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Research Article

Analysis of different types of manifestations of anemia in rheumatoid arthritis patients

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ABSTRACT

Background: Rheumatoid arthritis is chronic autoimmune disease that affected small joint in the hand and feetcausing swelling that can result in bone erosion and joint deformity, anemia is the most common and serious blood abnormality seen in rheumatoid arthritis. Aim of this study was assessment of anemia in rheumatoid arthritis patients, differentiated between the types of anemia and correlation between anemia and du ration of rheumatoid arthritis. **Material and method:** This cross sectional study was conducted in Liaquat University Hospital during January 2018 to October 2018. A total of 100 samples were obtained,among them 50 patients diagnosed with rheumatoid arthritis 50 samples were collected from healthy subjects as control.Fifty informed male and femaleconsented patients diagnosed with Rheumatoid arthritis were recruited for the study.Rheumatoid arthritis Patients withchronic disease and such (renal failure, heart disease, liver disease, malignant diseases) were also excluded.**Result:** (60%) of rheumatoid arthritis are anemic and (40%) non-anemic the result demonstrated that the Hb level, RBCs and PCV are significantly reduced in anemic rheumatoid arthritis patients in comparison with non-anemic rheumatoid arthritis patients with P value (0.000) for Hb, RBCs and PCV. The result demonstrated also that MCH significantly reduced in anemic rheumatoid arthritis patients in comparison with non -anemic rheumatoid arthritis patients with P value (0.003) while MCV & MCHC are within normal range. In anemic rheumatoid arthritis patients, serum ferritin was significantly reduced in 7 while 23 patients have normal level of serum ferritin. Based on cutoff of 15µg/L for ferritin, 23% of anemic rheumatoid arthritis patients have IDA and 77% have ACD. **Conclusion:** There are two types of anemia in rheumatoid arthritis patients, IDA and ACD. ACD is more common in rheumatoid arthritis patients.

Keywords: Iron deficiency, Rheumatoid arthritis, Anemia of chronic disorder, ferritin.

INTRODUCTION

Rheumatoid arthritis (RA)is chronic autoimmune disease that affected small joint in the hand and feet causing swelling that can result in bone erosion and joint deformity.[1] RA may occur at any age but the prevalence increases until age of 70. The disease Infects 1% to 2% of the adult population and its incidence is greater in women than in men (3:1). Anaemia is the most common and serious blood abnormality seen in rheumatoid arthritis either anaemia of chronic disorder (ACD) or iron deficiency anemia.[2] The main problem in differential diagnosis of ACD in RA is the presence of concomitant iron deficiency.[3] ACD affects between one-half and two-thirds of all people with rheumatoid arthritis. The pathogenesis of the anemia of chronic disease including abnormal release of iron from transferrin to early erythroblast, iron accumulated in reticulo-endothelial cell this failure to release iron from to the erythroblast and that lead to decrease number of red cell blood and erythropoietin deficiency. Iron deficiency may be resulting from non-steroidal antiinflammatorydrug which

cause stomach bleeding leading to iron deficiency.[2,3] Rheumatoid arthritis is one of the most common diseases in Pakistan. Most of the patient can develop anaemia as complication of Rheumatoid arthritis so we want to study this problem to look for the types of anaemia which is important in planning, diagnostic, testing, and in guiding therapy.

AIMS AND OBJECTIVES

The basic aim of the study is to analyze the different types of manifestations of anemia in rheumatoid arthritis patients.

MATERIALS AND METHOD

This cross sectional study was conducted in Liaquat University Hospital during January 2018 to October 2018.A total of 100 samples were obtained,among them 50 patients diagnosed with rheumatoid arthritis. 50 samples were collected from healthy subjects as control.Fifty informed male and femaleconsented patients diagnosed with Rheumatoid arthritis were recruited for the study.Rheumatoid arthritis Patients withchronic disease and such (renal failure, heart disease, liver disease, malignant diseases) were also excluded.

Collection of Blood Samples

Under a septic condition5 milliliters of venous blood will be collected. Then Two milliliters of these were placed in ethylenediethyltetra acetic acid (EDTA) bottles for hematological analysis. The remaining 3 milliliters were taken into universal bottle and centrifuged at 3000rpm for 5 minutes to obtain the serum for Quantitative serum ferritin.

Reference values

Serum ferritin concentration Men 15–300 µg/L (median 100 µg/L) Women 15–200 µg/L (median40 µg/L) Iron deficiency of anaemia (IDA) distinguished from anaemia chronic disease (ACD) was distinguished by ferritin concentration, based on cutoff of 15 µg/L for ferritin level. (IDA) was defined as serum ferritin $\leq$ 15µg/L.

Statistical analysis

Results obtained were analyzedusing SPSS software (version 20) for both the descriptive and inferential analysis. Results were expressed as mean and standard deviation. One way analysis of variance (ANOVA) was used to determine the level of significance.

RESULTS

The result reflect that, 30(60%) out of 50 patients are anaemic and 20(40%) are non anaemic (Table 1). The Hb level ranged from 7g/dl to 11g/dl in anemic rheumatoid arthritis patient with mean ± SD of 8.7g/dl±1.5. For non-anemic patients the Hb level range from 12 g/dl to17 g/dl with a mean ± SD of14.1g/dl ± 1.3, this difference was found to be highly statistically significant with(*p value*=0.000) (table 2).

(Table 3) showed that the mean ± SD of the RBCs count in anemic rheumatoid arthritis patientswas 3.1 ±0.4 $x10^{12}$/L, while the mean ± SD in non-anemic rheumatoid arthritis patients was 4.8 ±0.5$x10^{12}$/L this difference was found to be highly statistically significant with (*pvalu*e=0.000).Females 3.9-5.6 x 1012/L in anemic rheumatoid arthritis patients the PCV with a PCV (haematocrit) Males 40-52% mean ± SD 27.2% ±4.4 while in non-anemic rheumatoid Females 36-48% arthritis patients it was found to be 42.5%±4.9. Unbound substances are then 31.6g/dl±1.0, this difference was found to be removed with ProCell/ProCell M. MCHC in rheumatoid arthritis patients show week negative correlation with duration, MCHC (*p-value* = 0.164).

Table1: Prevalence of anemia in rheumatoid arthritis.

Status	N	Percentage
Non anemic	20	40%
Anemic	30	60%
Total	50	100%

Table 2: Mean of Hb in anemic and non-anemic patients.

Hb (g/dl)	N	Mean	Std. Deviation
Non anemic	20	14.1	1.3
Anemic	30	8.7	1.5
T-test p value = 0.000			

Table 3: Mean of RBCs in anemic and non-anemic patients.

T-test			
RBCs 10^{12}/L	**N**	**Mean**	**Std. Deviation**
Non anemic	20	4.8	0.5
Anemic	30	3.1	0.4
T-test p value = 0.000			

DISCUSSION

Serum ferritin level in anemic rheumatoid patient Out of anemic patients ACD was found (77%) and IDA (23%) This study reflect that, the Prevalence of anemia in our Our result is similar with previous studies. Our result is study was 60%. This finding were correlated with the similar with previous studies.[9-11]

The results also demonstrate there was significant decrease in This study concludes that, there is correlation between anemia and rheumatoid arthritis. The Hb, RBCs, PCV, MCH, was low in rheumatoid arthritis patients. The types of anemia in rheumatoid arthritis patients are IDA or and ACD and Prevalence of ACD greater than IDA.

CONCLUSION

We recommended that CBC and serum ferritin levels must be investigated routinely to avoid the risk of anemia and guiding therapy. However, future research on a larger scale is needed.

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