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HAEMOGLOBIN LEVEL AND PLATELETS COUNT IN ACTIVE RHEUMATOID ARTHRITIS

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ABSTRACT

Aim of the Study: To assess the level of the haemoglobin and the platelet count in patients with active rheumatoid arthritis. **Subjects and Material:** In this study and during a period of eight months, sixty patients with active rheumatoid arthritis, (50) females and (10) males, attending Ibn-Sina teaching hospital in Mosul / the rheumatology department were included. Their ages were ranging between (19-70) years, with the mean of (45.15) years, those patients were diagnosed to have rheumatoid arthritis according to the criteria of the American College of Rheumatology (ACR), and patients were considered to have an active disease according to parameters of assessing disease activity. This study includes clinical evaluation of disease activity depending on the number of inflamed joints and pain intensity (score), assessing the haemoglobin level and the platelet count. **Results:** There was a significant negative correlation between haemoglobin and platelet count and a significant increase in platelet count with disease activity. **Conclusion:** 76.6% were in fourth-sixth decades of life with a female predominance. Anaemia was found in (46.7%) of cases and the degree of anaemia increased with disease activity. The anaemia was mostly of normochromic normocytic type (82.14%). Thrombocytosis was found in (63.3%) of patients and it had a significant positive correlation with Ritchie index ($p \leq 0.05$).

KEYWORDS: Rheumatoid Arthritis, Haemoglobin, Anemia, Platelet, Thrombocytosis.

INTRODUCTION

Rheumatoid arthritis (RA) is a systemic inflammatory connective tissue disease with polyarthritis as a prominent feature. However, extra-articular symptoms and signs are always present. The prevalence of the disease in women is about 1% and in men about 0.5%.[1] The disease can occur at any age but according to common age of occurrence the disease can be categorized into a young-onset RA (YORA) which usually begins between 30 and 40 years of age, whereas RA developing after 60 to 65 years of age is usually called late-onset RA (LORA).[2] With female to male ratio of 3:1.[3]

The diagnosis of the RA is made by clinical observation of the patients, that is depend on the presence of sufficient number of criteria as defined by the American College of Rheumatology (ACR).[4] Anaemia is often present in patients with active RA.[5-7] It is the most common extra-articular manifestation,[8] and the degree of anaemia in RA is related to the activity of the underlying disease and inflammation.[9] Treatment of the underlying activity will usually improve the anaemia.[10,11] It has been reported that RA patients with anemia seemed to have a more serious course and physical disability than those without anemia.[12,13] The most common type of anaemia seen in rheumatoid patients is anaemia of chronic disease (normochromic normocytic) (60–90%) followed by (hypochromic microcytic)(8–30 %).[14,15] The mechanism resulting in anaemia has attracted the attention of numerous investigators.[16] Mild haemolytic tendency of an extra-corpuscular type has been confirmed but it is insufficient to explain the associated anaemia in the presence of adequate marrow compensation.[17] Expanded plasma volume with secondary haemodilution may play a minor role.[18]

Other causes of anaemia are impairment of the release of iron from the reticuloendothelial tissue,[19] sequestration of iron in the inflamed synovial tissue,[20] impairment of iron utilization due to increased lactoferrin which binds

and lowers serum iron, reduced erythropoietin levels, also the increased production of inflammatory cytokines (e.g. tumor necrosis factor) that is observed in RA is linked to a cytokine-mediated decrease bone marrow response to erythropoietin,[16,20] drug associated anaemia specially non-steroidal anti-inflammatory drugs (NSAIDs) induced bleeding and secondary iron deficiency and bone marrow suppression from drug therapy like gold, penicillamine, methotrexate.[14,21] Still other causes of anaemia are intercurrent infection.[17] Decreased iron absorption, where investigations of the upper gastrointestinal tract by endoscopy showed that acute macroscopic lesions are infrequently associated with anaemia.[22]

Thrombocytosis has often been found in association with active RA.[23] Also an association appeared to exist between thrombocytosis and extra-articular manifestation of RA.[24] The Exact pathogenic mechanism(s) that cause increased platelet counts in RA are still unknown. Recent investigations indicate that proinflammatory cytokines of RA have megakaryocytopoietic / thrombopoietic properties. Moreover, several hematopoietic cytokines can also act as acute phase responders and contribute to the inflammation.[25] Thrombopoietin (TPO) is the major regulator of growth and differentiation of megakaryocytes. Recent studies have shown that TPO may also act as an acute-phase reactant, and it has been suggested as a component of inflammatory reactions.[26]

METHODS AND SUBJECTS

Sixty patients with active rheumatoid arthritis (according to the criteria of the American College of Rheumatology), (10) males, (50) females, aged between (19-70) years, with mean (45.15) years, and the disease duration was (1-27) years with mean (6.38) years under treatment, attending Ibn-Sina Teaching Hospital in Mosul were studied during a period of eight months. Patients were considered to have an active disease according to the parameters of assessing disease activity.[11]

Blood Sampling and Processing

A two ml of venous blood sample were obtained and added to EDTA tube to be used for performing haemoglobin level and platelet count.[27]

The mean, standard deviation, range, percentage (%), unpaired t-test, Duncan test and correlation analysis were made by using statistical computer programs: Statistical Package for the Social Sciences (SPSS), P-value of 0.05 or less was considered significant.

RESULTS

The results of this study listed down showing full clinical and hematological data of the patients as demonstrated in the Table1 below with their relevant statistical analysis Fig. 1, Fig. 2, and Fig. 3.

Table 1: Mean, standard deviation and range of parameters.

Parameters	Mean	SD	Range
Age (year)	45.15	11.88	19.00-70.00
Duration (year)	6.38	5.74	1.00-27.00
Haemoglobin (g/L)	119.23	14.41	80.00-155.00
Platelet x 10^9	435.55	113.08	173.00-775.00

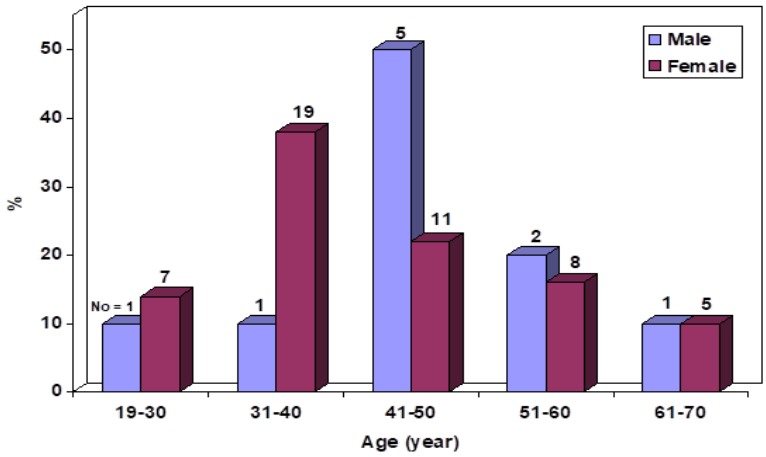

Figure (1): Age and sex distribution of patients.

There was a significant negative correlation between haemoglobin and platelet count as seen in Fig. 2

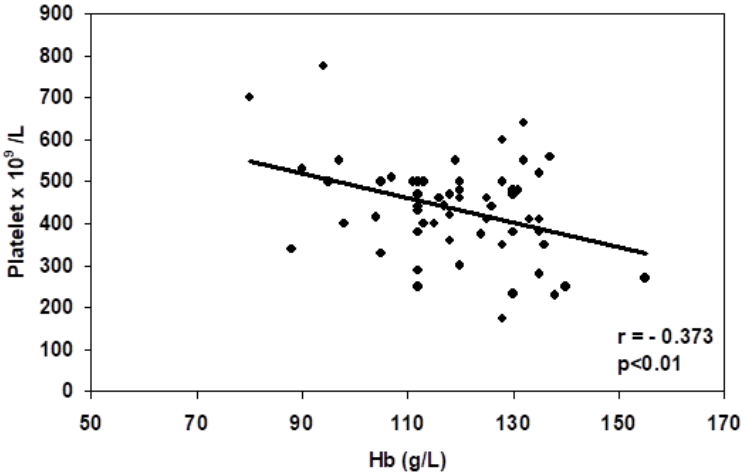

Figure (2): Scatter diagram between haemoglobin and platelet count of patients.

There was a significant increase in platelet count with the increase in the disease activity as shown in Fig 3.

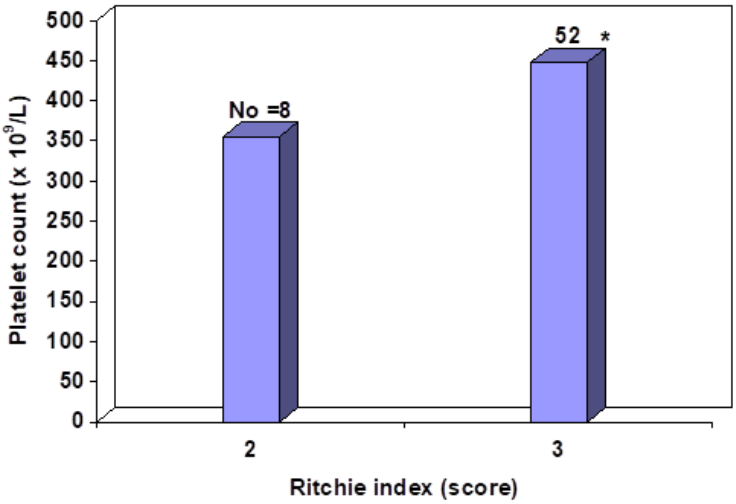

Figure (3): Effect of disease activity (Ritchie index) on platelet count in patients.

DISCUSSION

The age of patients ranged between (19-70) years, with mean of (45.15) years, and the majority of patients (76.6%) were in Fourth to sixth decades of life. This is quite expected as RA is more common in the fourth to sixth decades of life.[10,28] The age range of the patients are between (19 to 70) years, with mean of (45.15) years, (76.6 %) of them were in the fourth to sixth decades of life. This is similar to other studies as RA is more frequent in this period of life.[29] The gender variation shows female to male ratio is 5 to 1 and this distribution of sex agrees with that reported in other studies which revealed that females affected 5 times more than males.[30] Anaemia was found in (46.7%) of our patients, (17.86%) of them had hypochromic microcytic anaemia, while the other (82.14%) had normochromic normocytic anaemia. This agrees with that reported in other studies which stated that anemia develops in 30-70% of patients with RA and the most common type of anaemia seen in rheumatoid patients is anaemia of chronic disease (normochromic normocytic) (60-90%), followed by hypochromic microcytic (8-30%).[7,31] The cause for normochromic normocytic anaemia may be due to reduced erythropoietin levels or decreased bone marrow response to erythropoietin, or may be drug associated specially non-steroidal anti-inflammatory drugs, while the cause of hypochromic microcytic anaemia may be due to impairment of the release of iron from the reticuloendothlial tissue.[17,32] Thrombocytosis was found in (63.3%) of patients, and this agrees with the results of other workers which may be due to proinflammatory cytokines which have megakaryocytopoietic / thrombopoietic properties. Thrombocytosis was shown with the increase of disease activity which is reflected by

Ritchie index, and this is similar to what is reported in some other studies.[33]

CONCLUSION

1) 76.6% of patients were in fourth to sixth decades of life, with male to female ratio of 1:5.
2) Anaemia was found in 28/60 (46.67%) of cases, and it is associated more with disease activity. Anaemia was mostly of normochromic normocytic type (82.14%) and of hypochromic microcytic type in (17.9%).
3) Thrombocytosis was found in (63.3%) of cases and it is correlated negatively with haemoglobin, and also thrombocytosis associated with disease activity as seen from positive correlation between platelet count and Ritchie index score.

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