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"Pathophysiological progression of Arthritis; A 50 Cases prospective research"

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Abstract:
Background: *Arthritis is normally observed as a disease caused as result of inflamed joints. Inherently, it is not just a single disease rather a collection of medical problems collectively termed as "Arthritis". In case of arthritis, mainly the suffering starts due to faulty joints. It has a high commonness universally and which includes over 100 types, the most well-known are rheumatoid joint pain (RA), osteoarthritis (OA) and inflammatory arthritis. All types of arthritis share common features of disease, including pain, inflammation, synovial swelling, stiffness in the joints and articular cartilage destruction.* ***Objective:*** *the objective of this study is to analyze pathophysiological progression of rheumatoid arthritis and osteoarthritis.* ***Material & methods:*** *This prospective study was carried out on 50 Arthritis patients from both sexes male and female from different age group. History of the subject and regarding diagnostic parameter were analyzed.* ***Results:*** *Prevalence of arthritis in male and female were proportionally. There were significant changes in most of blood parameters between the different age groups, and there were significant increase in Total Leukocyte Count & Erythrocyte Sedimentation Rate among OA and RA patients. The diagnostic parameter has been directly correlated with progression of disease.* ***Conclusion:*** *In this research, laboratory investigations revealed high levels of inflammatory markers such as ESR, which were present at much higher circulating levels in systemic RA and at much lower levels in OA than in other subtypes; these conventional inflammatory diagnostic parameters can be useful in monitoring Arthritis activity.*

Key Wards: *Arthritis, OA (Osteoarthritis), RA (Rheumatoid arthritis), PLT (Platelet), TLC (Total leukocyte count), ESR (Erythrocyte sedimentation rate), RBS (Random blood sugar), Pathophysiological.*

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I. Introduction

Arthritis normally observed as a disease caused a result of inflamed joints. Inherently it is not just a single disease; it's a collection of medical problems.[1] By nature arthritis is adaptable. Most common forms of arthritis are observed in this study; Osteoarthritis (OA) and Rheumatoid arthritis (RA), where Osteoarthritis (OA) is a progressive disease that can affect all joint structures.[2] OA is not a unique disease, but is a heterogeneous syndrome with different clinical phenotypes that continuously change, eventually leading to common clinical manifestations. The clinical expression of a certain phenotype depends on the main underlying pathway and predominant joint tissue involved at a point in time.[3]

Rheumatoid arthritis (RA) is an inflammatory arthritis that affects nearly 1% of the world's population.[4] It is characterized by symmetric polyarticular inflammation of the synovium, typically of the small joints of the hands wrists and feet. This inflammation results in pain and stiffness, and can lead to progressive joint damage resulting in deformities and loss of function. Associated organ damage also contributes to severe disability.[5] Patients with RA may experience rapid decline in physical activity that can begins early in the disease course.[6] Disability increases most rapidly during the early years of the disease course, and if patients are not diagnosed accurately and do not receive appropriate care early.[7]

On the basis of etiological and molecular biological events of the disease, that primary OA classified into three subsets depending on the main underlying pathophysiological mechanisms: type I (genetically determined) type II (estrogen hormone dependent) and type III (age related)OA. [8] In inflammatory arthritis patients the various risk factors associated. The relationship between Arthritis and other diseases; Osteoarthritis and Diabetes; Osteoarthritis (OA) and Type 2 Diabetes Mellitus (T2DM) are two common chronic diseases in the United States. Osteoarthritis (OA) affects 14% of adults aged 25 and older, and 34% of those over the age of 65.[9] Cardiovascular disease (CVD) burden is more prevalent, best exemplified by higher rates of cardiovascular mortality and morbidity in rheumatoid arthritis (RA) patients.

Haematological abnormalities (including anemia, neutropenia, and Lymphopenia) in RA are common. It is important to collect proper and effective information about the pathological mechanism and modern methods that can maintain the growth and development of arthritis treatment. Inflamed joint issue is increased due to arthritis, to solve this problem pathophysiological treatments are conducted.[10]

II. Material and Methods

The Prospective study was carried out on 50 Arthritis cases, during January 2020 to January 2021, those attended in NIMS&R Hospital, Sobha Nagar, NIMS University, Jaipur (Rajasthan) after taking ethical approval. The history of infection, socio-economic status, medication and physical activity record were taken through viva/Questionnaires individually. For laboratory investigations blood specimen were collected in the concern department and analyzed.

Statistics: The results of subjects are framed in Excel sheet, put into in a table, evaluated with percentage. The data analysis was done by using SPSS.

III. Results

Table no 1: Sex and Age distribution in arthritis patients

Sex Distribution			
	No. Of patients	Percentages	
Male	26	52%	
Female	24	48%	
Age Distribution			
Age group		No. Of patients	Percentages
Group 1	20-40 years	11	22%
Group 2	41-60 years	28	56%
Group 3	61-80 years	11	22%
Total No. OF Patients		**50**	**100%**

Sex and Age: The age distributions of the patients in arthritis are as follow. It varied over a wide range from 20 years to 80 years of age. The majority of patients belong to age group of 41-60 years (56%). In this present study age distribution of the patients in arthritis is 26 males (52%) remaining are females 24 (48%). Ratio of male and female is 1:1.

Table no 2: Physical Activity in arthritis patients

		No. of patients	**Percentage (%)**
Physical activity	Normal Activity	20	40%
	Mild/No Activity	18	36%
	Active	12	24%
Total No. of patients		**50**	**100**

Physical activity: Physical activity was measured by using P. Questionnaire. Out of 50 (100%), 20 (40%) of arthritis patients have normal physical activity, 18 (36%) patients have mild or no physical activity while 12 (24%) patients are physically active.

Table no 3: Hematological and other parameters in arthritis patients

Parameters	**Normal (%)**	**Decrease (%)**	**Increase (%)**	**Total %**
TLC	36 (72%)	0 (0%)	14 (28%)	100 %
ESR	24 (48%)	0 (0%)	26 (52%)	100 %
RBS	45 (90%)	0 (0%)	5 (10%)	100 %

Total leukocyte, Erythrocyte sedimentation rate and Random blood sugar: Association of Total Leukocyte Count (TLC), Erythrocyte Sedimentation Rate (ESR) and Random Blood Sugar (RBS) with disease activity measure in the table 3. Out of 50 Arthritis patients, 72% patients have normal TLC level while 28% have increased. 58% patients have normal Platelet while 42% patients have decrease. 48% patients have normal ESR level while 52 % patients have increased. 90% patients have normal Random Blood sugar level while 10 % have increased sugar level.

IV. Discussion

This present study provides the broadest evaluation to instance of the association between hematological abnormalities at disease onset and risk of common disease among individuals with Arthritis. According to the findings of the current study, 52 percent of cases are male and 48 percent are female. In our study, the majority of cases (56%) are between the ages of 41 and 60, 22 percent are between the ages of 20 and 40, and the remaining 22 percent are between the ages of 61 and 80.F Guillemin et al (2001)[11] reported overall estimate of prevalence standardized for age and sex was 0.31% (95% confidence interval (CI) 0.18 to 0.48). It increased with age up to 75 years and showed a sharp decrease at older age (table 2). The prevalence was 0.51% (95% CI 0.27 to 0.82) for women and 0.09% (95% CI 0.02 to 0.20) for men-a female to male ratio of 5.66. Yong Ping Li et al (2013)[12] stated age-related changes in other tissues besides articular cartilage may also contribute to OA development. In our study, 40% patients have normal physical activity, 36% patients have mild or no physical activity, 24% patients have Active or good physical activity. Rowland W. Chang et al (2014)[13] stated that physical activity (PA) can improve a variety of health outcomes and reduce health care costs. Guy Plasqui et al (2008) [14] stated, effect of exercise on muscle mass or the ability to prevent or reverse cachexia are somewhat contradictory, but it appears that gains in muscle mass can be achieved when the training dose is sufficiently high. Margaret Shih et al (2006)[15] stated that, the significance of physical activity counseling and associated pain management measures provided by healthcare providers should be emphasized.

In present study, 72% patients have normal TLC level while 28 % have increased. Eman Tariq Ali et al (2019)[16] reported The most significant rise in WBC was seen in patients with RA. 48 % patients have normal ESR level while 52 % patients have increased. R.T. Keenana et al (2008)[17] reported, ESR and CRP levels were only moderately correlated, and they were only weakly correlated with measures of disease activity. 90% patients have normal Random Blood sugar level while 10 % have increased sugar level.

V. Conclusion

Arthritis is a serious condition. It causes significant, long-term morbidity due to pain, fatigue, sleep disturbance, depression, and disability, putting a significant strain on people's daily functioning and quality of life. In our study, laboratory investigations revealed high levels of inflammatory markers such as ESR and CRP, which were present at much higher circulating levels in systemic RA and at much lower levels in OA than in other subtypes; these conventional inflammatory parameters can be useful in monitoring Arthritis activity.

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