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Original Article

Frequency of Anemia among Patients of Rheumatoid Arthritis: Cross Sectional Study

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ABSTRACT

Anemia of inflammation is the common manifestation of chronic inflammatory diseases like rheumatoid arthritis. There is a lack of local data regarding this heath issue so we conducted this study order to assess the frequency of anemia among RA patients. Our results will help clinicians to manage anemia actively with chronic inflammatory disorders in our clinical setups. **Objective:** To evaluate the frequency of anemia of inflammation in rheumatoid arthritis patients. **Methods:** Both male and female patients having age 40-70 years with confirmed rheumatoid arthritis were enrolled. Patients with history of any previous blood loss or any co-morbidities like CLD, CRF and thalassemia were ruled out. Blood sample drawn from each patient was sent for laboratory measurement of hemoglobin levels thus indicating the presence or absence of anemia. **Results:** Mean age was 50.85 ± 9.07 years. Out of the 79 patients, 63 (79.75%) were female and 16 (20.25%) were females. Frequency of anemia in rheumatoid arthritis was found in 64 (81.01%) patients, whereas there was no anemia in 15 (18.99%) patients. **Conclusions:** It was concluded that anemia is a common disorder and its frequency is very high among patients of rheumatoid arthritis.

INTRODUCTION

Rheumatoid arthritis is an inflammatory autoimmune disease that involves many joints of body. According to an estimate this disease affects about 1% of the adult population globally [1]. Joints usually involve wrists, hand and elbows symmetrically. Patho-physiology of disease involved hyperplasia of synovial fibroblasts that cause bone and joint destruction [2]. As this is an autoimmune disease, cytokines and other mediators of inflammation play vital role in developing systemic manifestations of this disease [3]. Literature review revealed that globally, its annual incidence is approximately 3 cases per 10,000 populations with prevalence rate is approximately 1% [4]. Various factors increase its incidence like aging, smoking, alcohol abuse, trauma and medications. This disease is less prevalent among blacks due to different genetic makeup in comparison to other races [5]. However, family members of victim are at high risk of developing disease due to same genetics. Hence, genetic factors and immune system abnormalities contribute to disease propagation [2]. Sex hormones may play a role in RA, as evidenced by the disproportionate number of females with this disease, its amelioration during pregnancy, its recurrence in the early postpartum period, and its reduced incidence in women using oral contraceptives. Hyperprolactinemia may be a risk factor for RA [6]. Anemia of inflammation is the common manifestation of chronic inflammatory diseases like rheumatoid arthritis. Literature review revealed that anemia of inflammation and iron deficiency anemia in combination cause extreme breathlessness among RA patients. Main pathology that cause iron

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deficiency anemia involved changes in iron metabolism with reduced formation of iron carrying protein like serum ferritin and storage protein serum hepcidin [7]. As a result, the pro-inflammatory cytokines, primarily interleukin-6 are released thus causing inflammation of involved joints [4]. Previous literature review has shown that most common extra-articular manifestation is low hemoglobin levels among patients of RA [8, 9]. As previous studies have shown controversy and variation in frequency of anemia in rheumatoid arthritis in different populations.

The objective of current study was to evaluate the frequency of anemia of inflammation in rheumatoid arthritis patients. Our results will provide local magnitude as well as help to design guidelines for early recognition and management of this condition.

METHODS

This cross-sectional study was conducted at medicine department CDA Hospital Islamabad for six months from 1st September 2017 to 31th March 2018 after approval of synopsis by research evaluation unit of CPSP vide Ref No. CPSP/REU/MED-2015-253-10187 dated 07.03.2019. Total of 79 patients of rheumatoid arthritis through non-probability, consecutive sampling having age 40-70 years and both genders were included. Sample size was determined by the formula $n= Z^2 P(1-P)/d^2$. Where z= 1.96, P= 28.8, and d= 10%. Patients with any previous blood loss, CLD, CRF and thalassemia were excluded [11]. Blood sample drawn from each patient was sent for laboratory measurement of hemoglobin levels thus indicating the presence or absence of anemia. Hemoglobin levels of 10.0 g/dL or lower indicate anemia [10]. All information was recorded in performa. SPSS version 20.0 analyzed the data. Mean ± SD was calculated for age and duration of RA. Frequency and percentage was calculated for quantitative variables like gender, socioeconomic status. Post-stratification Chi square was applied with p-value of < 0.05 taken as significant.

RESULTS

Baseline parameters like age and duration of disease was shown in table I. Mean duration of RA was 95.82 ± 77.42 months.

Table 1: Baseline Parameter among Enrolled Patients

Variables	Groups	Percentage (%)	Mean + SD
Age (Years)	40-55	72.15	50.85 ± 9.07
	56-70	27.85	
Duration of Disease (Months)	≤36	27.85	95.82 ± 77.42
	>36	72.15	

Out of the 79 patients, 63 (79.75%) were female and 16 (20.25%) were females (Figure 1).

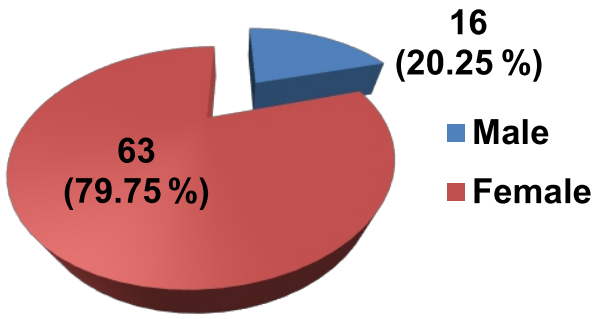

Figure 1: Gender Distribution of Patients

Frequency of anemia in rheumatoid arthritis was found in 64(81.01%) patients as shown in figure 2.

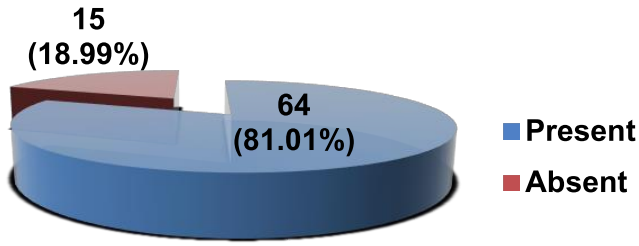

Figure 2: Distribution of Patients with Anemia(n=79)

Distribution of patients with other confounding variables was shown in table-2. Majority of the patients were employed(56.96%) but belong to low socioeconomic status having income less than 50k(92% roughly).

Table 2: Confounding Variables among Patients

Confounding Variables		Percentage (%)
Socioeconomic Status	≤10k	46.84
	20-50k	45.57
	>50k	7.59
Occupation	Employed	56.96
	Unemployed	2.53
	Laborer	40.51

Stratification of anemia with respect to age, duration of RA and education status was shown in table 3. Significant difference was seen among patients having anemia with respect to duration of disease with p-value of 0.04 as shown in table 3.

Table 3: Stratification of Anemia with Respect to Age, Duration of Rheumatoid Arthritis and Education Status

Age (Years)	Anemia (n)		p-Value
	Present	Absent	
40-55	46	11	0.910
56-70	18	04	
Education Status			
Uneducated	33	08	0.902
Educated	31	07	
Duration of Disease			
≤36	21	01	0.042*
>36	43	14	

*Statistically significant

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DISCUSSION

Rheumatoid arthritis is an inflammatory autoimmune disease that involves many joints of body. According to an estimate this disease affects about 1% of the adult population globally [1]. Joints usually involve wrists, hand and elbows symmetrically. Patho-physiology of disease involved hyperplasia of synovial fibroblasts that cause bone and joint destruction [2]. As this is an autoimmune disease, cytokines and other mediators of inflammation play vital role in developing systemic manifestations of this disease [3, 12]. According to many previous studies, anemia prevalence among RA patients ranges from 30-70% among different populations [11, 13]. Our results showed that incidence of anemia among our enrolled patients was 81% thus our results were in line with many previous studies. Previous many studies showed that iron deficiency anemia was on top followed by anemia of chronic disease. Iron deficiency accounted more than 65% cases of anemia among RA patients in many different studies [13, 14]. This prevalence was high among developing countries of overall anemia of Asia like India, SriLanka, Pakistan and Bangladesh. This issue has with a negative impact on both RA symptoms and quality of life [11]. Anemia is associated with a negative impact on both RA symptoms and quality of life [15, 16]. Low erythropoietin levels and a diminished response to erythropoietin have also been shown to contribute to anemia in Rain addition to the role of reticulocyte hemoglobin in causing inflammatory disorders like RA. These observations have led to the use of erythropoietin, iron supplements resulting in improvement of the anemia in some patients [17, 18]. Our results showed that iron deficiency anemia was in majority of our patients. This may be due to low income and lack of awareness thus our results supported findings of previous studies. Present study determined the frequency of anemia in rheumatoid arthritis. Age range in my study was from 40 to 70 years with mean age of 50.85 ± 9.07 years. Majority of the patients 57 (72.15%) were between 40 to 55 years of age. Out of the 79 patients, 63 (79.75%) were female and 16 (20.25%) were females with male to male ratio of 1:3.9. Frequency of anemia in rheumatoid arthritis was found in 64 (81.01%) patients, whereas there was no anemia in 15 (18.99%) patients. In patients with Rheumatoid Arthritis (RA), the prevalence of anemia ranges from 30 to 70 percent [7]. One previous study demonstrated that duration of disease has significant impact of developing anemia. [19]. Results in present study showed significant p-value of 0.04 when duration of disease was stratified for anemia table-3. Thus our results supported above mentioned study. Anemia which is the commonest extra articular manifestation of RA has traditionally not been considered a major problem in RA patients by the vast majority of physicians. This is due to lack literature on its prevalence and effect on various clinical and functional outcomes, including morbidity, mortality, and quality of life [20, 21]. Thus more studies with bigger sample size, duration of study, genetic workup, inflammatory markers and multi-centered research is highly recommended to see its true magnitude of disease.

CONCLUSIONS

This study concluded that frequency of anemia in rheumatoid arthritis is very high (81.01%) patients, whereas there was no anemia in 15 (18.99%) and also reduced level of hemoglobin is associated with duration of disease. So, we recommend that early recognition and management of this condition should be done in rheumatoid arthritis patients in order to improve the quality of life of these particular patients.

Authors Contribution

Conceptualization: HA, AS
Methodology: SAW, SI
Formal analysis: HA, AS, HMM, YA
Writing, review and editing: HMM, YA

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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