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PSORIATIC ARTHRITIS: A SYSTEMATIZED REVIEW

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ABSTRACT

Psoriatic arthritis is a chronic inflammatory arthritis which affects about 5-25 percent of psoriasis patients. It can cause permanent joint damage and disability. Several studies have looked at the prevalence of PsA in countries worldwide. In the United States, the prevalence levels vary from 0.06 to 0.25 per cent. Estimates of prevalence in Europe range from 0.05 per cent in Turkey7 to 0.21 per cent in Sweden. There are only a few records of prevalence of PsA in South America and Asia, indicating a lower prevalence in those regions (0.07 per cent in Buenos Aires and 0.02 per cent in China). Psoriatic arthritis is easily diagnosed in typical skin lesions can, however, often occur in the absence of skin lesions using Psoriatic Arthritis Criteria Classification. Screening of psoriasis patients using a questionnaire can aid in early diagnosis. It has also been found that patients with PsA have very heterogeneous courses of disease. Nail dystrophy, lesions of the scalp and intergluteal / perianal psoriasis are associated with a greater chance of psoriatic arthritis developing. In general with the introduction of new medications, early diagnosis can lead to early care and a better outcome. In this review, current knowledge is discussed about risk factors of Psoriatic Arthritis, Laboratory findings for Psoriatic Arthritis, Demographic Features of PsA, screening & major clinical characteristics of Psoriatic Arthritis.

Keywords: Psoriatic arthropathy, Demographic Features, Psoriasis arthritica, Risk Factors, Epidemiology, Screening tools

INTRODUCTION

Psoriatic arthritis is a long-term inflammatory arthritis which occurs in people affected by the psoriasis of autoimmune disease [**1, 2**]. It can cause permanent joint damage and disability. However it is not known that Psoriatic Arthritis is a systemic inflammatory disease with health effects beyond joint function Ex. Cardiovascular disease &similar outcomes to rheumatoid arthritis including the pervasiveness of erosion & joint destruction [**3, 4**]. Several studies have looked at the prevalence of PsA in countries worldwide. Several studies have looked at the prevalence of PsA in countries worldwide. In the United States, the prevalence levels vary from 0.06 to 0.25 per cent [**5-7**]. Estimates of prevalence in Europe range from 0.05 per cent in Turkey 7 to 0.21 per cent in Sweden [**8-11**]. There are only a few records of prevalence of PsA in South America and Asia, indicating a lower prevalence in those regions (0.07 per cent in Buenos Aires and 0.02 per cent in China) **[12, 13]**. The low prevalence of PsA in China may be due to underdiagnosis according to the study of Yang & his colleagues [**14**].

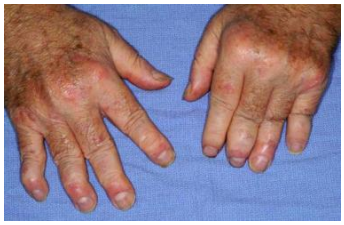

Figure 1: Hands affected from Psoriatic Arthritis [15]

Historical Background of Psoriatic arthritis

Initiating and establishing the idea of psoriatic arthritis should be given credit to the French. Jean Louis Alibert' is widely known to be the first person to document the association between psoriasis and arthritis [**16**]. Pierre Bazin originally coined the term psoriasis arthritique in 1860 [**17**]. However, credit should be given to Bourdillon who was the first to look at the condition in depth.Arthritis-related psoriasis has been classified in the past under a number of names, including rheumatisme psoriasique, psoriasis arthropathique, psoriasis arthritique, polyarthritis psoriasique, arthropatia psoriatica, arthropathia psoriatica, psoriasis arthropathica, arthritis psoriatica, polyarthritis psoriatica, artrite psoriasica, psoriatische arthropathie. Currently psoriatic arthritis and psoriatic arthropathy are widely used terms [**18**]. Two opposing definitions of PsA developed: one held that the condition was a special arthropathy associated with psoriasis [**19**] and the other considered that arthritis was a combination of rheumatoid arthritis and psoriasis [**20**].

Risk Factors for Psoriatic Arthritis

A handful of studies have explored risk factors for PsA among psoriasis patients. Many of the reported risk factors were not

replicated in additional studies except for obesity, PsA family history and injury or trauma [**21]**. Smoking is widely recognized as a risk factor for psoriasis [**22]**. However, smoking findings as a risk factor for PsA are mixed with one that indicates an adverse correlation and one that indicates a positive association [**23]**. The typical risk factors for obesity, diabetes mellitus, hypertension, dyslipidemia and smoking include cardiovascular risk factors observed with elevated frequency in patients with psoriasis. Oxidant pain, endothelial cell dysfunction, irregular platelet adhesion and hyperhomocysteinemia, which can also increase cardiovascular risk. All of them may be considered risk factors common to psoriasis and PsA and may occur more frequently in psoriasis [**24]**.

Diabetes Mellitus in Psoriasis-Lynch had reported an association between psoriasis and hyperglycemia as early as 1967. Numerous studies have since reported the relationship between psoriasis, hyperglycemia and relative resistance to insulin [**25]**. Patients with psoriasis also exhibit hyperinsulinemia and insulin resistance, with a significant association between seriousness of the disease and insulin secretion. Increased insulin levels can lead to excessive levels of insulin-like growth factors (IGFs), which appear to play a role in epidermal hyperproliferation in psoriasis [**26-28]**. The activation of interleukin 6 and the endothelial vascular growth factor was postulated as underpinning the function of IGF in the formation of psoriatic plaques [**29, 30]**.

Conventional Risk factors for Psoriatic Arthritis:

PsA has increased the prevalence of cardiovascular risk factors in 2004, Peters et al reviewed the literature on spondyloarthropathy cardiovascular risk factors, including PsA. In a cross-sectional comparative analysis of PsA patients reported from a US database, Han, et al found that PsA patients had a higher prevalence ratio for type II diabetes, hyperlipidemia and hypertension relative to controls [**31]**. Kimhi, *et al* compared 47 PsA patients to 100 safe controls and found hypertension and hyperlipidemia substa-ntially higher than controls. One hundred and two patients with PsA were screened for cardiovascular risk factors compared to 82 patients with control. Patients suffered from higher prevalence of diabetes mellitus and hypertension and decreased prevalence of lower HDL cholesterol after BMI change. Jones *et al* confirmed this atherogenic lipid profile in 50 PsA patients [**32]**. In the 2 case-control studies Kimhi, *et al* and Tam, *et al* [**33]** have reported elevated BMI in patients with PsA. The full spectrum of metabolic syndrome in patients

with PsA has not been formally studied. Individual metabolic syndrome components including obesity, hypertension, insulin resistance, and dyslipidemia were reported [**34**].

Non Conventional Risks Factors for Psoriatic Arthritis

Inflammation- Chronic inflammation has proven to play a role in atherosclerosis growth. An picture of atherosclerosis as an autoimmune-like inflammatory disorder is emerging. Atherogenesis tends to include both the innate immune system and the T-helper-1 lymphocytes. This is analogous to the history of immune-mediated psoriasis and PsA inflammation. Psoriasis and PsA can produce chronic, systemic inflammation, with higher levels of inflammatory cells and cytokines causing inflammation and plaque formation [**35]**.

Obesity- The increased prevalence of obesity seen in psoriasis and PsA patients can also increase the burden of inflammation. White adipose tissue accumulates in deposits near the blood vessels, where it secretes cytokines, chemokines and hormone-like proteins [**36]**.

Fibrinogen- The other essential acute-phase protein believed to be associated with vascular events is fibrinogen. For psoriasis and PsA the levels of fibrinogen are known to increase.All these elevated markers suggest systemic inflammation in psoriasis and PsA [**37]**, and a potential role in increasing the cardiovascular risk of a patient.

Increases alcohol intake- While moderate alcohol consumption has been shown in several epidemiological studies to be cardioprotective, excessive alcohol consumption increases cardiovascular risk and mortality. In a retrospective review Poikolainen *et al*., found alcohol to be the leading cause of excess mortality in patients hospitalized for psoriasis treatment. In patients with psoriasis excessive alcohol consumption is widely documented. In a population of patients with alcoholic liver disease here showed a higher prevalence and incidence of psoriasis. There is also a suggestion that alcohol consumption in patients who continue to consume excess alcohol may adversely affect treatment outcomes [**38]**.

Homocysteine- In case-control analysis, psoriasis patients had a relative risk 7.1 times greater than tests for substantially elevated homocysteine levels [**39]**. A recent controlled study has shown that psoriasis patients have increased homocysteine levels and lower plasma folate levels compared to normal controls [**40]** this is supported by 2 other uncontrolled studies, one of them in patients taking methotrexate [**41]**.

How Psoriatic Arthritis is Distinguished from Rheumatoid Arthritis

PsA is associated with both bone loss and new bone formation (i.e., proliferation of the juxta-articular bony). Erosions are normal and sometimes quite early on in the course of the disease. Kane and colleagues found the incidence of erosions to be 27% within the first 5 months of the onset of the disease and almost 50% within 2 years of the onset of the disease [**42]**. The number of erosions in PsA was correlated with the duration of the disease and the count of osteophytes was correlated with age but not the duration of the disease [**43]**. One of the most common radiographic characteristics of PsA (such as tuft osteolysis and interphalangeal bony ankylosis) is juxta articular proliferation (not including osteophytes) [**44, 45]**. However, DIP erosions, new periosteal bone formation and diffuse swelling of soft tissue can help distinguish RA from PsA. MRI and ultrasound studies examined differences among RA and PsA patients [**46]**.

Laboratory Findings for Psoriatic Arthritis

A persistently negative test for rheumatoid factor is the most distinctive and widely accepted characteristic of the laboratory investigations in psoriatic arthritis. Hyperuricemia can be observed in l0 per cent-20 per cent of patients [**47]**. "Eisen and Seegmiller have shown that hyperuricemia represents increased purine metabolism in the skin, and psoriatic serial biopsies of impaired and clinically stable skin have shown increased DNA synthesis [**48]**. However, it should be noted that mild psoriasis is not usually accompanied by an elevated level of serum uric acid; thus, unless the rash is severe, hyperuricemia usually indicates gout in a patient who is considered to have psoriatic arthritis. Certain miscellaneous and frequently contradictory biochemical results include normal; erythrocyte phosphoglucose-isomerase activity [**49]**; absence of antinuclear factor [**50]** elevated gamma and alpha-2-globulins; [**51]** "decreased levels of IgM in moderate psoriatic arthritis and elevated levels in extreme psoriatic arthritis [**52]**".

Psoriatic Arthritis is a Heterogenous Disease

PsA describes a clinically heterogeneous condition. Moll and Wright initially identified five subtypes of psoriatic arthritis: monoarthritis or oligoarthritis, polyarthritis, distal interphalangeal (DIP) joint predominant psoriatic spondylitis or sacroiliitis, and arthritis mutilans [**53]**. It is now known that patients can have any combination of the features of the condition: peripheral arthritis (monoarticular, oligoarticular, or

polyarticular with or without involvement in DIP), enthesitis, dactylitis, spondylitis or sacroiliitis, as well as psoriatic nail condition [**54]**. Peripheral arthritis (the most common type of the condition, either oligoarticular or polyarticular depending on the cohort examined).Arthritis mutilans is thought to be very rare overall, but one of the original 5 subtypes of PsA described by Moll & Wright. However, it is difficult to establish the prevalence of arthritis mutilans despite the varying meanings [**55]**. Variation is due in particular to widely varying meanings of subtypes **Figure 2** Variability of the characteristics of the disease per analysis. A handful of studies indicate prevalence of oligoarthritis, polyarthritis, axial disease, dactylitis, and nail disease. Such PsA manifestations, the meanings of the manifestations and the included populations differ considerably by research. Gladman, Lindqvist, and Love, for example, present data at first visit for patients, while Wilson and Reich report data at diagnosis of injuries. Lindqvist represents a population of early-illness patients (< 2 years). In fact, research describes axial disease quite differently. Lindqvist used the original subgroups of Moll and Wright to work out patients. Therefore axial disease as described here in this specific study only applies to patients without peripheral arthritis (those patients are known as oligoarthritis or polyarthritis). In Love and colleagues, patients with chronic back pain are represented by axial disorder [**55]**.

(e.g. allowing for more than one occurrence or exclusive classification) but may also represent specific subtypes in various populations, period of PsA in the population studied, period of psoriasis before the emergence of PsA, or distribution of age and gender in the population [**56, 57]**. Recognizing the characteristics of the disease at the onset and when choosing treatments can be critical for recognizing the results of the disease and treatment. Polyarticular disease, for example, has been associated with more erosive disease, and dactylitis does not even react to typical oral disease-modifying antirheumatic drugs (DMARDs) [**58-60]**.

Demographic Features of PsA

Psoriatic arthritis typically occurs in the fourth and fifth decades, but with cases occurring in small children and elderly people no age is excluded. Both genders are similarly affected with research showing a ratio of 0.7:1 to 2.1:1 between male and female. Arthritis accompanies chronic psoriasis of around 7–12 years in more than half of patients (49–75 percent).It is accompanied by simultaneous onset of skin

and joint disease in 10–37% of patients and lastly, psoriasis will precede 6–18%.

Psoriasis vulgaris is the most common type of psoriasis related to psoriatic arthritis. Approximately 5 percent of cases of psoriatic arthritis contribute to guttate and pustular psoriasis. In 1–2 percent of cases single nail involvement without skin involvement.

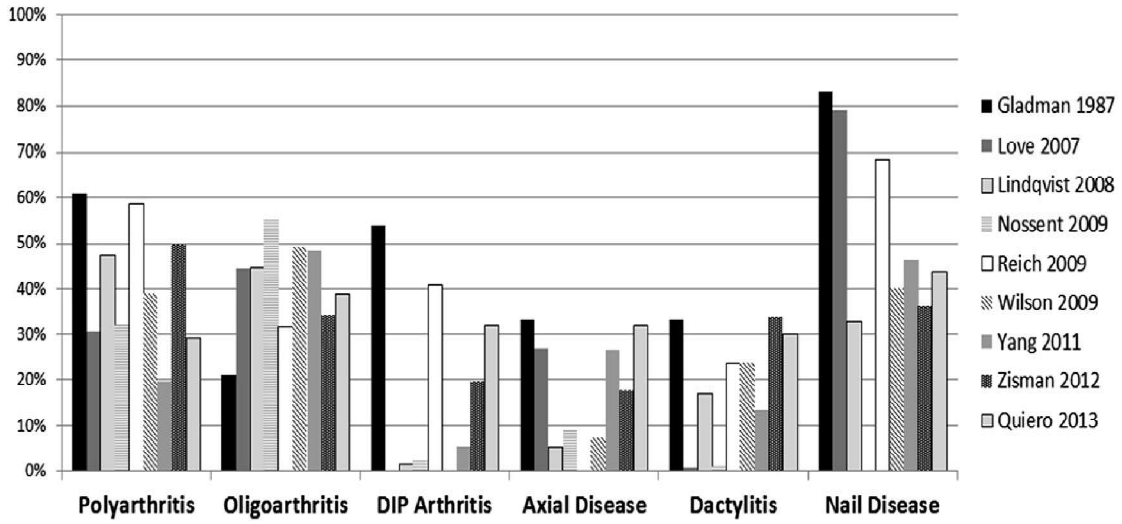

Figure 2: Variability of the characteristics of the disease per analysis

Table 1: Demographic features of Psoriatic Arthritis [61]

(years)		Duration after Psoriasis(years)	After Psoriasis(%)	Simultaneous(%)	Before(%)	Psoriasis type(%)
37	0.9:1	12.8	68	15	17	V94,G4
37.6	0.8:1	8.7	63	19	18	V89G4P3
40.9	2.1:1	NA	50.8	37.1	12.1	V81G1E3P4
39.7	1.2:1	8	72.7	12.3	14.9	V94G1E3P2
48.7	0.8:1	9	59.5	30	9.9	NA
NA	1.1:1	NA	NA	NA	NA	V94P6
39		7	49	35	6	NA
34	1.4:1	8	NA	NA	13.8	NA

NOTE: V= Vulgaris; G= Gutate; E= Erythrodermic; P= Pustular; NA= Not available

Screening of Psoriatic Arthritis

PsA screening can be as easy as asking about the existence of arthralgia or conducting using approved screening tools. Some organizations have developed questionnaires to help classify PsA patients with psoriasis. Such questionnaires each have a cut-off value that indicates a high likelihood of developing inflammatory arthritis, causing subsequent assessment of the rheumatology. Screening methods should typically be highly sensitive but, despite the difficulties of obtaining rheumatology in many countries, screening

for PsA should preferably also be highly precise.

Major Clinical characteristics:-

1) **Spondylitis (Axial Disease)** Inflammatory backache in patients 18–46 per cent. Inflammatory pain in the neck was reported in 23–39 percent and considered it to be in some sequence more common than backaches. The CASPAR study found 17 per cent thoracic inflammatory pain [**62**]. On survival just 25–50 per cent of patients now have follow-up the axial signs are asymptomatic by 5–10 years, the remainder. For those patients with no axial signs, too just 10–25 per cent of patients initially experience these over the next ten years. Spinal movement is beyond axial signs maintained in most patients without decrease in Spinal flexion or Chest expansion over the next decade. However, one study found an increase in weakness of the cervical spine. Axial involvement may also be clinically silent, and only about half of patients with radiological spinal involvement can experience symptoms [**63**].

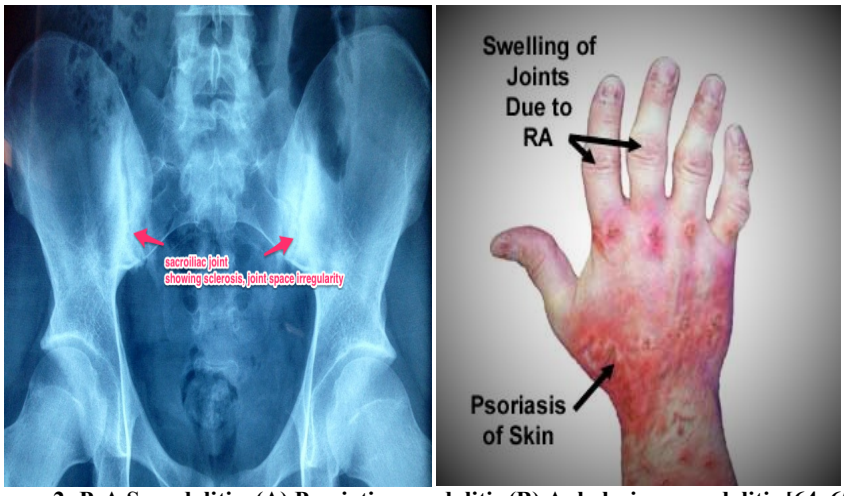

Figure 2: PsA Spondylitis: (A) Psoriatic spondylitis (B) Ankylosing spondylitis [64, 65]

Among 11–37 percent of patients, radiological sacroiliitis is present. A research in Italy found prevalence of32% Detecting persistent sacroiliitis using bone scan [**66**]. However, a multicenter study from the US observed sacroiliitis in 78 percent of patients on 202 patients with a disease period of 12 years [**67**]. The high numbers in this analysis may be due to the long duration of the disease. Indeed, one study showed that among patients with no x-ray sacroiliitis A third established it at baseline at 5 years and a half at 10 years. Likewise, almost half of those with lower grades went on to higher grades over 10 years [**68**]. Furthermore, males were found to have a three-times higher prevalence of sacroiliitis than females. The sacroiliitis is

more likely to be unilateral compared to ankylosing spondylitis, which may become bilateral in later disease.

Peripheral arthritis - It can vary from polyarthritis to monoarthritis. In early disease, asymmetric oligoarthritis that often includes knee or a large joint .This is most commonly used along with a few small joints in the finger or toes. Oligoarthritis can contribute to dactylitis. Typical of psoriatic arthritis is the single DIP joint involvement associated with nail involvement; but it is uncommon. Like with other joints, DIP joint is also involved Polyarthritis includes normally small joints of hands and feet, and even rheumatoid arthritis can be replicated **[69]**. Nearly 40 percent of patients with a subtype of polyarthritis have dactylitis and enthesitis and this can help to differentiate psoriatic arthritis from rheumatoid arthritis.

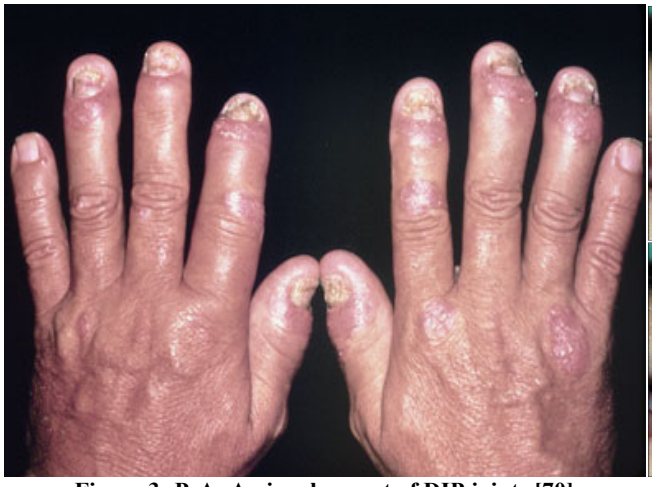

Figure 3: PsA: An involvement of DIP joints [70]

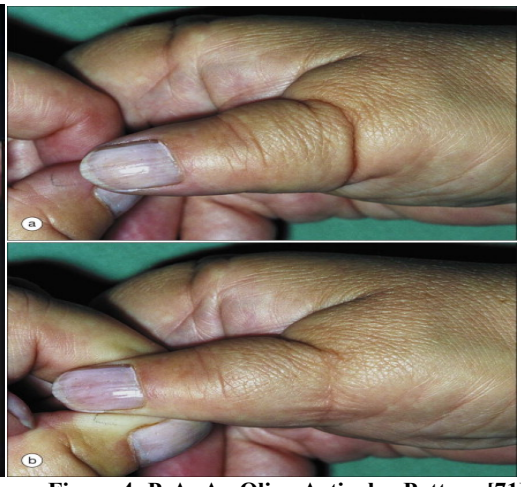

Figure 4: PsA: An Oligo Articular Pattern [71]

CONCLUSION

PsA is a chronic inflammatory arthritis with potentially significant functional weakness and negative consequences, including cardiovascular illnesses. It's necessary to detect PsA early for the betterment of long-term results. Use of screening methods and enhanced risk factor awareness may boost early detection.

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