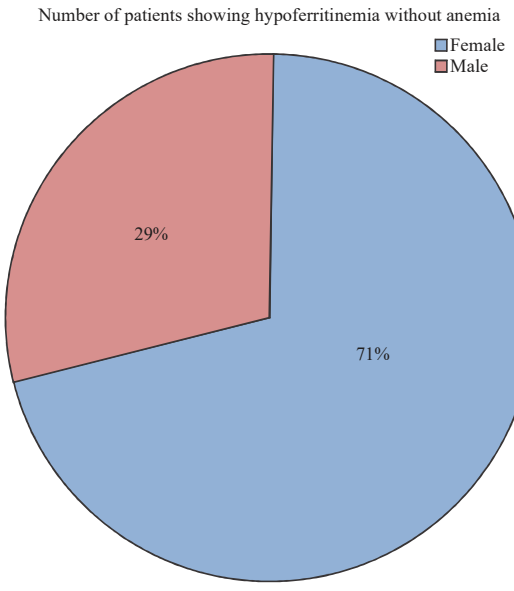

Fig. 1: Pie-chart showing number of patients affected with hypoferritinemia without anemia

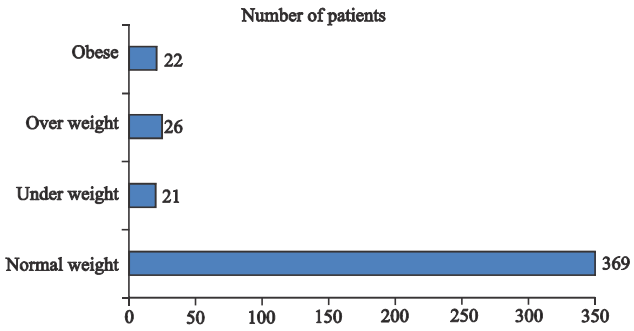

Fig. 2: Showing number of patients affected with hypoferritinemia without anemia according to their weight

Included in this were the mean corpuscular volume (MCV) mean corpuscular hemoglobin (MCH) hematocrit (Hct) hemoglobin (Hb) and red blood cell count (RBC). Table 1, available here, provides further information on the specific findings.

DISCUSSION

Thestudy'findingsdemonstratedhypoferritinemia even if the mean corpuscular hemoglobin, hemoglobin levels,redbloodcellcountandmeancorpuscular hemoglobin were all within normallimits(Table 1). Because of this, it is often done consistently when the CBC values fall within the normal range. Serum ferritin testing is not routinely performed in family clinics or primary care settings in many countries. This is especially true when it comes to kid testing. Serum iron, total iron-binding capacity and transferrin saturation are frequently used assays, although the evidence indicates that their sensitivity in assessing iron status is reduced[7-9]. The test with the highest sensitivity level is serum ferritin. The published medical literature has addressed the topic of low serum ferritin levels together with a normal CBC. This condition has been identified as a latent form of IDA, indicating that it is a covert or preliminary manifestation of IDA. The user's writing already has an academic tone, thus it doesn't need to be revised. The aim of this study was to categorize as distinct disorders the situations in which individuals with low serum ferritin levels had normal complete blood count (CBC) results. This is important because, despite undergoing recurrent venesection treatment for polycythemia, some people may exhibit a syndrome known as high-normal with anemia and not progress to IDA. This is true even when a separate sickness was the sourceof the polycythemia. Threehundredtwelveofthe1170female hypoferritinemia patients that underwent testing exhibited hypoferritinemia while having normal hemoglobin, mean corpuscular volume, red blood cell counts and mean corpuscular hemoglobin levels. Out of the 463 male patients that underwent investigation, 126 had a diagnosis of hypoferritinemia without anemia. Out of the 438 individuals with hypoferritinemia who did not have anemia, 21 were underweight, 369 were in the normal weight range, 26 were overweight and 22 were obese. 1.6-1 ratio in the female's advantage, with a 0.018 percent prevalence rate. Normal reference ranges for hemoglobin, hematocrit, mean corpuscular volume, red blood cell count and mean corpuscular hemoglobin are detected in individuals with hypoferritinemia in cases when anemia is not present (Table 2). Hypoferritinemia can also be accompanied by possibly higher hemoglobin levels. Patients who have hypoferritinemia but do not have anemia typically appear with recurrent symptoms that cannot be diagnosed, such as general weariness, depressed mood and baldness. The user did not supply any content that needed to be rewritten. According to the findings of this research, hypoferritinemia that was not accompanied by anemia or IDA should be considered its own unique condition. Anemia, as well as abnormalities in CBC values and particular hematological and morphological changes in the peripheral blood film, are all hallmarks of IDA. In addition, IDA is distinguished by its presence. On the other hand, hypoferritinemia without anemia does not show any signs of anemia and does not show any alterations in either the morphological or CBC parameter profiles. In addition to this, it is important to point out that IDA is easily identifiable because of the microcytic hypochromic anemia that is characteristic of the condition. In contrast, hypoferritinemia without anemia presents as a concealed illness since it has normal features on a CBC and has a picture that is normocytic and normochromic when seen via a light microscope. This makes the condition difficult to diagnose. In order to raise thetaccuracy of diagnoses, improve treatment techniques and assure adequate monitoring and follow-up, both patients and healthcare professionals should strengthen their knowledge and awareness of hypoferritinemia without anemia. Hypoferritinemia without anemia is recognized as a distinct clinical disorder that can appear as chronic symptoms that go untreated, including a general sense of malaise and sensations of weakness.

Hypoferritinemia without anemia can develop in myeloproliferative neoplasms such as Polycythemia rubra vera, early myelofibrosis and other disorders that are associated to IDA. This condition is known as latent IDA. Latent IDA is a condition that arises when IDA is present but is not actively advancing. The user's material does not need to be rewritten because it already has an academic tone. It is advised that individuals with hypoferritinemia who do not have

Table 1: Hypoferritinemia without anemia affects both genders equally, although in different ways. Typical values for a full blood count

Parameter	Serum ferritin	RBC	Hb	Hct	MCV	MCH
Female (n = 312) range	5.8-10.3	4.5-4.8	128-138	0.38-0.41	88-92	29-31
Male (n = 136) range	12.8-23	4.9-5.4	139-158	0.43-0.48	88-94	29-32

Table 2: What sets iron deficiency anemia apart from hypoferritinemia that does not cause anemia

Variable	Serum ferritin	Anemia	Signs and symptoms	Morphological changes	RBC	Hb	Hct	MCH	MCV
IDA	Low	Yes	Yes	Yes	Low	Low	Low	Low	Low
hypoferritinemia without anemia	Low	No	Yes	Normal	Normal	Normal	Normal	Normal	Normal

anemia improve their participation in public and community health education activities. Both hepcidin and the transferrin receptor play important roles in the control of serum ferritin levels as well as iron metabolism and absorption. As a result of the incorporation of innovative research techniques into IDA investigations, there has been an uptick in interest in this area, which is referred to as hypoferritinemia without anemia.

CONCLUSION

A separate nomenclature is required for the hematological disease known as hypoferritinemia without anemia so that it may be distinguished from iron deficiency anemia (IDA). In spite of the fact that both illnesses have the feature of having low serum-ferritin levels, they are considered to be distinct pathological entities. When an individual does not acquire anemia while having hypoferritinemia, this does not necessarily point to the presence of implicit IDA. This phenomenon can be seen in people who do not develop anemia. Nevertheless, serum ferritin testing is a diagnostic tool that is both inexpensive and accurate in determining the early manifestations of iron shortage. The availability of serum ferritin is not only convenient but it also provides information that is superior to that provided by other iron indices. The serum ferritin test is an extremely helpful tool for identifying iron deficiency in symptomatic people who do not have anemia.

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