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Prevalence of Anemia in Gynecological in-Patients in our Hospital: A cross-Sectional Study

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Abstract

Aim: The goal of this study was to find out how common anemia is among gynecological in-patients at our hospital.

Study design: A cross-sectional study

Place and Duration: This study was conducted at Government Employee CDF hospital Hyderabad Pakistan from April 2020 to April 2021

Methodology: Using a self-designed research proforma, data on all patients admitted to the gynecology ward in designated time were collected prospectively. All patients' hemoglobin levels were measured at admission and discharge, and their therapy was monitored until they were discharged. SPSS version 25 was used to analyze the data.

Results: During the study period, 76.83 percent of the participants had anemia. The lowest hemoglobin level was seen in pregnant women with trophoblastic illness. Premenopausal women had more anemia at presentation than postmenopausal women (88.66 percent vs 11.34 percent, p = 0.07), although there was a statistically significant difference in anemia at discharge (95.8 versus 4.21, p< 0.001). There was also a significant difference in the transfusion trigger at hemoglobin level (6.0g/dl for premenopausal versus postmenopausal (88.37 versus 11.63 percent, p = 0.003), as well as those who had an infection as a co-morbidity (p = 0.03) and those

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who had chemotherapy as a treatment modality (p = 0.05). Regarding transfusion as a method of anemia care, there was no difference between the two groups of women.

Conclusion: Anemia is widespread among gynecology in-patients as a result of circumstances related to the disease's etiopathogenesis and, in certain cases, the disease's therapy. Due to the stringent transfusion approach used and the World Health Organization's hemoglobin level criterion of 12g/dl, all patients hospitalized as anemic were discharged at the same time.

Keywords: Anemia, hemoglobin, gynecological inpatients, transfusion trigger.

Introduction

Anemia has remained a serious public health problem across the world, particularly among women of reproductive age and beyond in resource-constrained nations. Anemia occurs when the amount of red blood cells (and hence their oxygen-carrying capacity) is insufficient to satisfy the body's physiologic requirements [1]. Age, gender, residence elevation above sea level (altitude), smoking behavior, and different phases of pregnancy all influence physiologic demands.

Anemia is defined as hemoglobin levels less than 12g/dl in women, according to the World Health Organization (WHO). The distribution of normal hemoglobin, on the other hand, varies significantly depending on the environment, sex, ethnicity, culture, and physiological health. According to ethnicity, gender, and age, new lower limits for normal hemoglobin readings have been proposed. Anemia is a multifactorial condition that is not self-contained [2].

Despite recent research casting doubt on WHO's definition, it remains the gold standard for epidemiologic and clinical investigations, as well as objective clinical practice [3]. A crucial question is whether different normal values should be used for postmenopausal and elderly women. "Aging is linked with a gradual decline in hemopoietic reserve due to depletion of pluripotent stem cells, increased circulation of catabolic cytokines, and probable modifications in the microenvironment and hemopoietic growth factor synthesis," Baducci et al [4] said. hemopoiesis may reflect general age-related changes in numerous ways."

The global prevalence of anemia was estimated to be 56 percent on average, with a range of 35 to 75 percent depending on geographic region [5]. The prevalence of anemia is among the highest in the world in Sub-Saharan Africa, echoing the region's overall high rates of poverty and malnutrition [6]. The prevalence rate in Nigeria was 62 percent. Anemia's incidence and prevalence rise with age, peaking in institutionalized populations [7] and [8]. Nutritional anemia is more common in third-world nations for social, racial, and economic reasons. In a population with a high frequency of chronic infestations (helminthiasis) and illnesses such as malaria, TB, and acquired immune deficiency syndrome, chronic anemia of chronic disorders is common [9].

While anemia caused by acute or chronic blood loss is well-known, anemia caused by the cumulative consequences of inflammation and the immune system is less well-known [10]. As a

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result, iron consumption is impeded, erythroid progenitor cell development is suppressed, and erythropoietin synthesis is insufficient." Cancer-related anemia is a symptom that can accompany the course of cancer and is commonly detected in individuals with advanced stages of the disease. It can happen on its own when antineoplastic medicines are given. Cancer patients have been shown to have abnormally low amounts of circulating erythropoietin for their anemia levels. Furthermore, in cancer-related anemia, the lifespan of red blood cells is limited, and the generation of new cells cannot compensate for the shortened survival period [11] and [12]. Some malignancies are linked to bleeding that is either visible or hidden or both.

The kind, form, and length of cancer, as well as the treatment regimen and severity, the presence of infection, and the requirement for surgical intervention, are all factors that may raise the risk of anemia in cancer patients. Anemia appears to be more common in individuals with uterine–cervical malignancies and those with cancer-related renal impairment. "After chemotherapy, almost all cancer patients get moderate anemia, and around 80% develop more significant anemia." [13] [14]

A patient's capacity to tolerate anemia is determined by her clinical state as well as the existence of any severe co-morbidities. Anemia lowers the quality of life by causing pallor, weakness, dizziness, tachycardia, poor renal function, heart failure, functional and cognitive deterioration, particularly in the elderly [8] [12]. Anemia increases the likelihood of chemotherapy-induced toxicity and reduces treatment responsiveness in cancer patients. Patients with anemia had a lower response to radiation treatment for cervical cancer.

Transfusions of red blood cells are a quick and dependable way to treat anemia, especially in life-threatening situations. However, there are major differences between red blood cell transfusions performed in normal and crisis treatment. While there is no universal transfusion trigger, “current guidelines for critically ill and pre-operative patients advised that, at hemoglobin values of 7g/dl, red blood cell transfusion is strongly indicated whereas, at values greater than 10g/dl, blood transfusion is unjustified. The transfusion trigger should be based on clinical signs and physician consideration for patients with hemoglobin readings in the range of 7-10g/dl" [15] [16]. However, there are still questions about the best hemoglobin concentration for individuals with the severe cardiorespiratory illness.

The use of restricted vs liberal red blood cell transfusion in severely sick patients is another topic in red blood cell transfusion. Herbert et al [17] [18] and Mercadante et al [11] working independently reported: “that neither mortality nor development of organ dysfunction was affected by the transfusion strategy but using restrictive strategy was at least as effective as and superior to a liberal transfusion strategy with the possible exception of patients with acute myocardial infarction and unstable angina”. Infections, transfusion responses, and a worsening cancer result have all been linked to blood transfusion.

It is recommended that anemia be treated with hematinics and erythropoietin if it is not life-threatening. Reverse anemia caused by relative erythropoietin insufficiency using erythropoietin

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and erythropoietin stimulators, epoetin alpha and beta, and darbepoetin, notably in cancer patients [15] [16]. According to Seidefeld et al [19], epoetin treatment reduced the percentage of patients who needed to be transfused by 74 percent, while Dunphy et al [20] observed a 50 percent reduction in the requirement for transfusion. Patients receiving non-platinum chemotherapy and epoetin required fewer transfusions than those getting just chemotherapy, according to Littlewood and colleagues.

The importance of anemia in medical practice and the scarcity of research among gynecological patients in our population sparked an interest to compare anemia between different gynecological diseases, investigate the impact of treatment modalities on anemia in gynecological patients, and compare the pattern of anemia in reproductive age and postmenopausal women.

Methodology

This study was conducted at Government Employee CDF hospital Hyderabad Pakistan from April 2020 to April 2021. Permission was taken from the ethical review committee of the institute.

All gynecological patients admitted to the ward throughout the research period were recruited at the time of admission and tracked until discharge. Each patient's hemoglobin levels at admission and discharge, treatment modalities such as antineoplastic medicines, and blood transfusion units were gathered and put into a self-designed research proforma. The HemoCue Hb 801 hemoglobin photometer technique was used to determine the hemoglobin levels. After being washed with methylated spirit and then rubbed dry, the middle or ring fingers were utilized. A lancet puncture was made at the tip of the finger, and the initial 2 to 3 drops of blood were wiped away before gently squeezing the finger until there were enough droplets of blood to fill the micro cuvette. The blood was collected in a microcuvette to ensure that it was correctly filled and that there were no bubbles. It was then run through the HemoCue machine, and the results were recorded. All co-morbidities were thoroughly evaluated, and treatment methods were implemented as needed.Patients with ovarian hyperstimulation syndrome were excluded from the study due to the frequent change of their hemoglobin levels with hemoconcentration. Patients with hemoglobinopathies and with a documented medical history of bleeding disorders were also excluded.

The WHO value of less than 12g/dl was used to characterize anemia. The SPSS program was used to conduct the statistical analysis (statistical package for social sciences, SPSS v 25.0, Chicago, IL). The chi-square test was used to determine statistical significance, with a p-value of 0.05 deemed significant.

Results

A total of 436 patients were studied. Patients who were single, married, or widowed numbered 121, 284, and 31, respectively, with percentages of 27.75, 65.14, and 7.11, respectively. Muslims made up 87 percent of the total patients studied, Hindus 7.7%, and Christians Witness 5.3

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percent.Patients with gestational trophoblastic disease (GTD) and ectopic pregnancy had the lowest hemoglobin levels on admission (8.1 ± 1.7 vs 8.3 ± 2.3) and received the most blood transfusion units (4.3 ± 2.2 vs 2.2 ± 1.7), as shown in Table 2. At discharge (9.3 ± 0.4 and 0.7 respectively), the lowest hemoglobin levels were found in ectopic pregnancy and gestational trophoblastic illness. Most time spent in the hospital was for ovarian cancer and gestational trophoblastic illness.

Anemia was found to be prevalent in 76.83 percent of the population, according to WHO standards of 12.0 g/dl. Premenopausal women were more likely than postmenopausal women to be admitted with normal hemoglobin levels (≥ 12.0 g/dl) (p-value =.009), and they were also more likely to be observed as anemic (Hb ≤ 11.9 g/dl) (p-value=0.001). Premenopausal patients were more likely than postmenopausal women to be hospitalized with severe anemia (Hb ≤ 6.0 g/dl) (90 percent versus 10%, p-value = 0.003). When 1 to 2 and >5 units of blood was transfused, there was no statistical difference between the two groups in terms of the number of units transfused. Infection as a co-morbidity (P=0.01) and chemotherapy as a treatment method (P=0.03) were both statistically significant in aggravating anemia.

In terms of blood transfusion, there was a statistically significant difference between women of reproductive age and postmenopausal women (77 percent versus 23 percent, p = 0.05). In terms of hematinics alone (85.71 against 14.19 percent, p = 0.11) and hematinics with blood transfusion (82.14 versus 17.86 percent, p = <0.001), there was no statistically significant difference between premenopausal and postmenopausal women. Erythropoietin or parenteral iron were not used to treat any of the patients. When no therapy (observation) was used in the management of anemia, there was a statistically significant difference between women of reproductive age and postmenopausal women (100 percent vs. 0 percent, p-value = 0.003). There were no erythropoietin/derivatives or parenteral iron in any of the patients.

Table 1: Sociodemographic Characteristics of the study participants

Characteristics	**Number**	**Percentage**
Age (years)		
15-20	18	4.13
21-30	145	33.26
21-40	133	30.50
41-50	55	12.61
51-60	38	8.72
61-70	22	5.05
71-80	21	4.82
81-90	4	0.92

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Educational Status		
No formal education	41	9.4
Primary	95	21.79
Secondary	153	35.1
Tertiary	147	33.72
Reproductive Age		
Premenopausal	345	79.13
Postmenopausal	91	20.87

Table 2: Hemoglobin level and its distribution among disease conditions, duration of hospital stay, and blood transfusion

characteristics	**number**	**% of total**	**Mean admitting Hb level**	**Mean Hb level at discharge**	**Mean units transfused**	**Duration of hospital stay (days)**
Abortions	57	13.1	9.7 ± 2.4	10.2 ± 1.6	1.6 ± 2.4	6.6 ± 8.3
Ectopic pregnancy	84	19.3	8.3 ± 2.3	9.3 ± 0.4	2.2 ± 1.7	5.5 ± 0.9
Ovarian cyst	32	7.33	11.4 ± 1.2	10.2 ± 1.7	0.5 ± 1.2	7.9 ± 6.4
Uterine fibroids	78	17.9	11.6 ± 2.2	10.2 ± 1.2	0.8 ± 1.7	6.3 ± 1.3
Endometrial Polyps	11	2.5	10.8 ± 0.7	10.2 ± 0.6	1.8 ± 2.4	3.4 ± 0.7
GTD	28	6.4	8.1 ± 1.7	9.9 ± 0.7	4.3 ± 2.2	21.5 ± 15.2
Endometriosis	3	0.7	10.17 ± 2.5	10.2 ± 1.4	1.8 ± 2.2	5.7 ± 1.2
Endometrial CA	7	1.61	11 ± 1.8	10.5 ± 0.5	1.2 ± 1.4	8.2 ± 1.7
Cervical CA	76	17.4	10 ± 2.2	10.1 ± 0.8	2.5 ± 2.6	5.8 ± 1.2
Ovarian CA	35	8.03	10.2 ± 2.5	10.2 ± 1	3.4 ± 3.3	22.3 ± 13.2
Vulva CA	1	0.23	9.8 ± 2.1	10.1 ± 0.8	2.2 ± 1.4	5.8 ± 2.9
VVF	24	5.5	11.3 ± 0.6	11.3 ± 1.2	1.6 ± 0.6	13.8 ± 4.4
All Cases	436		10.19± 1.85			

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Table 3: Hemoglobin level and transfusion trigger in reproductive age compared with postmenopausal

Characteristics	Number	% Of total	Women of reproductive age (%)	Postmenopausal women (%)	P-value	Chi-square
Hb Level at admission						
≥12.0g/dl	101	23.17%	85 (84.16)	16(15.84)	0.009	28.02
≤11.9g/dl	335	76.83%	29 (88.66)	38(11.34)	0.07	39
Hb Level at discharge						
≥12.0g/dl	32	7.34%	25(78.13)	7(21.87)	0.47	6.74
≤11.9g/dl	404	92.66%	387(95.8)	17(4.21)	< 0.001	49.8
Transfusion Trigger						
≥6.0g/dl	43	22.51%	38(88.37)	5(11.63)	0.003	26.23
6.1 – 9.0g/dl	148	77.49%	117(79.05)	31(20.95)	0.3	15.63
No of units transfused						
1 – 2	66	34.2%	55(83.33)	11(16.67)	0.71	0.21
3 – 4	80	41.45%	63(78.75)	17(21.25)	1.2	0.007
>5	47	24.35%	33(70.21)	14(29.79)	0.52	0.52

Table 4: Comorbidities/treatment modality complicating anemia among the patients

Characteristics	Yes (%)	No (%)	P-value
Infection	41(12.24)	294(87.76)	0.01
HIV	27(8.06)	308(91.94)	0.71
Malaria	33(9.85)	302(90.15)	0.52
Hemoglobinopathies	4(1.19)	331(98.81)	0.98
Gastrointestinal Loss	2(0.6)	333(99.4)	0.95
Chemotherapy	48(14.32)	287(85.67)	0.03

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Table 5: Mode of treatment of anemia in reproductive age compared with postmenopausal patients

Characteristics	Number	% Of total	Women of reproductive age (%)	Postmenopausal women (%)	P-value	Chi-square
Blood transfusion	198	45.41	153(77.3)	45(22.7)	0.05	4.32
Haematinics alone	224	51.38	192(85.71)	32(14.29)	0.11	2.31
Haematinics+ blood transfusion	196	44.95	161(82.14)	35(17.86)	<0.001	2.27
Parenteral iron	0	0	0	0	—	—
Erythropoietin	0	0	0	0	—	—
Observation	11	2.52	8(72.75)	3(27.27)	0.003	8.4

Discussion

Using the World Health Organization's 12.0g/dl as a standard, the incidence of anemia in this study was 76.83 percent, which is similar to other authors' results [2] [9] [18] but higher than other researchers' reports [6] [19]. The high incidence observed can be attributed to two factors: I active bleeding per vaginum at presentation, in which case a large number of cases may already be anemic due to hemorrhage, and (ii) the hyperendemicity of malaria in our environment, in which case some patients were already anemic [21].

Despite therapy and/or transfusion, all of the individuals hospitalized as anemic were discharged anemic. The fact that no transfusion was given at hemoglobin levels of 10–12g/dl and the maximum transfusion trigger was set at 6.1–9g/dl indicates that the restricted transfusion strategy was used. Other writers [6] [11] [16] have reported similar findings. All of the patients were discharged anemic due to the use of a limited transfusion approach. "The choice to proceed with blood transfusion is a composite one that incorporates cognizance of the hemoglobin level, overall clinical context, avoidance of blood-borne illnesses, patient consent and preferences, and evaluation of other therapy," according to best practice. [15] [16] are two examples. The limited red blood cell transfusion strategy is advised when transfusion is required, as shown in the study [19]. Haematinics were given to all transfused patients to help the body create and treat residual anemia.

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This study found that gestational trophoblastic illness, followed by ectopic pregnancy, is the two gynecological disease conditions that are most likely to cause severe anemia. This is because these ailments are linked to severe bleeding, whereas gestational trophoblastic disease and ovarian cancer are the diseases that are more likely to necessitate transfusions of larger blood units. This might be due to the fact that our hospital is a referral facility, as well as the fact that erythropoietin was not employed in the treatment of cancer patients. Chronic anemia and a prolonged stay in the hospital are also linked to the latter two illness states.

In comparison to women of reproductive age, postmenopausal women had no higher risk of anemia, according to this study. This supports the findings of Inelmen et al [22]. Premenopausal women are more likely than postmenopausal women to be discharged anemic. This was mostly owing to gestational trophoblastic illness and ectopic pregnancy, which are the two conditions that induce the most severe anemia in this population. These disorders will very probably arise in postmenopausal women as a result of the introduction of in vitro fertilization.

Despite the fact that erythropoietin has been shown to be effective in the treatment of anemia in cancer patients [17], none was employed, owing to a lack of supply, expense, and sustainability. Combining it with chemotherapy will almost certainly raise the expense of treatment, posing a sustainability concern. Parenteral iron was also not utilized to treat anemia since it has no better therapeutic impact than dietary iron in terms of boosting hemoglobin levels and is linked to allergic responses, infusion site reactions such as discomfort, extravasation, and injection site discoloration, injection abscess, and necrosis.

In this study, the only major factors to anemia were infections and chemotherapy. Other studies [22] [23] have reported similar findings. Despite the fact that malaria is common in our location, it was not a significant co-morbidity in our research that caused anemia since it was rapidly diagnosed and treated in patients with fever.

Conclusion

Environmental variables and elements inherent in the etiopathogenesis of the disorders contributed to the high rate of anemia among gynecological patients. Premenopausal women are more likely than postmenopausal women to be hospitalized and discharged with anemia for the diseases/conditions studied. All gynecological patients who require transfusions to manage anemia were discharged as anemic due tothe restricted transfusion approach.

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CONFLICT OF INTEREST

None

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PERMISSION

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