

Clinical and Immunological Study of Chronic Polyarthritis

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Abstract- Aims and objectives: This study is designed to determine the clinical and immunological aspects of patients with chronic polyarthritis, and assess the different causes of chronic polyarthritis using detailed history of the course of the disease along with clinical examination and immunological tests to support an early recognition of the polyarthritis.

Materials and methods: A study on 50 consecutive cases with polyarthritis of duration more than 6 weeks were studied from a time period between July 2012 to September 2014.

Observation and results: In this study, 34% cases were RA, 30% cases were OA, 8% were SLE, 8% were Psoriatic arthritis, 6% were Reactive arthritis, 6% were gouty arthritis, 4% were Sjogrens syndrome, 4% were Takayasu arteritis and Ankylosing spondylitis each.

Conclusion: In conclusion a major cause of chronic polyarthritis is RA followed by OA, SLE and Psoriatic arthritis. An attempt was made to study chronic polyarthritis based on clinical features, laboratory investigations, immunological tests and radiographic changes. However, further studies based on a larger population are awaited in near future for the overall prevalence of different polyarthritis.

burden with more than 40% individuals showing this clinical picture beyond 50 years age.¹

An array of diseases like rheumatoid arthritis, psoriatic arthritis, systemic lupus erythromatosus, ankylosing spondylitis, Sjogren's syndrome, sarcoidosis, vasculitis, gout, osteoarthritis, hypothyroidism, hyperthyroidism, amyloidosis, acromegaly, multiple myeloma, and metastases can present as chronic polyarthritis. Dr Anne Mies Richie of Southern Illinois School of Medicine states that it is essential for the inflammation of joints to remain for more than 6 weeks to diagnose it as a chronic disease since the management varies according to the duration.²

Inflammatory joint conditions are characterised by chronic inflammation of synovial membranes and other structures in and around the peripheral joints and spine, causing risk for destruction of the involved structures and subsequent functional impairment. Frequently, these disorders are generally referred to as "chronic polyarthritis". Studies suggest that approximately 2% of the adult population suffer from an inflammatory joint disorder.³ The ability to manage activities of daily living (ADL) and the ability to perform in work and recreational activities may be seriously impaired.

I. INTRODUCTION

Polyarthritis is a widespread disease pattern having a share of 4% as musculoskeletal disorder in the national disease

Figure 1: Rheumatoid arthritis: Deformities present: Swan neck deformity, Boutonnere deformity.

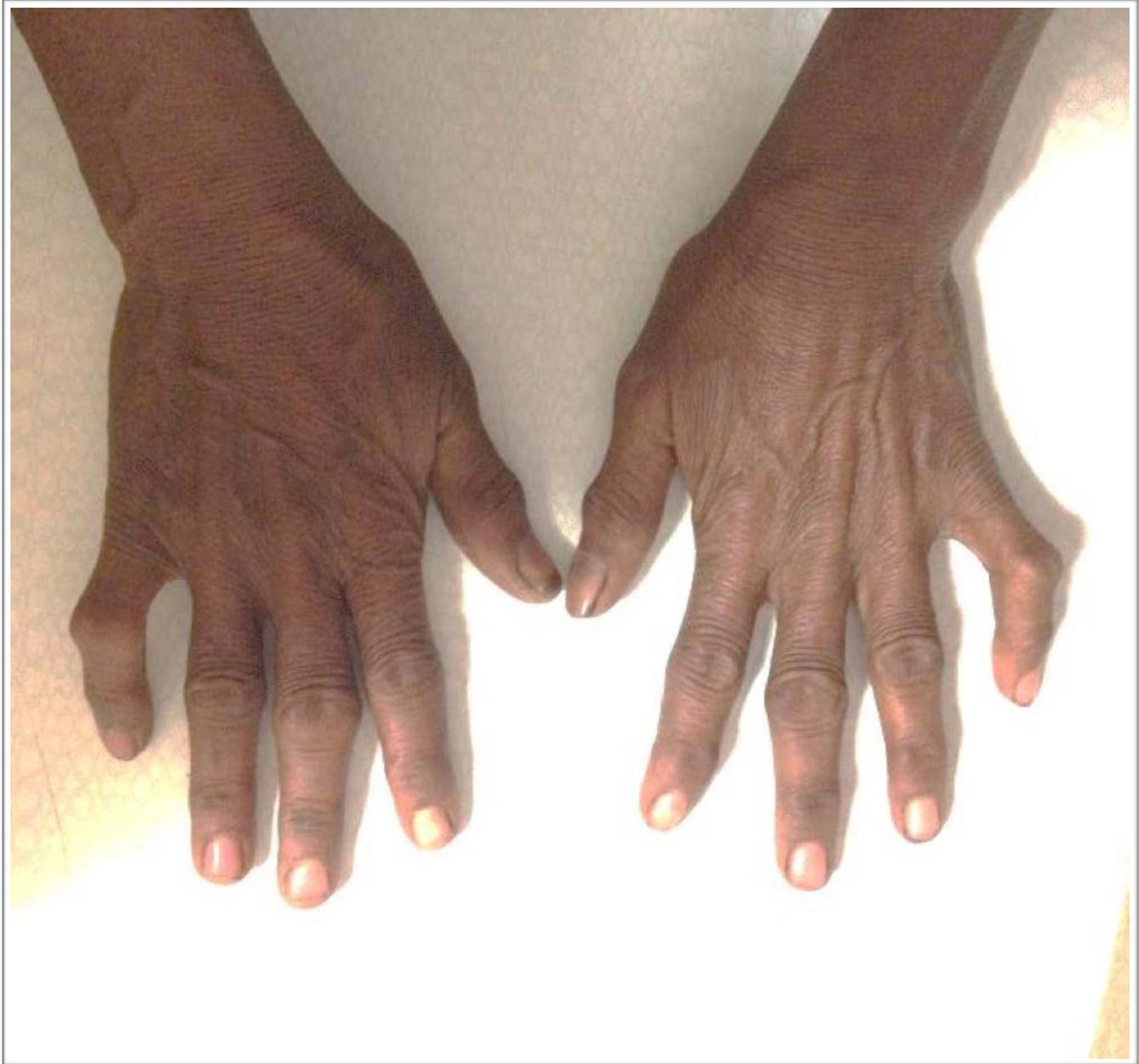


Figure 2: Xray wrist and hand showing erosions, osteopenia suggestive of Rheumatoid arthritis.



Figure 3: Tophaceous deposition in 1st metatarsal suggestive of gout



II. MATERIALS AND METHODS

A study on 50 consecutive cases with polyarthritis of duration more than 6 weeks were studied from a time period between July 2012 to September 2014.

Joint pain was analysed on grounds of symmetry, sequence pattern, severity grade: on a subjective scale of 1 to 10, aggravating factors, relieving factors, course, swelling, stiffness, fatigue, limitation of movement.

Associated features that occurred concurrently with complaints of joint pain were noted like fever, urinary complaints, rash, diarrhoea, eye complaints like congestion, dryness, redness. Associated co-morbidities were noted: DM, hypertension, TB, heart disease, thyroid disease, psoriasis, previous infections.

Joints were examined on basis of appearance, sites, overlying skin, redness, swelling, range of motion, tenderness, temperature, movements, bursal swelling or tenderness, muscles examination for tone and nutrition. Deformities were noted.

Laboratory investigations included: haemoglobin levels: peripheral blood smear, total leucocyte count, platelet count,

ESR, liver function tests, renal function tests, serum proteins, serum calcium, serum phosphorous, serum uric acid, C reactive protein levels.

Immunological studies included : rheumatoid factor, ASO, ANA blot, specific test: anti Ro/La, anti smith, anti ds DNA, anti CCP, ANCA, CPK.

Radiological investigation: all affected joints were subjected to radiography.

III. RESULTS

A total number of 50 cases were studied. There were 14 cases (28%) seen in the age group more than 60 years. 12 cases (24%) were seen in age group of 31 to 40 years. 10 cases each were seen in the age group of 41 to 50 and 51 to 60 (20%). Our study showed 34 females (68%) and 16 males (32%).

Joint pain was described according to symmetry, sequence, severity grade, aggravating factors, relieving factors, course, swelling and stiffness(refer to table 1).

Table 1: Joint pain wise distribution of cases in study group

| Joint pain | | No of cases | Percentage (n=50) |
|---------------------|---------|-------------|-------------------|
| Symmetry | S | 39 | 78 |
| | As | 11 | 22 |
| Sequence | Add | 12 | 24 |
| | Int | 36 | 72 |
| | Mig | 2 | 4 |
| Severity grade | 1 – 3 | 0 | 0 |
| | 4 – 6 | 22 | 44 |
| | 7 – 10 | 28 | 56 |
| Agreevating factors | Const | 25 | 50 |
| | WA | 24 | 48 |
| | WC | 1 | 2 |
| Relieving factors | Rest | 48 | 96 |
| | WM | 2 | 4 |
| Course | Prog | 32 | 64 |
| | Stat | 18 | 36 |
| Swelling | Present | 39 | 78 |
| | Absent | 11 | 22 |
| Stiffness | All day | 8 | 16 |
| | Morning | 17 | 34 |
| | No | 25 | 50 |

The duration of symptoms was reported mostly in less than 3 years as seen in 23 cases (46%) in our study. 13 cases (26%) showed duration of 4 to 6 years while 14 cases (28%) showed duration of more than 6 years.

Fever was commonest associated feature seen in 29 cases (58%) followed by urinary complaints as seen in 21 cases (42%). Dry eye and conjunctivitis was seen in 9 patients (18%) and rash was in 4 cases (8%). 8 cases (16%) showed addiction to smoking, 6 cases (12%) showed addiction for alcohol followed by 3 cases (6%) with tobacco addiction. Tophi was seen in 2 cases (4%), rash in 7 cases (14%) and salivary gland enlargement was seen in 2 cases (4%). Nail changes were seen in 3 cases (6%).

Joint affection was symmetrical in 36 cases (72%). Swelling was evident in 34 cases (68%). Of these 13 cases were RA, 8 cases were osteoarthritis, 3 were Reactive arthritis, 2 were psoriatic arthritis & SLE each, 1 was Sjogren syndrome. Crepitus was seen in 13 cases (26%) and all were osteoarthritis. 28 cases (56%) showed restricted movement of which 16 cases were RA. 21 cases (42%) showed joint deformities.

20 cases (40%) showed positive anti CCP with p value < 0.0001 which is highly significant. C reactive protein levels were positive in 28 cases (56%) and negative in 22 cases (44%) (refer to table 2).

Table 2: Association between Immunological test and diagnosis in study group

| Immunological test | RA | OA | SLE | Others | Chi-square | P Value |
|--------------------|------|------|-----|--------|------------|---------|
| | n=17 | n=15 | n=4 | n=14 | | |
| Rh factor | 9 | 2 | 2 | 2 | 8.65 | <0.05 |
| ANA | 2 | 0 | 4 | 2 | 24.12 | <0.0001 |
| Anti CCP | 16 | 0 | 2 | 2 | 34.77 | <0.0001 |
| ANCA | 0 | 0 | 0 | 1 | 2.62 | >0.05 |
| Others | 0 | 0 | 3 | 3 | 20.58 | <0.0001 |

Radiological changes (refer to table 3).

Table 3: Radiological changes wise distribution of cases in study group

| Radiological changes | No of cases | Percentage (n=50) |
|----------------------|-------------|-------------------|
| Soft tissue swelling | 36 | 72 |
| Erosions | 16 | 32 |
| Osteopenia | 35 | 70 |
| Joint space | 28 | 56 |
| Deformities | 22 | 44 |
| Others | 12 | 24 |

In our study we found the following distribution of cases (refer to table 4).

Table 4: Diagnosis wise distribution of cases in study group

| Diagnosis | No of cases | Percentage |
|-------------|-------------|------------|
| R Arthritis | 17 | 34 |

| | | |
|------------------------|----|-----|
| Osteoarthritis | 15 | 30 |
| SLE | 4 | 8 |
| Psoriatic arthritis | 4 | 8 |
| Reactive arthritis | 3 | 6 |
| Gouty arthritis | 2 | 4 |
| Sjogrens syndrome | 2 | 4 |
| Takayasu disease | 2 | 4 |
| Ankylosing Spondilitis | 1 | 2 |
| Total | 50 | 100 |

There was no significance found in association of type of polyarthritis with serum albumin ,serum calcium, serum phosphorous and uric acid levels.Comparison between peripheral blood smear and type of polyarthritis showed significance.Renal function tests were increased in SLE and was significant.

IV. DISCUSSION

The age at onset of polyarthritis varies widely depending on the disease. For example, 65% of patients with systemic lupus erythematosus (SLE) start manifesting their symptoms between ages 16 and 55 years. Rheumatoid arthritis (RA) peaks between ages 30 and 55^{4,5} and Sjögren’s syndrome (SS) between ages 45 and 50⁶. In our study 14 cases were in age group above 60 yrs, 12 cases in 31 to 40 yrs, 10 cases in each 41 to 50 and 51 to 60 years. Polyarthritis is reported more frequently by females than males. 68% cases in our study were females. Nationally, women aged 15 years and older, account for 60% of arthritis cases⁷. Prevalence rates of rheumatoid arthritis are two to three times greater among females than males. Osteoarthritis is more common in females than in males after the age of 54 years.

Symptoms

Of 8 variables examined in a study carried out by La Montagna et al⁸ symmetric pain was the most potent discriminating feature for rheumatoid arthritis. Psoriatic, reactive and gout are more likely to present with asymmetric involvement.^{9,10}. Our study showed most cases having symmetrical joint involvement as majority of cases were rheumatoid and osteoarthritis.

Inflammatory arthritis is associated with prolonged morning stiffness which is generalised and may last for several hours. The duration of the morning stiffness is a rough guide to the activity of the inflammation.Patients with chronic inflammatory arthritis may have chronic synovial thickening and swelling.¹¹ In our study joint swelling was seen in 39 cases which was significant.

29 cases with polyarthritis had fever as an associated symptom. Low-grade fever is an expected part of having RA.Fever being a

sign of inflammation, is not seen in osteoarthritis and hence is a differentiating factor from RA and Reactive arthritis. Dry eye was seen in 2 cases (4%) of which both were Sjogrens syndrome. Ocular involvement is a major manifestation of Sjogrens syndrome.Tophi were seen in gouty arthritis.Salivary gland enlargement was seen in Sjogrens syndrome.Changes like onycholysis and pitting was seen in psoriatic arthritis.

Joint Examination

Swelling was seen in 34 cases out of 50 which is significant. Joint swelling is more prominent in cases like RA, osteoarthritis, psoriatic arthritis and reactive arthritis¹⁸⁴. Crepitus was present in 13 cases (26%) and were all osteoarthritis cases. Crepitus indicates the presence of irregularities of the articular cartilage, which most commonly are associated with osteoarthritis, injury, or previous inflammation.¹¹

Deformities were apparent in 21 cases (42%) of which 14 cases were RA, 2 were Sjogrens syndrome, 2 cases were SLE, while remaining were gouty arthritis and psoriatic arthritis.Rheumatoid disease affects the synovium lining the joints and sheaths of the tendon.¹²

Laboratory tests

In our study ESR was significantly raised in RA followed by SLE. It may measure general severity of RA better than CRP, even though it is a poorer measure of inflammation.¹³ There was no significance associated in comparison of type of chronic polyarthritis with levels of serum albumin, serum calcium, serum phosphorous and serum uric acid. Serum uric acid was raised in 3 cases of gouty arthritis which is predictable.

C reactive protein levels were raised in 28 cases (56%) in our study.A study carried out by Pearle et al,have demonstrated an association between a marker of systemic inflammation and local synovial inflammation in patients with OA.

Immunological tests:

In our study rheumatoid factor was positive in about 15 cases of which 9 were RA cases and remainder were SLE and Sjogrens.Serum RF is detected in RA and other autoimmune

disorders, such as Sjögren's syndrome (SS) and systemic lupus erythematosus (SLE).

Anti CCP was positive in 20 cases of which 17 were RA and 3 were overlap of RA with Sjogrens syndrome with p value <0.0001 which is significant. Hence Anti CCP is highly diagnostic for RA in early stages. 8 cases positive for ANA of which 4 were SLE, 2 were Sjogrens and 1 was Takayasu arteritis. Further differentiation for antibodies specific for diseases was done. Of these, Anti Ro/La was positive in 2 cases of Sjogrens syndrome, Anti ds DNA was positive for 2 cases of SLE, Anti Smith for 1 case of SLE and HLA B27 was positive for 1 case of ankylosing spondylitis.

Anti-Ro and anti-La antibodies, also known as SS-A and SS-B, respectively, are commonly found in primary Sjögren's syndrome. Anti-double stranded DNA (anti-dsDNA) antibodies are highly associated with SLE. They are a very specific marker for the disease, with some studies quoting nearly 100% (Tomar et al).¹⁴

Radiological changes:

In our study, 36 cases (72%) showed soft tissue swelling. Erosions were seen in 16 cases (32%). Osteopenia was seen in 35 cases (70%) while joint space narrowing was seen in 28 cases (56%).

A degenerative process is suspected when joint space narrowing, osteophyte formation, bone sclerosis, and subchondral cysts are seen in the absence of inflammatory changes. If joint space narrowing involves the knee but symmetrically involves the joint with periarticular osteopenia, then an inflammatory arthritis such as rheumatoid arthritis is suggested.¹⁵

Inflammatory or erosive osteoarthritis can be viewed as a variation of osteoarthritis in that it commonly involves the interphalangeal joints of the hand, and osteophytes are quite obvious.

The radiographic features of gout show erosions that are near a joint but not specifically marginal and they have sclerotic margins that produce a punched-out appearance. Periarticular osteopenia is also absent.

V. CONCLUSION

Chronic Polyarthritis is commonly seen in age group of more than 60 years followed by 31 to 40 years with female preponderance. The order of joint pain is commonly symmetrical with early morning stiffness in majority. Joint swelling was a prominent feature noticed in all cases of chronic polyarthritis.. The most common associated feature noticed was fever, followed by urinary complaints. Deformities were commonly present in RA, followed by Sjogrens syndrome and gouty arthritis.. Rheumatoid factor was positive in few cases and was not a significant indicator of the underlying disease. Anti CCP was present in majority cases of polyarthritis of which all were RA, which is significant indicator of underlying disease. The most common radiological changes were soft tissue swelling followed by osteopenia and joint space narrowing. Osteoarthritis was the commonest type diagnosed early with radiographs.

Diagnosis wise distribution of chronic polyarthritis was found to have majority of RA cases followed by osteoarthritis, SLE, Psoriatic arthritis, Reactive arthritis, Gouty arthritis, Sjogrens syndrome, Ankylosing spondylitis and Takayasu arteritis. An attempt was made to study chronic polyarthritis based on clinical features, laboratory investigations, immunological tests and radiographic changes. However, further studies based on a larger population are awaited in near future.

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