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COLLEGE OF HEALTH SCIENCES

DEPARTMENT OF DERMATOVENEREOLOGY

Magnitude and Pattern of psoriatic arthritis using PEST Questionnaire among patient with psoriasis attending at ALERT Hospital, Dermatology OPD Addis Ababa 2023: prospective single centered cross sectional study

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Advisor's approval sheet

This is to verify the thesis entitled "Magnitude and pattern of psoriatic arthritis using PEST among patients with Psoriasis attended at ALERT Hospital , dermatology OPD ,Addis Ababa 2023 : Prospective Cross-Sectional Study" is submitted in partial fulfillment of the requirements for the Specialty Certificate in Dermatovenerology to the graduate program of the school of Medicine in Addis Ababa University and has been carried out by Dr Ababiya Tafesse under our supervision.

The student has fulfilled the thesis requirements and hence here by can submit the thesis to the school.

Name of advisor: ……. Date…… Signature……..

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Name of advisor: ……. Date…… Signature……..

Examiners' Approval Sheet

We, the undersigned, members of the Board of Examiners of the final open defence by Dr Ababiya Tafesse , have read and evaluate his thesis entitled "The Magnitude and pattern of psoriatic arthritis using PEST among psoriatic patients attended at ALERT Hospital , Dermatology OPD ,Addis Ababa 2023 : Prospective Cross Sectional Study". This is to verify that the thesis has been accepted in partial fulfillment of the requirements for the Specialty Certificate in Dermatovenereology to the graduate program of the school of Medicine in Addis Ababa University

Name of internal examiner: ……Date…… Signature……..

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Content

Acknowledgement

I am very grateful for having this opportunity to do this research for partial fulfillment of residency program. As result I would like to acknowledge Addis Ababa University College of health science and department of Dermatology & venereology for offering this chance and also for my advisors for giving their time and knowledge for better research outcome and quality**.**

Acronym

PsA psoriatic arthritis

PEST psoriatic epidemiologic screening tool

PsO psoriasis

CASPAR classification of psoriatic arthritis

EARP Early psoriatic arthritis screening questioner

IRB Institutional review board

Abstract

Background: Psoriatic arthritis is the most common extra-cutaneous manifestation of psoriasis, and affects musculoskeletal structures mainly joints and entheses, where tendons and ligaments attach to the bone. It is a chronic immune-mediated, seronegative arthritis with a heterogeneous presentation. Its prevalence ranges from 3.2 to 41% among psoriatic patients with equal sex prevalence. Most of the PsA patients were first evaluated for skin psoriasis 10 years before PsA onset and PsA is often undiagnosed and unrecognized among patients followed at dermatology clinics. So, we have to equip dermatologists with tools that can easily assist in identifying PsA.

The psoriasis epidemiologic screening tool (PEST) is a validated screening tool for psoriatic arthritis (PsA) that was developed to detect and study the prevalence of PsA. Since it has only five questions, it is easy to use in routine OPD setup.

Objective: To determine the magnitude of PsA among PsO patients at ALERT Hospital

Methods: Cross-sectional study single centered hospital-based prospective study design.

Result: There were 65 patients with psoriasis involved in the study with a 99.9% response rate, among those involved in this study, there were 44(67.7%) male and 21(32.3%) female participants, with a mean age of 40.3-year with a standard deviation of 14.88 years.

We have 13.9 % of patients with PsA, among these 5(55.5%%) were male and 4(44.444%) were female with p(0.455).

The pattern of PsA in our patient according to Moll's classification were (44.4%) 4, (22%) 3,(33.3%%) , (22%) 2, and 0% for oligoarthritis, polyarthritis, predominantly hand joint, spondyloarthritis and arthritis mutilans respectively and 66% had psoriasis skin manifestation precedes joint symptoms of PsA and 33% had concurrent onset between psoriasis skin manifestation and PsA.

Conclusion: We found out that 13.8% were patients with PsA among total psoriasis participants which indicates it is not rare despite the limitation of the study..Also the underdiagnosed rate in our study also 13.8% since all patients were not classified as PsA before.

Not all patients with psoriasis having joint symptoms are PsA patients.

The commonest pattern of PsA found to be oligoarthritis

1. Introduction

1.1 Background

Psoriasis is a chronic, immune-mediated systemic inflammatory disorder that has polygenic and multifactorial etiology. Although psoriasis is a systemic disease, it commonly and initially presents as well-demarcated, erythematous plaque, thick silvery scale and Auspitz sign. it may have different skin presentation, according to morphology or natural history, based on age or precipitants and specific site, which may determine the severity and extracutaneous complications.

Psoriatic arthritis is the most common extra-cutaneous manifestation of psoriasis, which affects musculoskeletal structure mainly joints and enthuses, where tendons and ligaments attach to the bone. It is a chronic immune-mediated, seronegative arthritis with heterogeneous presentation.

Its prevalence ranges from 3.2 to 41% among psoriatic patients with equal sex prevalence.[1] Although male has more axial disease than peripheral psA[2]. The majority develop PsA before 40 years of age. Childhood onset is rare[2]. The majority of PsA have a history of prior psoriasis around 20% of PsA might precede skin manifestation and also 10% of cases might present concurrently. PsA has an association with scalp, intergluteal or perianal, nail, severe psoriasis, and uveitis and also it has cardiovascular and inflammatory bowel disease association.[1]. some individual and environmental factors increase the risk for PsA like smoking, alcohol, obesity, HLA 27 metabolic syndrome and HIV.[1]

Can affect six clinical domains like peripheral and axial PsA, dactylitis, enthesitis, psoriasis and nail psoriasis.[3] According to Moll and Wright's classification, we have 5 clinical patterns of joint involvement[1]. These are oligoarticular, polyarticular, DIP, spondyloarthritis and arthritis mutilans accounting for 70%,15%,5%,5%, and 5% respectively.

Table 1. CASPER Criteria

Classification criteria	**point**
1 psoriasis **a) Current** **b) Personal history** **c) Family history**	 **2** **1** **1**
2 current psoriatic nail dystrophy	**1**
3 Negative RF	**1**
4 dactilitis(current or previous documented by rheumatologist)	**1**
5 Juxtaarthicular new bon formation on plain radiograph	**1**
A classification of psA met if the patient fillfull 3 or more point.specificity 98.7and sensitivity 91%	

.

PEST is a modified version of PsA questionnaire that is developed to detect and study the prevalence of PsA.it has five questions. These are Have you ever had swollen joints or joints, Has your doctor ever told you that you have arthritis, Do your fingernail or toe nail have a pit or hole, Have you had pain on your heel, and Have you had finger or toe that was swollen for no apparent reason.

This screening tool can miss up to 30% of PsA.[1] But if it combines with a high index of suspicion, we can detect early musculoskeletal manifestations before frank joint involvement like joint morning stiffness, fatigue, and joint pain[1]

Regarding the PEST individual questions try to asses components or domains of psoriatic arthritis like peripheral and axial joint involvement, enthesitis, dactylitis, nail and psoriasis. For example the first question asses peripheral and axial joint involvement and 4th and 5th question asses enthesitis and dactylitis respectively

1.2 Statement of the problem:

PsA is often undiagnosed and unrecognized among patients followed at dermatologic clinics. This rate reaches up to 30% in some studies.[2]If it does not peak within 6 months of clinical onset, the morbidity associated with it will be high and the chance of disease control by medication will be minimal and difficult. To overcome this issue different validated screening tools have been developed that are easily integrated into routine history and physical examination of patients by doing so the dermatologist can easily peak PsA and the disability associated with it.

1.3 Significance of study:

In our hospital and country as a whole we don't have study about the magnitude of PsA. So, our study may address this issue and become the baseline for another study. Most importantly, it helped dermatologists and residents to include this questionnaire in their daily practice and identify early signs of PsA and subsequent disability.

2. Literature review

In Africa the prevalence study on PsA are limited and few of them are hospital based. Among these study, we can conclude that the prevalence of the PsA are uncommon in Africa especially pre HIV AIDS era. This is

because he genetic marker of PsA HLA B 27 not common in African and unidentified protective genetic and environmental factors.

One review done on prevalence of PsA on sub Saharan Africa found [6]

Table 2. Prevalence of Psoriatic arthritis in Africa

Country	Reference	period	population	number	PsA %	PsA/hiv%
Uganda	**24**	1980	Rheumaology		7	**0**
Ivory coast	25	1983-88	Rheumaology and Derma	8233	0.13	40
Congo	26	1989-90	Rheumaology and Derma	3480	0	0
Zambia	27	1994-97	Rheumaology	702	4	96
Burkina faso	28	2008	Hiv + on ART therapy	336	0	-

"A cross-sectional hospital-based study reported two cases of PsA among 42 patients with psoriasis (5%) attending specialized skin clinics in Tanzania "[29]

" The prevalence of PsA in the general population of subSaharan Africa is unknown, but it has been reported sporadically in isolated studies . Hospital-based studies have reported the prevalence of PsA to be 1% (95% CI −0.10 to 2.10) in patients with HIV in urban Uganda (n=300), 0.01% (95% CI −0.01 to 0.02) among 12,494 outpatients in a rheumatology clinic in urban Cameroon , and 0.1% (one occurrence) of 984 patients attending two rheumatology practices in the Democratic Republic of Congo." [8]

" Psoriatic arthritis among Egyptian patients with psoriasis attending the dermatology clinic a cross-sectional observational study was performed. Screening questionnaires - the Psoriasis Epidemiology Screening Tool

(PEST) and Early Arthritis for Psoriatic Patients (EARP) - were applied to 200 psoriasis patients; among them *n* = 22 (11% of all tested patients) were in developmental age. The prevalence of PsA was found to be 30%, with a mean age of 45.48 ±10.79 years. Further, psoriasis preceded the onset of PsA in 46 patients (76.6%), arthritis began before psoriasis in 6 individuals (10%), and both psoriasis and arthritis coincided in 8 (13.3%) patients. Obesity (OR 7.0, 95% CI: 2.61-18.85), nail psoriasis (OR 5.02, 95% CI: 2.02-12.476), and intergluteal cleft site (OR 12.659, 95% CI: 4.302-37.255) were associated with increased risk of PsA. However, classic plaque psoriasis (OR 0.149, 95% CI: 0.051-0.433) and flexure site (OR 0.238, 95% CI: 0.076-0.746) were linked with a decreased risk of PsA development." [9]

"A cross-sectional population-based study of 3985 patients attending primary healthcare clinics in the United Arab Emirates estimated the prevalence of PsA to be 0.3% , while an Iranian single-center cross-sectional study of 320 patients with psoriasis reported that 9.1% had PsA.[8]

During a 2-year clinical follow-up of patients with psoriasis from two tertiary medical centers in Saudi Arabia, the annual incidence of PsA was reported to be 4.3% (n=104)"[8]

"Prevalence of psoriatic arthritis in patients with psoriasis: A systematic review and meta analysis of observational and clinical studies. A total of 266 studies examining 976,408 patients with psoriasis were included. Overall, the pooled proportion (95% confidence interval [CI]) of PsA among patients with psoriasis was 19.7% (95% CI,)[8] The PsA prevalence was 22.7% (95% CI, 20.6%-25.0%) in European patients with psoriasis, 21.5% (95% CI, 15.4%-28.2%) in South American patients with psoriasis, 19.5% (95% CI, 17.1%-22.1%) in North American patients with psoriasis, 15.5% (95% CI, 0.009%-51.5%) in African patients with psoriasis, and 14.0% (95% CI, 95% CI, 11.7%-16.3%) in Asian patients with psoriasis".[21]

"One Northern America/ European study done patient on 34 dermatologic center and sample size of 949 out of this 30% have PsA and 41% newly diagnosed by rheumatologist The prevalence of PsA observed in each of the

7 participating countries is: Canada, 54/299 (18%); United States, 35/98 (36%); Belgium, 6/33 (18%); Denmark, 49/117 (42%); France, 12/44 (27%); Germany, 65/189 (34%); and Hungary, 64/169 (38%)"..[5]

"One cross sectional study on the prevalence of PsA on psoriatic patient done UK by CASPER among 22500 patient and 633 randomly selected with 27% response rate prevalence of PsA is 13.8 with 95%CI". [7]

"Prevalence and Clinical Characteristics of Psoriatic Arthritis in Japan. A multicenter, noninterventional, retrospective cross-sectional study was conducted at 3 tertiary care centers in Japan. PsA was identified in 431 of 3021 patients with psoriasis, with a mean prevalence of 14.3% (range, 8.8–20.4%)".[22]

" One retrospective study on Epidemiological analysis of psoriatic arthritis patients in Japan total, 1282 patients with PsA were identified from the returned questionnaires (92/130 centers, 70.8% response rate), among whom 17.3% were newly diagnosed in 2014. The mean onset age of psoriasis was 36.4 years, whereas that of arthritis was 45.1 years. Psoriasis occurred prior to the onset of arthritis in 76.2% of the patients, after the onset of arthritis in 5.1%. Regarding the types of psoriasis, vulgaris (plaque type) was the major form (88%), followed by erythrodermic (4.5%), pustular type (6.4%) and unknown (1.1% polyarthritis was the most common type (36%), followed by distal interphalangeal (DIP) type (26%), oligoarthritis type (22%), spondylitis type (8.1%) and mutilans type (1.8%) (6.1% unknown)" [23]

" Clinical features of psoriatic arthritis in Korean patients with psoriasis: a cross sectional observational study of 196 patients with psoriasis using psoriatic arthritis screening questioner. The result shows prevalence of 11.2% with 95%CI." [12]

" Comparison of the Four Validated Psoriatic Arthritis Screening Tools in Diagnosing Psoriatic Arthritis in Patients with Psoriasis [COMPAQ Study] out of 302 patient with PSo 14.5% had PSA by CASPAR. The sensitivities and specificities of EARP, PASE, PASE PEST, and ToPAS II were 91.1%, 80%, 75.6%, 53.3%, 44.4% and 87.9%, 94.6%, 94.9%, 95.3% 97.3% respectively."[13]

" One study evaluating Persian vesion of PsA screening tool involving EARP and PEST in Iranian PsA patient : A total of 75 patients (33 [44%] female, 42 [56%] male, with a mean age of 43.2 ± 14.6) were enrolled in the study found out that The sensitivity of EARP and PEST questionnaires was 94.7% and 58%, respectively, while the specificity was 78.6% and 96.4%".[14]

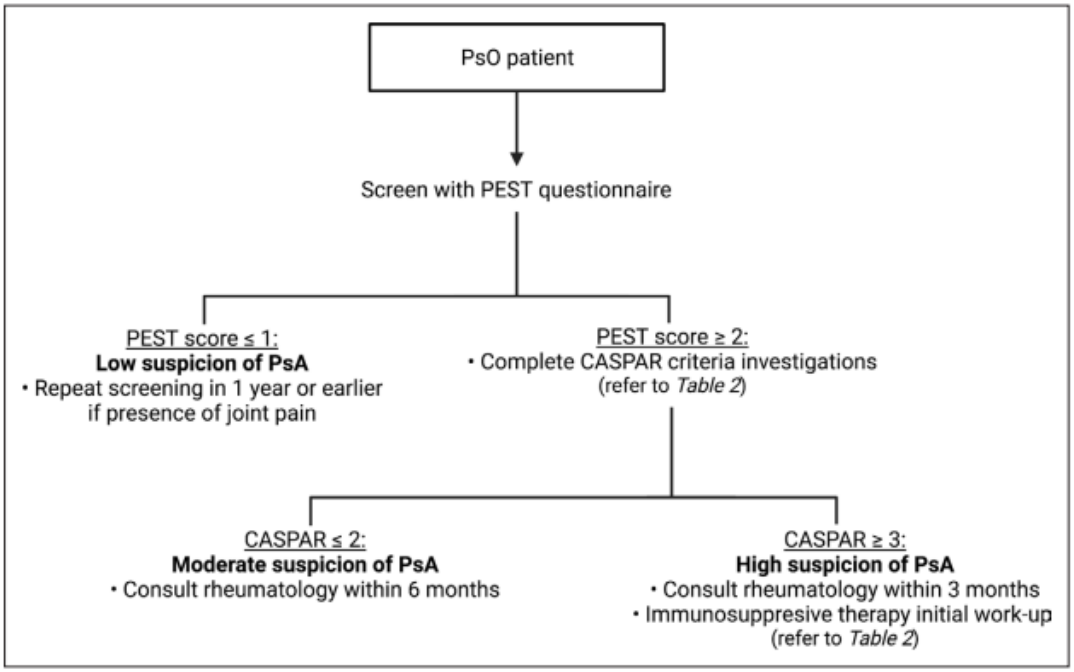
" One retrospective study done on Psoriasis epidemiology screening tool (PEST) is useful for the detection of psoriatic arthritis in the Japanese population A total of 143 patients with psoriasis were enrolled in this study. Among them, 29 patients were diagnosed with PsA. The frequency of PsA was significantly increased in patients with PEST scores > 3, with a sensitivity of 93.1% and a specificity of 78.9%. "[17]

" Prevalence of Psoriatic Arthritis in Nagano Prefecture, Japan, and Efficacy of the Psoriasis Epidemiology Screening Tool: A Real-World Survey prefecture-wide survey using the Psoriasis Epidemiology Screening Tool (PEST). Data were collected from 764 psoriasis patients, all of whom visited hospitals (55.1%) or clinics (44.9%) in Nagano Prefecture, Japan. The proportion of psoriasis patients with PsA was 6.5% (50 of 764); Based on the responses to the PEST, 18.1% of patients with psoriasis had joint symptoms. In contrast, 73.2% of psoriasis patients with joint symptoms did not have PsA. The PEST showed 52% sensitivity and 93.4% specificity for PsA".[18]

" Utilization of the validated Psoriasis Epidemiology Screening Tool to identify signs and symptoms of psoriatic arthritis among those with psoriasis: a cross-sectional analysis from the US-based Corrona Psoriasis Registry. Of 1516 patients with PsO, 904 did not have dermatologist-reported PsA; 112 of these 904 patients (12.4%) scored ≥3 and were significantly older, female, less likely to be working, and had higher BMI than patients with scores <3. They also had significantly longer PsO duration, were more likely to have nail PsO and had worse health status, pain, fatigue, Dermatology Life Quality Index and activity impairment. The PEST demonstrated superior performance compared with PAQ, with a sensitivity of 0.92 and a specificity of 0.78. Two 'headto-head' evaluations of three screening tools (comparing PASQ, PEST and ToPAS and PEST, EARP and PASE, respectively) in detecting PsA concluded that the PEST had the most favourable balance between sensitivity and specificity to screen for PsA" [19]

" Utilization of the Psoriasis Epidemiology Screening Tool (PEST): A Risk Stratification Strategy for Early Referral of Psoriatic Arthritis Patients to Minimize Irreversible Erosive Joint Damage suggested this algorism"

Fig. 1



[20]

"Although CASPER is diagnostic criteria, There are different screening tool to detect early PsA. Psoriatic arthritis screening: A systematic literature review and experts' recommendations: The search strategies retrieved 3,084 citations (including 429 duplicates) after the first selection process, 2,594 citations were rejected and 61 were selected for detailed review. Subsequently, 27 citations were excluded .result shows that The data of sensibility were as follows: PEST ranged from 27.5% to 92% , PASE ranged from 24% to 100% , EARP ranged from 78% to 100% , ToPAS ranged from 41% to 95.8% , ToPAS 2 ranged from 87.2% to 95.8% , SiPAT was 91% , PURE-4 was 85.7% , CONTEST ranged from 53% to 86% , PASQ ranged from 67% to 86.2% , ePASQ was 97.6% , and SiPAS was

79% [77]. Specificities were also variable but tended to be even higher than sensitivities: PEST ranged from 37.2% to 98% , PASE ranged from 19.5% to 94% , EARP ranged from 34% to 97.2% , ToPAS ranged from 29.7% to 97% , ToPAS 2 ranged from 87.2% to 98% , SiPAT was 69% , PURE-4 was 83% , CONTEST ranged from 71% to 91% , PASQ ranged from 64% to 88.8% , ePASQ was 75% , and SiPAS was 87%".[16]

3. Objective

3.1 General objective

To determine the magnitude and pattern of PsA at ALERT comprehensive specialized Hospital from may to july 2023.

3.2 Specific objective

To determine if there is association between clinical and sociodemographic veriable and High PEST value

To determine magnitude of PsA at ALERT hospital

To determine Pattern among patient with PsA

4. Methods

4.1 Study population , Area and period

4.1.1 Study Area

The study was conducted at All African Leprosy Rehabilitation and Training Center which is the main dermatologic referral center in Addis Ababa as well in Ethiopia. However, it has a range of special services like emergency and trauma centers, orthopedic, plastic and general surgery services and ophthalmologic services. It is located around Zenbework, kolfe keranyo sub city A.A.

4.1.2 Study period

The study conducted from June to July 2023 G.C

4.1.3 Study population

All psoriasis patients new or follow-up, who are attending dermatologic OPD for the study period.

4.1.4 Inclusion and Exclusion criteria

Inclusion criteria

All psoriatic patients will be available at ALERT dermatologic OPD

Exclusion Criteria

Patients with Mental illness that cannot answer questioner

Patients those under the age of 18 yrs

4.1.5 Variables

Dependent variable

Presence and absence of PsA

Independent variable

Socio-Demographics variables and clinical predictor of PsA

4.1.6 Sampling method and Sample size determination

Sampling method : Convenience sampling(non probabilistic sampling was used)

We will use single proportion formula for calculating our sample size:

$$n = \frac{Z(\alpha/2)2\ p\ (1-p)}{d2}$$

since there is no study conducted in Ethiopia, Population proportion was taken from Iranian study with p of 5 % and margin of error 5% and CI of 95%.

n = the minimum sample size required

Z = that is corresponding CI 95%, 1.96x1.96 = 3.8416

p = estimate of population proportion from previous study 5%

d = the marginal error tolerate to the sample 5%

n will be 73 and correction formula will make it 65 By taking n =550

Operational definition

Psoriatic arthritis is defined with PEST score of _>3 score .

Psoriasis is any patient with typical morphologic presentation

Mental illness any person who can not answer or explain his condition because of cognitive or behavioral problem.

Oligoarthritis involvement 2 or more but less than 5

Polyarthritis is greater than 5 joint involvement

Spondylitis vertebral joint involvement

4.2 Study design

Centered Hospital-based Prospective Cross-sectional Study

4.3 Data Collection Instruments & methods

The data collection tool used a structured questioner and weight and height were measured according to a calibrated scale.

The questionnaire was filled by Dermatovenerology residents after he/she took history and physical examination on the patients that have typical psoriasis morphology .It has 3 parts . These are sociodemographic part , about psoriasis and PEST questioners. Some of the variable like age severity and BMI changed from continuous to categorical diagnosis

4.3.1 Data Analysis

Data analysis done by SPSS version 22.0 and categorical data first analyzed by Frequency and then cross tabulation with dependent variable which is PEST score =>3 .and p value determined by chi square of independence and fisher exact test.and bi variate and multivariate analysis was done for those who have P value <0.25 on bivariate analysis and fulfilled all assumption logistic regression required. P value < 0.05 taken as significant. Severity of psoriasis found to be a confounding factor for the association between antipain use and PsA after we conformed with Cochran mantel test.

4.4. Ethical clearance

Before conducting research, ethical clearance requested from IRB of AAU and ALERT ethical committee and then after obtaining the clearance we conduced the research.

5. Result

5.1 General characteristics of Psoriasis

There were 65 patients with psoriasis involved in the study with a 99.9% response rate, among those involved in this study, there were 44(67.7%) male and 21(32.3%) female participants, with a mean age of 40.3-year with a standard deviation of 14.88 years, among the participant nearly half 32(49.20%) having age above 40 years old with a minimum age of 18 and maximum age of 75 years.

Among the participants who had a history of alcohol and smoking were 16 (24.2%) and 10(15.4%) respectively.

There were 4(6.5%) of the participants who had HIV and a similar amount of participants have a family history of psoriasis as well.

Of the participants having joint complaints, confirmed use of antipain accounts 5(7.7%).

. Among the participant who had Mild, Moderate and Severe psoriasis were 33(50.8%),15(23.1%), and 17(26.1%) respectively and also there BMI status stratified accordingly underweight, ideal weight, overweight and obesity study participant frequency for each group were 8(12.3%),45(69.2%), 10(15.4%) and 29(3.1%) respectively.

The distribution of psoriasis frequency in the participants were 18(10.5%), 30 (17.4%),25(14.5%),53(30.8%) and 46(26.7%) according to respective anatomy as follows nail, head and neck, trunk and Upper extremity and Lower extremity respectively.

There were 9(13.8%) of patients with psoriasis that had a PsA.

Table 3.Frequency of Socio Demographic Variable and Clinical predictors of PsA

VARIEBLES	Frequency And percent
Age	
<=40	33(50.8%)

>40	32(49.2%)
Sex	
Male	44(67.7%)
Female	21(32.3%)
Alcohol	
yes	16(24.6%)
No	49(75.4%)
Smoking	
yes	10(15.4%)
NO	55(84.6%)
HIV	
yes	4(6.2%)
NO	61(93.8%)
FAMILY History	
yes	4(6.2%)
NO	61(93.8%)
Anti Pain	
Yes	5(7.7%)
No	60(92.3%)
BMI	
<18.5	8(12.3%)
18.5<=X<24.9	45(69.2%)
25<=X<30	10(15.4%)
>=30	2(3.1%)

severity	
<3	33(50.8%)
3<=X<10	15(23.1%)
>=10	17(26.1%)

5.2 General characteristics of PsA

We have 13.9 % patient with PsA ,among these 5(55.5%) were male and 4(44.444%) were female with p(0.455)

The frequency of alcohol and smoking history(current and previous) in patients that had PsA were 2(22.2%) each respectively the frequency of HIV status and family history of psoriasis were 1(11.111%) each respectively. Among PsA the frequency of with ant pain use for joint symptom use frequency of 4(44.4 %.).

The pattern of PsA in our patient according to Moll's classification was (44.4%) 4 for oligoarthritis, 2 (22.2%) polyarthritis, 3 (33.3%%) predominantly hand joint, (22.22%) 2 spondyloarthritis, and 0% arthritis mutilans respectively and

and about the temporal relationship between the duration of psoriasis and joint symptoms, 66% had psoriasis skin manifestation precedes joint symptoms of PsA and 33% had concurrent onset between psoriasis skin manifestation and PsA.

Their BMI frequency according to their class of patients that have PsA were 8(88.8%) and 1(11.11%) for ideal body weight and obesity classes respectively. Whereas the frequency of severity of psoriasis in people having PsA were 2(22.22%),3(33.3%)and 4(44.4%) for Mild, moderate and severity respectively.

Table 4. illustrates the difference between PsA and Non-PsA based on one demographic variable and clinical predictor variable and normal frequency of demographic and clinical predictor.

VARIEBLES	PEST score		Odd Ratio	P value
	No PsA <3	PsA >=3	crude	Chi square /fisher exact
Age				
<=40	30(46.2%)	3(4.6%)	0.4333	0.303
>40	26/40%	6/9.2%		
Sex				
Male	39(60%)	5(7.7%)	0.544	0.455
Female	17/26.2%	4/6.1%		
Alcohol				
yes	14(21.5%)	2(3.1%)	0.8571	1.000
No	42/64.6%	7/10.8%		
Smoking				
yes	8(12.3%)	2(3.1%)	1.71	0.619
NO	48(73.8%)	7(10.8%)		
HIV				
yes	3(4.6%)	1(1.6%)	2.2	0.458
NO	53(81.5%)	8(12.3%)		
FAMILY History				
yes	3(4.6%)	1(1.6%)	2.2	0.458
NO	53/81.5%	8/12.3%		
Anti Pain				
Yes	1(1.5%)	4(6.2%)	44	0.01
No	55(84.6)	5(7.7%)		

BMI				
<18.5	8(12.3%)	0(0%)	1.442	0.504
18.5<=X<24.9	37(56.9%)	8(12.3%)		
25<=X<30	10(15.4%)	0(0%)		
>=30	1(1.5%)	1(1.6%)		
severity				
<3	31(47.7%)	2(3.1%)	2.106	0.084
3<=X<10	12(18.5%)	3(4.6%)		.
>=10	13(20%)	4(6.1%)		

Table 5. Pattern of PsA

Pattern of PsA	Frequency
Oligoarthritis only with out hand joints	3
Polyarthritis only with out hand joints	2
Predominantly hand joints	2
Osteoarthritis only	0
plus oligoarthritis	1
Polyarthritis	0
Hand joints	1
Arthritis mutilans	0

Table 6. Temporal relationship between psoriasis duration and joint symptom duration among PsA

Temporal relationship between PsO and PsA	Frequency

PsA following PsO	
0-5yrs	2
5-10yrs	2
>10yrs	2
PsO following PsA	0
Simultaneous	3
Total	9

The distribution of PsA arranged in descending order according to their frequency presented as follows 8(88.888%),7(77.7%) ,6(66.6%),6(66.6%) and 5(55.5%) for lower extremity, upper extremity, trunk and nail and lastly head and neck Respectively.

Table 7. Distribution of psoriasis note one patient could have more than on involvement.

Distribution of psoriasis	PEST Score		Frequency
	<3	>=3	
Nail	12(18.5%)	6(9.2%)	18(27.7%)
Head and neck	25(38.5%)	5(7.7%)	30(46.2%)
trunk	19(29.3%)	6(9.2%)	25(38.5%)
Upper Extermity	46(70.8%)	7(10.7%)	53(81.5%)
Lower Extermity	38(58.5%)	8(12.3%)	46(70.8%)

5.3 PEST Questioner Result

Out of all psoriatic patients involved in this study, who answered Yes to the question Have you ever hand swollen joint was 15(23.1%), whereas those people who had a PSA 9(100%) and also for the question Has a Doctor told you that you have arthritis of all psoriatic patient who answered yes and for whom having a PsA were 6(66.6%) and 5(66.6%) respectively.

For questions Have you ever had a finger or toe that was completely swollen and painful for no apparent reason were 7(10.8%) and 5(55.5%) for those who answered yes out of all participants and having PsA respectively.

For the question Have you ever had pain in your heel? who answered yes out of all psoriatic patients and having a PsA were 14(21.5%) and 5(55.5%) respectively.

For the question Do your fingernail or toe nail have a hole and pit answered yes and for those having PsA were 15(23.1%) and 6 (66.6%) respectively.

When we take Q1, QandQ5 of PEST we get a frequency of joint complaint 44(67.6%) out of all psoriatic patients

Table 8 PEST Questionnaire frequency and difference between PsA and Non PsA.

Variable		PEST Score		Frequency
		<3	>=3	
Q1	Have you ever had swollen joint?			
	yes	6(9.2%)	9(13.9%)	15(23.1)%
	No	50(76.9%)	0(0%)	50(76.9%)
Q2	Has a doctor ever told you that you have arthritis?			
	yes	1/1.5%	5(7.7%)	6/9.2%
	No	55(84.6%)	4(6.2%)	59/90.8%
Q3	Do your finger nail or toe nail have a holes and Pits ?			
	yes	9(13.9)	6(9.2%)	15/23.1%

	No	47(72.3%)	3(4.6%)	50/76.9%
Q4	Have you ever had pain in your heels?			
	yes	9(13.9%)	5(7.7%)	14(21.5%)
	No	47(72.3%)	4(6.2%)	51(78.5%)
Q5	Have you ever had a finger or toe that was completely			
	Swollen and painful for no apparent reason?			
	yes	2(3.1%)	5(7.7%)	7(10.8%)
	No	54(83%)	4(6.2%)	58(89.2%)

Table 9. Multivariable analysis and Bivariate logistic regression

Variable	Adjusted odd ratio	adjusted CI	P value	crude Bivariate analysis/crude odd
Nail	7.229(.859-61.030	0.069(.859-61.030)	0.01	7.33
Anti pain use	39.085	0.012(2.220-688.08)	0.01	44
trunk	1.598	0.644.(.219-11.683)	0.074	3.895
Duration of joint symptom	1.476	0.03(1.039-2.097)	0.007	1.438

In our study we conducted Bivariate and Multivariate logistic regression for psoriatic arthritis clinical risk factors and found out that Nail lesion ,duration of joint symptom and antipain use for joint symptom were significant and there crude odd ratio were 7.33,1.438, and 44 respectively. When we see adjusted odd ratio for

the the above parameter only duration of joint symptom and Antipain use were statically significant with 39. 09 and 1.476 respectively.

6.Discussion

We have found that PsA magnitude in our study using PEST was 13.8% among psoriatic patients. When we first compared with studies done in different parts of Africa, especially sub-Saharan Africa shows prevalence ranges from 0% to 7% with some of the reports having higher number of HIV positivity which is a little bit lower than what we are found in our study[24-28].On the contrary, Our result is almost comparable to one systematic review and meta-analysis study that included 266 studies across six continents out of these 3 were from Africa found that the prevalence of PsA was 15.5% in Africa [21].On the contrary, one cross-sectional observational study done in Egypt stated the prevalence of PsA around 30%[9] and in another study reviewing this matter done in Africa the Middle East prevalence was in the range of 0%-5%. From these sporadically isolated studies we cannot reliably give a conclusion or reason for this discrepancy. Because some of the studies use different methods and definitions than we are using now. As a result, we can say for sure these study shows a lower prevalence when compared to Caucasians who have more than 20% prevalence [21} . This might be genetic differences and some other unidentified environmental and genetic factors that have protective effects as concluded by sub-Saharan studies and reviews [8]. The Egyptian study and our study have a higher magnitude than other African studies these studies were done recently and the result might be explained by Western dietary influence is more in recent studies compared to the previous study. These were similar to trends seen in Japanese studies.{17,22,23} and the other reason is that hospital-based studies have a higher prevalence than population-based studies [18]

Our study found that out of all involved psoriatic patients 13.8% were newly diagnosed which made an undiagnosed rate of 13.8%. This result is comparable to one meta-analysis study by Vellani et al found that an undiagnosed rate of 15.5% of all studies included and 10.1 % only epidemiological studies considered. [37]

Gender wise there is a male predominance in our study which accounts for 55.5% of all PsA patients which is comparable to studies done in India and Korea[36,35]

When we examine the temporal relationship between the duration of psoriasis and the duration of joint symptoms almost 6(67%). among psoriatic arthritis patients the joint symptom followed after psoriatic onset and the rest or 33% occurred simultaneously. These findings are almost similar to what has been stated in Rooks's textbook of dermatology. According to the text, the temporal relationship is because of the association of two diseases with HLA genes. These are HLA: cW06 and HLA B27 most patients have these genes characteristically present in such a way that the psoriasis precedes the joint symptom by 10 years and simultaneous occurrence respectively. According to this study, we can hypothesize that more than half of the PsA patients in our study have the HLA cw06 gene though we did not test the gene directly in our study.

The pattern of distribution of PsA in our study shows predominantly oligoarthritis and polyarthritis patterns. The frequency of joint involvement is different according to race and country. In general, oligoarthritis is a common pattern worldwide which is similar to what we have seen in our study[1] but other studies showed that oligoarthritis pattern as predominant type in Chinese and Sing/Korean studies. The explanation might be the duration of joint symptoms in our study which is early 0r 3 yrs because poly arthritis is seen in those having prolonged joint symptoms [18}. Another explanation will be HLA type for example a Japanese study peripheral joint involvement common than axial because of the low prevalence of HLA B27 this fact might explain our result.

Regarding the PEST questionnaire, the first q1 had the highest positive response frequency(100%) than the other questioner which is a relatively higher response rate than the Japanese study and the base Corona study has a response rate 88%.[17]

In Our study, joint-related complaints were 67% among psoriatic patients while 13.8% were PsA. That is a result of non-PsA joint complaints of 35% attributed to another subtype of psoriasis with joint complaints. As the result not all psoriasis patients with joint complaints should not be interpreted as PsA[18].

For the question Have you ever had pain in your heel? who answered yes out of all psoriatic patients and having a PsA were 14(21.5%) and 5(55.5%) respectively This question is also representative of enthesitis, which is a hallmark of PsA and a sign of severity. In these studies, our PsA patients had a frequency of PsA 55% when compared to all PsA patients involved in the study, which has a slightly higher amount seen in another study the prevalence[30%-50]%.[32]This might be because of the lower sensitivity of PEST and we did not do any radiologic or rheumatologist confirmation.

Psoriatic arthritis has several clinical predictors like scalp psoriasis, Nail psoriasis and flexural psoriasis, In this study none of the parameters are associated with PsA. In contrast to the study done in Egypt using PEST by El-graf et al [9] and US based study by Wilson et al [33]

But Anti Pain use for joint symptoms and duration of joint symptoms are significantly associated with PsA. The explanation might be we have poor screening and diagnosing PsA as evidenced by Q2 of PEST which suggested around 44% were not told by their doctor about their arthritis as a result patients may tend to take it as a Painkiller or they took it for Non-PsA arthritis and triggered PsA.

6. Conclusion

This study found that the prevalence of PsA using PEST tools is 13.8% and 13.8 % of the undiagnosed rate. This finding suggested that it is not a rare disease.

We found out that the oligoarthritis pattern is the most common pattern of PsA.

Antipain use and long duration of joint symptoms were associated with PsA

Not all patient with psoriasis with joint symptoms is classified as PsA.

7. Limitations of the study

First, it is a single-centered cross-sectional study. As a result, it is not a representative study for the whole population. So, the next large population-based cohort study required with large sample size. When we conducted this research we took a validity test done on PEST by another country because of time limitation issues and also related to ethical clearance for radiological investigation involving the study .so, we cannot verify PsA patients diagnosed by PEST by a gold standard CASPER classification. Since we use the English version of PEST Translated By Residents.

8. Recommendation

The fact that we have 13.8% of our patients identified as PsA by PEST requires integration of the PEST questionnaire in routine psoriatic patient evaluation.

We should do a validity test of PEST in the future for our country. involving rheumatologist

We should consider anti pain use as one of the predictors of PsA instead of 2nd question of PEST after a large study.

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10.APPENDIXES

10.1 Consent form

10.1.1 Invitation

I am Dr Ababiya Tafesse , a Dermaovenerology year 3 postgraduate resident at Addis Ababa university college of health science. As final year resident I am expected to do research on the area I am studying for partial fulfillment of my certification, Accordingly, I selected this topic to study which has full ethical clearance by research committee of both AAU and ALERT. As the result , I welcome you to participate in the study that improve our understanding of PsA in our context by participating on this research . If you are willing .

10.1.2 Patient information

Title Magnitude and pattern of PsA at ALERT Hospital using PEST

Contact Dr Ababiya Tafesse R3 0985400216

Background PsA is one of the most common complication and underdiagnosed disease in psoriatic patient upto 15% of cases that lead to permanent damage to joint disease

Study purpose to have study on PsA in our setup and to adopt easy screening tool in routine OPD setup for PsA for early diagnosis and decrease disability associated with late diagnosis.

Procedure during OPD monthly follow up of psoriatic patient those eligible asked for voluntary participation and asked and filled the questioner about their disease by their respective doctor**,**

Risk and benefit no direct risk and benefit **.**

Voluntary and confidentiality no direct consequence , if you are decided not to participate**.** Your name is not mentioned and protected by patient doctor confidentiality.

Consent

I am fully understand the purpose, benefit and risk by language I know. I voluntary participating and I confirm my willingness by signing

Siginture

Thank you

10.2 Questionnaire

Card no

Age

Sex

Duration of psoriasis

Duration of joint symptom

Any anti pain use for joint symptom

Severity of psoriasis by % body surface involvement

Distribution of psoriasis by anatomic site including nail

Family history of psoriasis

HIV positivity

BMI

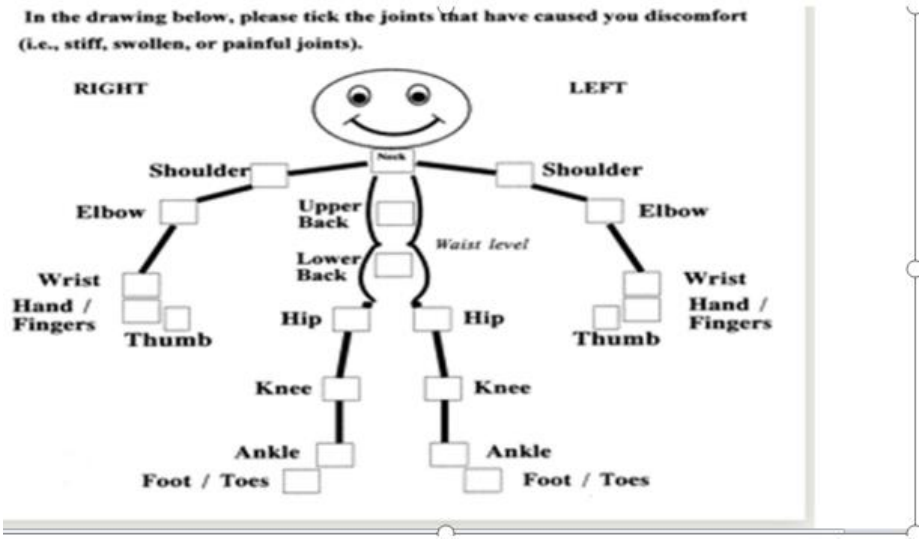
Alcohol history and amount per wk

Smoking history (current or previous)

Table 10. PEST Questions

N°	Questions	Yes	No
1	Have you ever had swollen joints or joint		
2	Has doctor ever told you that you have arthritis		
3	Do your finger nail or toe nail have pit or hole		
4	Have you had pain on your heel		
5	Have you had finger or toe that was swollen for no apparent reason		

Fig.2


In the drawing below, please tick the joints that have caused you discomfort (i.e., stiff, swollen, or painful joints).
RIGHT
LEFT
Neck
Shoulder
Shoulder
Elbow
Upper Back
Elbow
Waist level
Lower Back
Wrist
Wrist
Hand / Fingers
Hip
Hip
Hand / Fingers
Thumb
Thumb
Knee
Knee
Ankle
Ankle
Foot / Toes
Foot / Toes