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PREVALENCE OF SEVER PSORIASIS AMONG ADULT PATIENT AT KING FAHD HOSPITAL OF THE UNIVERSITY (KFHU), KHOBAR, KSA 2018

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Abstract:
Background: *Psoriasis is the most common T helper 1 mediated inflammatory disease, affecting more than 125 million people worldwide [1]. About 60% of psoriasis patients suffer from moderate to severe disease, i.e. more than 10% of the body surface area is covered by psoriatic plaques [2].*
Objectives: *To assess the prevalence of sever psoriasis among adult patient at King Fahd Hospital of the University (KFHU), Khobar, KSA 2018*
Method: *A retrospective case-control study was done on 50 patients who suffered from psoriasis by utilizing the charts of patients who selected randomly by accessing to management report viewer records through information technology (IT) department in King Fahd Hospital of the University.*
Results: *Our cohort included 50 patients with confirmed psoriasis. Psoriasis severity was determined in 35 patients (70%). The age of our cohort ranged from 15 to 72 years with the mean of 31.4 years. The statistical analysis reported a significant correlation between age and PASI score regarding to the severity (P-value= 0.033 and 0.000 respectively), also a significant correlation between gender regarding to the severity of psoriasis (P-value= 0.000). Regarding to the severity of psoriasis among the two studied groups showed a significant correlation between the number of patients with PASI score more than 10 and the occurrence of severe psoriasis (P-value=0.001)*
Conclusion: *the prevalence of psoriasis was higher among females. The mean age of our cases was 31.4 years. Our study depends on the PASI score to recognize the severe cases of psoriasis where we classify them according to it. Smoking and arthritis are risk factors for severe psoriasis.*
Keywords: *Psoraisis, Severe psoraisis, psoriasis area severity index (PASI).*

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INTRODUCTION:

Psoriasis is the most common T helper type 1 inflammatory disease, affecting more than 125 million people worldwide [1]. About 60% of psoriasis patients suffer from moderate to severe disease, i.e. more than 10% of the body surface area is covered by psoriatic plaques [2]. Psoriasis Area and Severity Index (PASI) is the most widely used tool for the measurement of severity of psoriasis. PASI combithe assessment of the severity of lesions and the area affected into a single score in the range 0 (no disease) to 72 (maximal disease) [3].

A diagnosis of psoriasis is usually based on the appearance of the skin. Skin characteristics typical for psoriasis are scaly, erythematous plaques, papules, or patches of skin that may be painful and itch [4]. Depending on the severity of disease, appropriate treatment can be initiated. For mild to moderate disease, first-line treatment involves topical therapies including corticosteroids, vitamin D3 analogues, and combination products. These topical treatments are efficacious and can be safely initiated and prescribed by primary care physicians. Patients with more severe and refractory symptoms might require further evaluation by a dermatologist for systemic therapy e.g Methotrexate and biological therapy [5]. Methotrexate is an inhibitor of folate biosynthesis, used for its cytostatic and anti-inflammatory properties in the treatment of moderately severe to severe psoriasis, as well as psoriatic arthritis [6]. Biologics have emerged as highly potent treatment options in patients for whom traditional systemic therapies fail to achieve an adequate response, are not tolerated owing to adverse effects, or are unsuitable owing to comorbidities [7]. Family history is the best-established risk factor for developing psoriasis [8]. Psoriasis is associated with increased atherothrombotic diseases, including myocardial infarction, deep venous thrombosis, and reduced life span. Both disease-specific and non–disease-specific risk factors are likely to fuel one another in deleterious vicious circles. Disease-specific risk factors are those that are a direct consequence of psoriasis inflammation and include hyperhomocysteinemia, elevated C-reactive protein, elevated blood inflammatory cytokines, and platelet hyperactivity. Non–disease-specific risk factors include insulin resistance/diabetes, obesity, dyslipidemia, hypertension, metabolic syndrome, and habitual tobacco smoking [9].

LITERATURE REVIEW:

Psoriasis is a chronic, non-infectious disease that affects people of all ages, with no predilection for sex. This systematic literature investigated the prevalence of sever psoriasis among adult patient at King Fahd Hospital of the University (KFHU), Khobar, KSA 2018. Searches were done by reviewing journals and articles found in the following databases: PubMed, CINAHL and the Cochrane Library. Several articles that were not accessible by full text from the databases were obtained using Google Scholar. Key search terms were the global prevalence of severe psoriasis, the prevalence of psoriasis in Arabian countries and the prevalence of psoriasis in Saudi Arabia.

Important factors in the variation of the prevalence of psoriasis include age, gender, geography, and ethnicity, probably due to genetic and environmental factors. Higher prevalence rates have been reported at higher latitudes, and in Caucasians compared with other ethnic groups [10].

In 2012, a 2-week psoriasis screening study via medical consultation was performed in three countries simultaneously – Algeria, Tunisia and Morocco, where incidence of psoriasis was estimated at 10.36, 13.26 and 15.04 per 1000, respectively [11].

A study conducted by Fatani et al., (2002) [12] which concerned with the incidence of psoriasis in the Saudi Arabia reported that there was a male preponderance with sex ratio of 1.4:1. The mean age of onset in males was 26.9 years while in females it was 22.3 years. Fifty-three percent of psoriatic cases developed before the age of 30 years. Family history of psoriasis was recorded in 8.4% of the cases. Itching was the only symptom reported by patients in 43% of cases. The sites of involvement were as follows: lower extremity 44.9%, scalp 41.8%, and nail 26.6% and palmoplantar 12.6%. Plaque psoriasis was the most common clinical type (87.1%), followed by erythroderma (4.2%), pustular (3%), guttate (1.9%), flexural, (2.3%) and follicular (0.4%). Finally, they concluded that the clinical features of psoriasis in our patients were similar to those reported from other parts of the world [12].

The epidemiology of psoriasis in the Saudi Arabia is not clear so more studies were recommended. This study concerned with the prevalence of sever psoriasis among adult patient at King Fahd Hospital of the University (KFHU), Khobar, and KSA 2018.

PATIENTS AND METHODS:

A retrospective case-control study was done on 50 patients who suffered from psoriasis by utilizing the charts of patients who selected randomly by accessing to management report viewer records through information technology (IT) department in **King Fahd**

Hospital of the University. Our patients were selected according to the inclusion criteria and they visited the dermatology clinic from 1/1/2018 … to 29/3/2018….. In this study, the severe **p**soriasis cohort was defined based on either the **PASI Score (if the PASI score**>10 the patient was diagnosed as severe psoriasis case**) or receiving the** methotrexate **or biological treatment as a systemic treatment.**

SAMPLE SIZE CALCULATION:

The following formula for calculating sample size for a single proportion was used to calculate the sample size for women to be enrolled into the study:
$n = (Z^2/d^2)$ PQ
Where z = risk of Type I error
d = absolute precision
p = expected prevalence
q = 1- p

Inclusion Criteria:

- Patients who diagnosed with psoriasis

Exclusion Criteria:

- Patients who diagnosed with other skin disease.

The study population was divided into 2 groups

- sever psoriasis
- Non- severe psoriasis

Data obtained from the database

- Socio-demographic characters including age, gender and marital status.
- Risk factors for the occurrence of psoriasis.
- PASI score
- The way by which the psoriasis was diagnosed.
- The type of treatment.
- The family history.

STATISTICAL ANALYSIS:

Statistical analysis was done using SPSS 16.0 statistical software package. Results were presented as mean and standard deviation for quantitative data, frequencies and percent for qualitative data. Independent t-test was used to compare quantitative variables between two study groups. Chi-square test was used for comparing qualitative variables between groups, Fisher exact test was used instead of chi-square with two by two tables when expected cell count less than five. A probability value of less than or equal 0.05 was considered statistically significant.

RESULTS:

Our cohort included 50 patients with confirmed psoriasis. Psoriasis severity was determined in 35 patients (70%) (Figure 1). The determination of psoriasis severity depended either on the psoriasis area severity index (PASI) score or on receiving systemic treatment. If the PSAI score was higher than 10 the patient was diagnosed with severe psoriasis. In our study, the systemic treatment was either receiving biological treatment or Methotrexate.

Table1 describes the demographics of the study population. The age of our cohort ranged from 15 to 72 years with the mean of 31.4 years. 33 (66%) of our patients were females. 31 (62%) were married.

Information on risk factors for psoriasis including; smoking, diabetes mellitus (DM), dyslipidemia, hypertension (HTN) and arthritis was available for 22 (44%), 31 (62%), 27 (54%), 33 (66%), 29 (58%) of the patients, respectively (Figure 2) (Table2). The BMI of our patients ranged from 18 to 48 Kg/m^2 with the mean of 28.2. 27 (54%) were obese (BMI more than 30) (Table 2). The mean of duration of diagnosis of psoriasis was 7.59 years and ranged from 1 to 30 years. A PASI score is a tool used to measure the severity and extent of psoriasis. Our results estimated that the PASI score of our patients ranged from 1 to 22. The interpretation of PASI score was if the PASI score was higher than 10 the patient was diagnosed with severe psoriasis. Among our patients 17 (34%) were diagnosed with severe psoriasis (Table 2).

The diagnosis of psoriasis mainly depended on the appearance of the skin and on the clinical diagnosis, however in some cases the patient asked to perform a biopsy pathological examination to confirm the diagnosis of psoriasis. 43 (86%) of our patients were clinically diagnosed while the remaining (14%) were diagnosed through the histopathological examination of skin biopsy specimen. 35 (70%) of our patients had a family history of psoriasis. 18 (36%) received topical treatment, 17 (34%) received biological treatment while the remaining (30%) received the Methotrexate (MTX) treatment (Table 2) (Figure 3).

By comparing the means of quantitative parameters of the two studied groups (patients had severe psoriasis and patients hadn't severe psoriasis) including age, BMI, PASI score and duration of diagnosis by using the independent t-test, the statistical analysis reported a significant correlation between age and PASI score regarding to the severity (P-value= 0.033 and 0.000 respectively), where the mean of age was higher among non-severe patients (36.93 years) while the

mean of PASI score was higher among severe patients (11.4) (Table 3). There was no significant correlation between both the means of BMI and duration of diagnosis regarding to severity (P-value= 0.624 and 0.066 respectively) (Table 3).

By comparing the demographic features of the two studied groups including gender, marital status and BMI by using the Chi-square test, the statistical analysis estimated a significant correlation between gender regarding to the severity of psoriasis (P-value= 0.000), where the occurrence of sever psoriasis was higher among females (Table 4).

Regarding to the method by which the psoriasis was diagnosed 43 (86%) of our patients were diagnosed clinically while the remaining 7 (14%) were diagnosed using a skin biopsy (Table %). The results of Chi-square test for comparing between the frequency of diagnostic tools and PSAI score regarding to the severity of psoriasis among the two studied groups showed a significant correlation between the number of patients with PASI score more than 10 and the occurrence of severe psoriasis (P-value=0.001) while there was no significant correlation between the type of diagnostic tools used in the psoriasis diagnosis and the severity of the disease (P-value=0.415) (Table 5). Our results also estimated a significant correlation between smoking and arthritis as a risk factors for the incidence of severe psoriasis (P-value=0.012 and 0.000 respectively) while there was no significant correlation between diabetes mellitus, dyslipidemia and HTN regarding to psoriasis severity (P-value= 0.144, 0.577 and 0.474 respectively) (Table 6).

Table 1:Socio-detmographic among the 50 patients of study

Socio-demographic		**No (50)**	**%**
Age			
	Mean±SD	**31.4±12.1**	
	Min/Max	**15/72**	
Gender			
	Male	**17**	**34.0**
	Female	**33**	**66.0**
Marital Status			
	Single	**19**	**38.0**
	Married	**31**	**62.0**

Table 2:Table 2: Risk Factor , Diagnosis and Severity among study participants

Characteristics		No	%
Risk Factor			
	Smoking	**22**	**44.0**
	DM	**31**	**62.0**
	Dyslipidemia	**27**	**54.0**
	HTN	**33**	**66.0**
	Arthritis	**29**	**58.0**
BMI			
	Mean±SD	**28.2±7.6**	
	Min/Max	**18/48**	
	<30	**23**	**46.0**
	30+	**27**	**54.0**
Diagnosis duration in year			
	Mean±SD	**7.7±5.9**	
	Min/Max	**1/30**	
PASI Score			
	Mean±SD	**9.36±4.98**	
	Min/Max	**1/22**	
	≤10	**33**	**66.0**
	>10	**17**	**34.0**
Diagnosis			
	Clinical	**43**	**86.0**
	Biopsy	**7**	**14.0**
Family History			
	Positive	**35**	**70.0**
	Negative	**15**	**30.0**
Treatment			
	Biological	**17**	**34.0**
	Topical	**18**	**36.0**
	MTX	**15**	**30.0**
Severity			
	Yes	**35**	**70.0**
	No	**15**	**30.0**

Table 3: The correlation between Mean & SD of age, BMI, PASI score and duration of diagnosis between the two studied groups:

Characteristics	Mean±SD		T-test	P-value
	Yes	No		
Age	**28.94±10.1**	**36.93±14.7**	**2.228**	**0.031**
BMI	**27.83±7.2**	**29.00±8.7**	**0.493**	**0.624**
PASI score	**11.40±4.4**	**4.60±2.4**	**3.232**	**0.000**
Duration of Diagnosis	**8.67±6.5**	**5.33±3.4**	**1.883**	**0.066**
Independent t-test				

Table 4: The correlation between the demographic features and severity of psoriasis between the two studied groups

Socio-demographic	No	Severity				Chi Square	P-value
		Yes (35)		No (15)			
		No	%	No	%		
Gender							
Male	**17**	**6**	**17.1**	**11**	**73.3**	**14.774**	**0.000**
Female	**33**	**29**	**82.9**	**4**	**26.7**		
Marital Status							
Single	**19**	**14**	**40.0**	**5**	**33.3**	**0.198**	**0.656**
Married	**31**	**21**	**60.0**	**10**	**66.7**		
BMI							
<30	**23**	**18**	**51.4**	**5**	**33.3**	**1.384**	**0.239**
30+	**27**	**17**	**48.6**	**10**	**66.7**		

Table 5: The correlation between the frequency of diagnostic tools and PSAI score regarding to the severity of psoriasis among the two studied groups:

Characteristics	No	Severity				Chi Square	P-value
		Yes (35)		No (15)			
		No	%	No	%		
Diagnosis							
Clinical	**43**	**31**	**88.6**	**12**	**80.0**	**0.641**	**0.415**
Biopsy	**7**	**4**	**11.4**	**3**	**20.0**		
PASI in two groups							
<=10	**33**	**18**	**51.4**	**15**	**100.0**	**11.039**	**0.000**
>10	**17**	**17**	**48.6**	**0**	**0.0**		

Table 6:The correlation between risk factors regarding

Risk Factor	No	Severity				Chi Square	P-value
		Yes (35)		No (15)			
		No	%	No	%		
Smoking	**22**	**11**	**31.4**	**11**	**73.3**	**7.483**	**0.012**
DM	**31**	**24**	**68.6**	**7**	**46.7**	**2.138**	**0.144**
Dyslipidemia	**27**	**18**	**51.4**	**9**	**60.0**	**0.311**	**0.577**
HTN	**33**	**22**	**62.9**	**11**	**73.3**	**0.514**	**0.474**
Arthritis	**29**	**28**	**80.0**	**1**	**6.7**	**23.180**	**0.000**

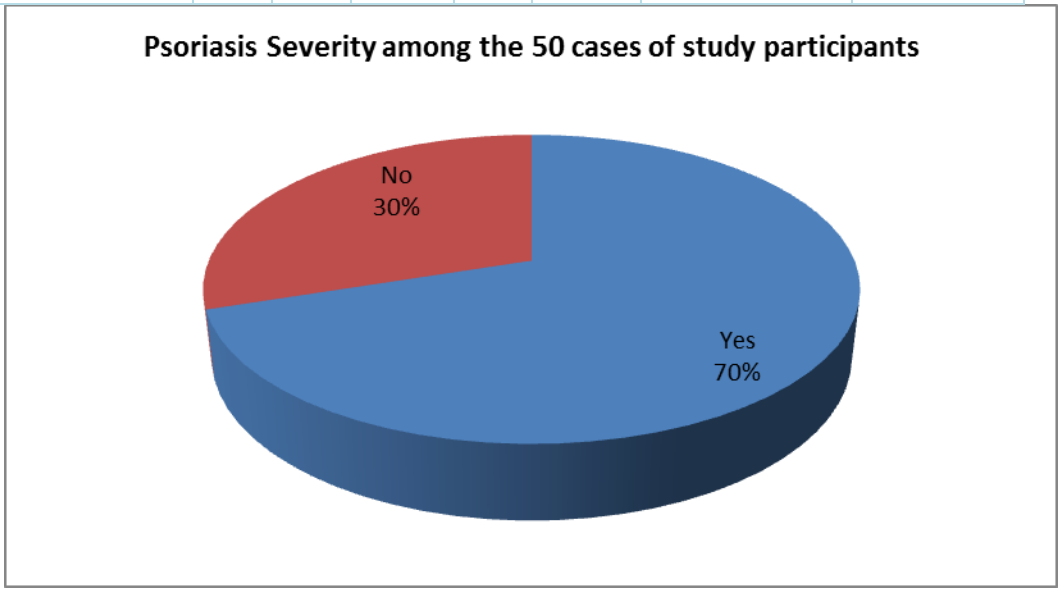

Figure 1:the percentage of psoriasis severity among the 50 cases of study participants.

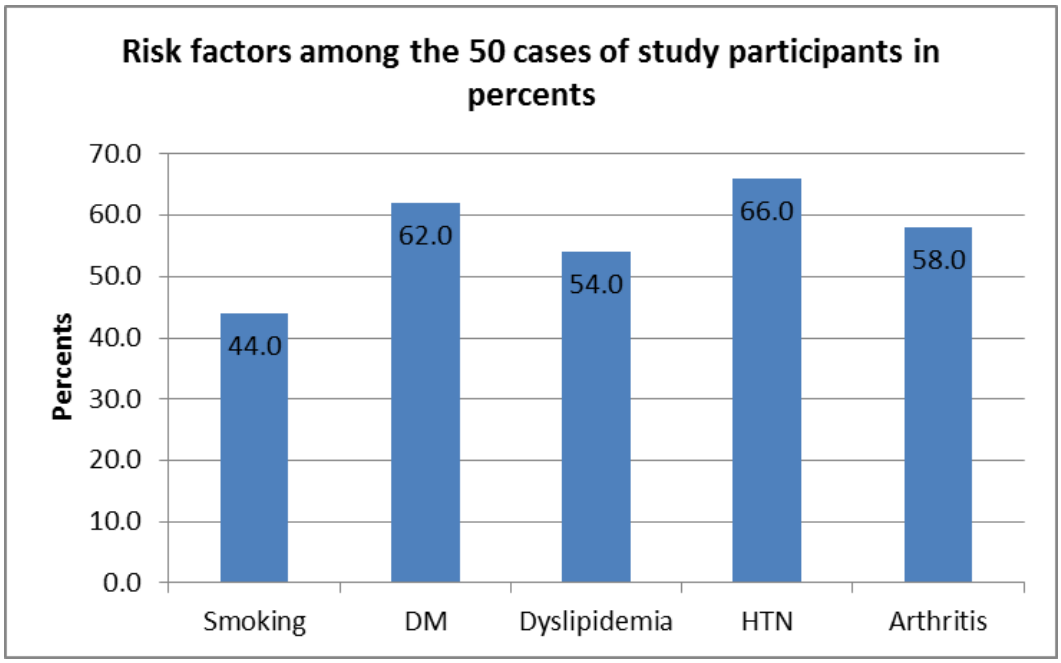

Figure 2:The distribution of risk factors of psoriasis among the 50 cases of study participants.

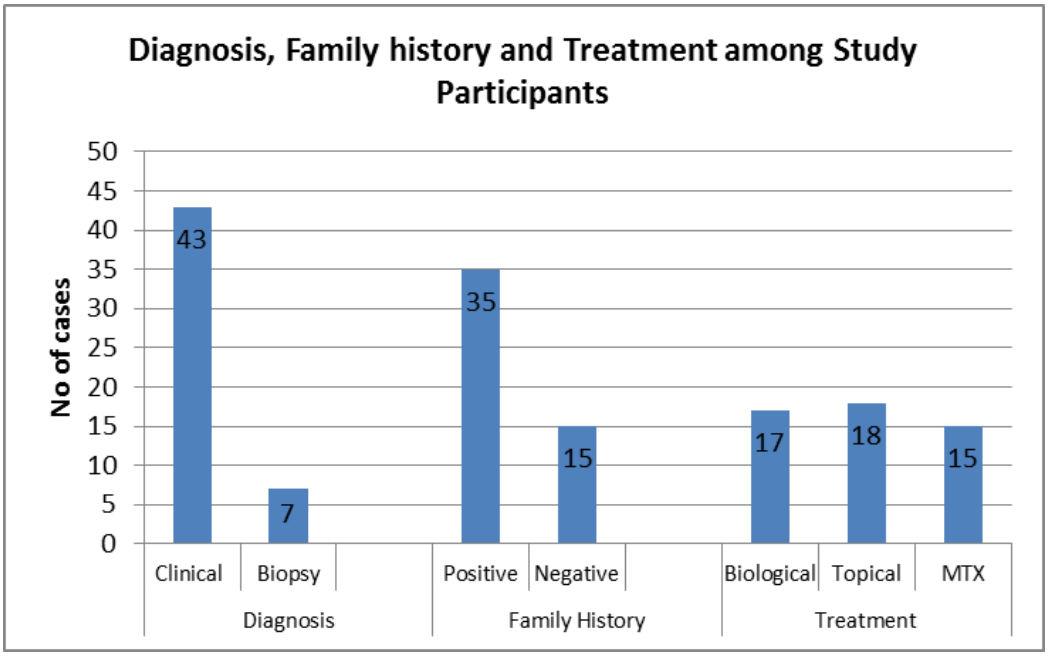

Figure 3:The diagnosis, family history and treatment among the study participants.

DISCUSSION:

Our study was reported that the age of our cohort ranged from 15 to 72 years with the mean of 31.4 years. Most of our participants were married females. Mainly our cases were diagnosed clinically and only few cases were diagnosed through the histopathological examination of skin biopsy specimen. Most of them had a family history of psoriasis. Regarding to the type of treatment; 18 (36%) received topical treatment, 17 (34%) received biological treatment while the remaining (30%) received the Methotrexate (MTX) treatment. The statistical analysis reported a significant correlation between age and PASI score regarding to the severity, where the mean of age was higher among non-severe patients while the mean of PASI score was higher among severe patients. Regarding to the risk factor for severe psoriasis, we reported a significant correlation

between smoking and arthritis as a risk factors for the incidence of severe psoriasis while there was no significant correlation between diabetes mellitus, dyslipidemia and HTN.

Psoriasis has been sub classified according to age of onset. Early onset psoriasis (also referred to as type I) has onset before the age of 40 years, with peak onset at 16–22 years of age, and comprises 70% of all psoriatics. Late-onset psoriasis, also termed type II psoriasis, shows onset at or after age 40 years, with a peak age of onset between 57 and 60 years [13, 14]. Regarding to this classification our cohort included the three categories of psoriasis where the age of our cohort ranged from 15 to 72 years. Some studies indicated the average age of onset for psoriasis was 33 years of age, and 75% of cases occurred before 46 years of age [15], this study agreed with our results which reported that the mean age of our cases was 31.4 years.

Hägg et al., 2017 [16] reported that women have less severe psoriasis compared with men, after controlling for several possible confounders, these results disagreed with our results which estimated that the prevalence of sever psoriasis was higher among females (82.9%) than in males (17.1%).
The *psoriasis area severity index* (PASI), which is used for clinical evaluation, and the *dermatology life quality index* (DLQI), for quality of life assessment, are the most cited and most often used tools due to their high degree of reliability, applicability and reproducibility [17, 18]. Our study depends on the PASI score to recognize the severe cases of psoriasis where we classify them according to it. If the PASI score was higher than 10 the case was classified as severe psoriasis.

Current treatment guidelines for psoriasis recommend topical therapies for mild disease, either as monotherapy or in combination with phototherapy, and traditional oral systemic agents (e.g., methotrexate), or biologic agents (e.g., anti-tumor necrosis factor inhibitors) for moderate to severe disease [19, 20]. While our study was managed by considered the patient who received both the MTX and the biological treatment as a severe patient and we found that 18 (36%) received topical treatment, 17 (34%) received biological treatment while the remaining (30%) received the Methotrexate (MTX) treatment, then we have 35 severe cases among our participants.

Obesity plays a role in inflammation because fat acts as an endocrine tissue through the production of cytokines such as interleukin 6 and TNF-α [21]. Bhole *et al*. [22] investigated differences in BMI in PsA, Ps, RA and general population. They observed that individuals with Ps, PsA and RA were at a greater risk of obesity than the general population. Bardazzi *et al*. [23] showed that patients who decreased their weight achieved a PASI score of 90 or 75 even if they did not respond at first. Among our patients the BMI wasn't correlated with the psoriasis severity (Table 4).

Azfar et al 2011 [24] conducted a large cohort study of 108,132 psoriasis patients. After controlling for age, sex, BMI, hypertension, and hyperlipidemia, psoriasis was found to be an independent risk factor for incident type 2 DM. The risk was greatest in patients with severe disease. Our results agreed with Azfar where we reported that the was no significant correlation between the incidence of DM and psoriasis severity but the number of diabetic patient was higher among the severe group (68.6%).

Several purported mechanisms underlying the association between dyslipidemia and psoriasis are the activation of Th1 cells, autoantibodies recognizing oxidized LDL, and psoriasis medications such as oral retinoids and cyclosporine [25]. Specifically, the cytokines IL-1, IL-6, and TNF-alpha that mediate psoriasis may alter the function of hepatocytes and arterial smooth muscle cells, resulting in altered lipoprotein compositions, enhanced expression of cellular adhesion molecules, and increased lipid deposition on arterial walls. These processes ultimately lead to the development of arterial plaques [25]. Cytokines increase the expression of matrix metalloproteinase, which degrade the plaque's fibrous cap. Eventually, the plaque may rupture and life-threatening thrombi may form [25, 26].

A research conducted in Middle East, prevalence of dyslipidemia in those affected by psoriasis is 14.1% for mild to medium psoriasis, (PASI<10), 22.48% for severe psoriasis (PASI>10), and in the control group 4, 96% [27], while our results reported that, prevalence of dyslipidemia in those affected by psoriasis is 60% for mild to medium psoriasis, (PASI<10), 51.4%for severe psoriasis (PASI>10).

Psoriasis has been associated with systemic inflammation and medical comorbidities such as cardiovascular disease and diabetes. Psoriatic arthritis (PsA), a chronic inflammatory arthritis, affects about-10% of patients with psoriasis overall,[28] with a higher prevalence in patients with more extensive skin disease and a prevalence as high as 30% in dermatology clinics (where patients tend to have more extensive/severe psoriasis) [29]. Three

additional studies have been recently published assessing risk factors for the development of PsA and psoriasis (jointly) among the population studied.[30-32], these studies agreed with us where we estimated a significant correlation between prevalence of sever psoriasis and arthritis (P-value=0.000).

The nicotine stimulates dendritic cells, macrophages and keratinocytes. They release cytokines, mainly tumor necrosis factor-α (TNF-α), IL-6, activating the T-cells and sustaining the course of chronic psoriasis [33]. Interleukin-6, in turn, helps to increase the production of C-reactive protein (CPR) in liver, which can lead to systemic inflammation [33] and contribute to the onset of metabolic disorders. Fortes et al., 2005 [34] concluded that smoking is associated with the clinical severity of psoriasis and highlights the importance of smoking cessation in patients with psoriasis which agreed our results.

CONCLUSION:

We can conclude our study as the prevalence of psoriasis was higher among females. The mean age of our cases was 31.4 years. Our study depends on the PASI score to recognize the severe cases of psoriasis where we classify them according to it. If the PASI score was higher than 10 the case was classified as severe psoriasis. Smoking and arthritis were important risk factors for developing severe psoriasis.

RECOMMENDATIONS:

1. Assess severity of the disease by the dermatologist to facilitate appropriate referral, treatment planning and measurement of outcomes
2. Risk factor screening to decrease the prevalence of disease and it will decrease complication by early intervention.
3. Awareness campaign should be held to increase the perception of the psoriasis patients of how to deal with the disease and the dietary recommendation to decrease the disease severity.

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