CORRELATION BETWEEN ERYTHROCYTE SEDIMENTATION RATE AND C – REACTIVE PROTEIN IN ARTHRITIS PATIENTS IN SHENDI LOCALITY – RIVER NILE STATE

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ABSTRACT

Background: Erythrocyte sedimentation rate (ESR) and serum of C-reactive protein (CRP) are the acute phase reactants most commonly determined in patients with rheumatic diseases. The indices are affected by different factors, but both of them are applied for evaluation of the disease activity in patients with inflammatory disorders of the musculoskeletal system. **Methods**: This is a cross-sectional case control prospective analytical study conducted in shendi town to identify the correlation between erythrocyte sedimentation rate and C-reactive protein in arthritis patients in the period between (March to May2018). Venous blood collected using sterile disposable plastic syringe after, 2.5ml of venous blood for ESR citrated blood was added to the anticoagulant and gently mix, while CRP blood was collected in EDTA. **Results:** The result of this study showed that the mean of ESR in test group was (71mm/h), while in control group was (19mm/h), and the mean of CRP in test group was (18mg/l), while in control group was (3.0 mg/l). Also the result of this study demonstrated that the mean of ESR and CRP level was higher in that group of age more than 40 years. **Conclusion**: From this study it appears that there was significant variation in CRP and ESR when compared the test group with control group.

KEYWORDS: Arthritis, ESR, CRP, Sudan.

INTRODUCTION

Arthritis is a joint disorder featuring inflammation. A joint is an area of the body where two bones meet. A joint functions to allow movement of the body parts it connects. Arthritis literally means inflammation of one or more joints. Arthritis is frequently accompanied by joint pain. Joint pain is referred to as arthralgia.[1]

The causes of arthritis depend on the form of arthritis. Causes include injury (leading to degenerative arthritis), abnormal metabolism (such as gout and pseudo gout), inheritance (such as in osteoarthritis), infections (such as in the arthritis of Lyme disease), and an overactive immune system (such as rheumatoid arthritis and systemic lupus erythematosus). Treatment programs, when possible, are often directed toward the precise cause of the arthritis.[2]

Erythrocyte sedimentation rate was probably the most commonly used laboratory test in the 20th century. Currently, the clinical usefulness of ESR is questioned, and the C-reactive protein (CRP) level is widely applied.

C-reactive protein was discovered in 1930 by William S. Tilled and Thomas Francis, and the test has experienced a revival in the last two decades due to the discovery of the role of inflammation in atherosclerotic disease.[3, 4]

Despite the diminished role of ESR in modern diagnostics, the test is still used in rheumatology. Moreover, some disease activity indices are based on either ESR or CRP. This applies to the indices Disease activity score (DAS and DAS28) used to determine activity of rheumatoid arthritis.[5]

The comparative value of ESR and CRP in measuring disease activity was investigated in groups of patients with certain rheumatic disorders. The erythrocyte sedimentation rate and CRP are found to be sensitive markers of disease activity in patients with rheumatoid arthritis, as reviewed by Roof and Stocky.[6]

METHODS

This cross sectional case control prospective analytical study, aimed to correlate erythrocyte sedimentation rate

and C-reactive protein in patients with arthritis. The study conducted in shendi locality River Nile state during the period of (March to May 2018). Venous blood collected using sterile disposable plastic syringe after cleaning the vein puncture area with (70%) ethanol, 2.5ml of venous blood in tri-sodium citrate for ESR, while CRP blood was collected in EDTA, the sample centrifuge at (1300rpm) for (15min) to obtain plasma for (CRP).

Quantitative CRP was measured using a sandwich immunodetection method, by ichroma™ Reader to show CRP concentration in specimen. ESR determined When anti coagulated blood is allowed to stand in a narrow vertical glass tube, undisturbed for a period of time (Westergren technique).

RESULTS

In this study the mean of (ESR) value in test group was (71.08mm/1h), while the mean in control group was (18.96mm/1/2h) as demonstrated in table (1).

Table 1: Show the mean of ESR in test and control group

ESR	N	Mean	Std. Deviation	Std. Error Mean
Test	50	71.08	21.529	3.045
Control	25	18.96	10.175	2.035

Also in this study the mean of (CRP) value in test group was (17.8mg/l), while in control group was (2.87mg/l) as demonstrated in table (2).

Table 2: Show the mean of CRP in test and control group.

CRP	N	Mean	Std. Deviation	Std. Error Mean
Test	50	17.8242	35.67897	5.04577
Control	25	2.8748	.74883	.14977

The mean of (ESR) in age group of (20-40years) was (73mm/1h), while in age group of (41-60years) was (72.65mm/1h), and in age group more than (60 years) was (69.2mm/1h) as noted in table (3).

Table 3: Show the mean of ESR according to age.

Age groups	Mean	N	%
20-40yrs	73.00	4	8.0%
41-60yrs	72.65	23	46.0%
60+ yrs	69.17	23	46.0%
Total	71.08	50	100.0%

The mean of (ESR) value in male was (73.36mm/1h), while in female was (70.44mm/1h) which noted in table (4).

Table 4: Show the mean of ESR according to sex.

Sex	Mean	N	%
Male	73.36	11	22.0%
Female	70.44	39	78.0%
Total	71.08	50	100.0%

The mean of ESR according of duration of disease less than one years was (76.9mm/1h), while in duration from (1-15 years) was (70.08mm/1h), and in the duration from (16-30 years) was (64mm/1h) as demonstrated in table (5).

Table 5: Show the mean of ESR according to duration of disease.

Duration	Mean	N	%
Less than 1yrs	76.90	10	20.0%
1-15yrs	70.08	37	74.0%
16-30yrs	64.00	3	6.0%
Total	71.08	50	100.0%

The mean of CRP in age group of (20-40) years was (20.27 mg/l),while in age group of (41-60) years was (22.72mg/l),and in age group more than (60 years) was (12.49mg/l) as noted in table (6).

Table (6) Show the mean of CRP according to age:

Age groups	Mean	N	%
20-40yrs	20.2775	4	8.0%
41-60yrs	22.7278	23	46.0%
60+ yrs	12.4939	23	46.0%
Total	17.8242	50	100.0%

The mean of (CRP) value in male was (13.66mg/l), while in female was (18.99mg/l) as noted in table (7).

Table (7) Show the mean the mean of CRP according to sex.

Sex	Mean	N	%
Male	13.6682	11	22.0%
Female	18.9964	39	78.0%
Total	17.8242	50	100.0%

The mean of CRP according of duration of disease less than one years was (46.8mg/l), while in duration from (1-15) years was (11.09mg/l), and in the duration from (16-30) years was (4.21mg/l) as demonstrated in table (8).

Table 8: Show the mean of CRP according to duration of disease.

Duration	Mean	N	%
Less than 1yrs	46.8040	10	20.0%
1-15yrs	11.0957	37	74.0%
16-30yrs	4.2100	3	6.0%
Total	17.8242	50	100.0%

DISCUSSION

The arthritis disease that inflammatory condition, is very common but is not well understood actually, it's not a

single disease, it is an informal way of referring to joint pain or joint disease.

The results of this study obtained demonstrated that the mean of ESR value in test group is higher, when compared with the control group. Statistical analysis shows that there was significant variation.

While the mean of (CRP) value in test group was also higher when compared with the control group which is low. Statistical analysis demonstrated that there was strong significant variation.

These results were similar to the result of study conducted by L walsh, P Davies and B McConnky.[7]

The mean of ESR in age group of (20-40 years) and (41-60 years) is above from age group more than (60years). Statistical analysis noted that there was no significant variation. While the mean of CRP for the age group of (20-40 years) and (41-60 years) is higher than that of age more than 60 years. Statistical analysis demonstrated that there was no significant variation.

This results were similar to the result of study done by Anna Kotulska, Magdalenakope and his colleagues in USA at 2015 showed the patients older than 40years had higher CRP.[8]

The present study revealed that the mean of (ESR) in male and female present simple different. Statistical analysis indicated that there was no significant variation. This result are similar to the result study done by Anna Kotulska, Magdalena and his colleagues' in USA at 2015 whom revealed that there was no difference in (ESR) between male and female patients.[8]

The mean of CRP in male and female demonstrated by present of simple difference. Statistical analysis noted that there was no significant variation. This result are similar to the results done by Anna Kotulska, Magdolena and his colleagues in USA at 2015 whom revealed that there was no difference in (CRP) between male and female patients.[49]

The mean of (ESR) according to duration of disease less than one year is higher than duration from (1-15) years, and the duration from (16-30) years. Statistical analysis showed that there was no significant variation.

The mean of (CRP) according to duration of the disease less than one year also is higher than other durations. Statistical analysis noted that there was no significant variation.

This study clarified there is strong correlation between ESR, CRP and arthritis disease.

CONCLUSION

By the end of this study we observed that the C-reactive protein level and ESR value was higher in arthritis patients compared to healthy individual. Also the arthritis disease was wide distributing in female rather than male.

Also C-reactive protein level and ESR value was higher in older age more than 40 years and the duration of arthritis disease can be effect in ESR and CRP.

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