Comparison of Early and Late Onset Psoriasis (EOP and LOP) Regarding Systemic Inflammatory Comorbidities: LOP is a More Rapid Subtype of Psoriasis

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ABSTRACT

Introduction: Early onset psoriasis (EOP) and late onset psoriasis (LOP) differ regarding genetic background, clinical presentation and course of disease.

Objectives: In this study, comparison of EOP and LOP regarding systemic inflammatory comorbidities which are frequently seen in psoriasis and determination of possible differences is aimed.

Methods: A total of 160 plaque psoriasis patients (121 with EOP and 39 with LOP) were enrolled for the study. Data was collected with face-to-face questionnaire and patients medical chart evaluation. Collected data included medical and family history, clinical features and parameters indicating severity of psoriasis, results of laboratory work-up, physical and dermatological examination findings, presence of joint and nail involvement and associated inflammatory systemic comorbidities such as cardiovascular diseases (CVD), diabetes mellitus (DM), hypertension (HT), metabolic syndrome (MS), obesity.

Results: Nail involvement and PsA occurred more rapidly in LOP compared to EOP (P < 0.01, P < 0.01). Compared frequencies in LOP and EOP were 7.7% versus 0.8% for CVD, 38.5% versus 14% for HT, 33.3% versus 9.9% for DM and 44.7% versus 24.8% for MS, respectively. CVD, HT, DM and MS were significantly more frequent in LOP compared to EOP (P = 0.045, P = 0.001, P < 0.01, P = 0.022). Results of multivariate analysis performed taking into account the age, gender, severity parameters of disease, alcohol consumption, smoking habits and other concurrent systemic comorbidities revealed LOP to be an independent risk factor for CVD and DM (P < 0.01, R^2: 0.036, P < 0.01, R^2: 0.077).

Conclusions: LOP seems to interact with systemic comorbidities hence generates more severe inflammatory burden and shows a more rapid course.

Introduction

Psoriasis is a chronic, multifactorial inflammatory skin disease with a polygenic background and variable clinical presentations. Nowadays, it is more frequently referred as "psoriatic disease" due to its association with systemic comorbidities such as psoriatic arthritis (PsA), obesity (OB), cardiovascular diseases (CVD), diabetes mellitus (DM), hypertension (HT), metabolic syndrome (MS) and inflammatory bowel diseases (IBD).

Psoriasis is classified based upon phenotypic presentation, association with human leukocyte antigen (HLA) and age at onset [1]. Henseler and Christophers have observed that clinical characteristics of psoriasis differ according to the age of onset [2]. In patients who developed psoriasis before age 40, psoriasis tends to be more severe, recurrent and resistant to treatment. Thus, they offered new classification of psoriasis based upon the age of onset; psoriasis which developed before 40 years was accepted as early onset psoriasis (EOP) and psoriasis which developed after 40 years as late onset psoriasis (LOP). Although this cut-off point have been used by several authors, others have used a wide range of cut-off point (30-50 years), thus limiting comparisons between studies [1,3–6].

Differences in the clinical characteristics and course of the disease, response to treatment, genetic predisposition and psychosocial effects in EOP and LOP have been reported in previous studies. EOP have been shown to be more severe and pose recurrent flares, positive family history, Koebner phenomenon and association with HLA-C [3–5,7–9]. EOP was also claimed to have more prominent psychosocial effect and requirement for systemic treatment is usually more frequent [1,7,10]. Epidemiologic studies have demonstrated association of psoriasis with systemic inflammatory diseases, but to our knowledge there is only one report comparing EOP and LOP regarding concomitant systemic inflammatory comorbidities, which found OB to be more frequent in LOP than EOP [1].

Objectives

Based on previous literature and lack of data in this aspect, we aimed to compare inflammatory comorbidities along with clinical characteristics and severity of psoriatic disease and possibly determine differences in EOP and LOP in this study.

Methods

Patients

Data was collected by a face-to-face questionnaire and medical chart evaluation. Patients older than 18 years of age with plaque psoriasis who were on follow-up at our department of dermatology between 1st October 2018 and 1st March 2019 were enrolled for the study. Patients with disease onset before age of 40 years were accepted as EOP and patients with disease onset equal or after 40 years were considered to have LOP. The study was approved by the ethic committee of non-invasive clinical studies of Hacettepe University (ID GO 18/1057-30).

Methods

Questionnaire

The face-to-face questionnaire consisted of 5 main sections: (1) patient demographics; (2) psoriasis characteristics; (3) concurrent comorbidities; (4) physical and dermatological examination; (5) laboratory studies.

Patient demographics

Age, gender, place of birth, place of residence was recorded.

Psoriasis characteristics

Age of onset of the disease, existence of nail involvement, age at the onset of nail involvement, type of nail involvement, existence of concomitant PsA, age at the onset of PsA, family history of psoriasis and PsA and age at the onset of psoriasis and PsA of the family member, received treatment regimens and duration of the treatment were recorded. Duration of active psoriatic disease was also required to be evaluated. To make this assessment; active psoriatic disease was defined as existence of cutaneous psoriatic lesions affecting more than 3% of body surface area with or without given treatments and was calculated for each patient. Hospitalizations due to psoriasis and any existed erythroderma attacks were also recorded. Existent or previous psoriatic nail involvement including onycholysis, pitting, subungual hyperkeratosis and oil-drop sign were questioned in detail and recorded. Joint involvement was questioned based on the previous diagnosis of PsA established by a rheumatologist. All patients were also filled out rheumatologic screening questionnaire (RSQ) regarding existence of PsA. RSQ included 5 items: (I) existence of joint and muscle pain at rest, (II) existence of neck, waist or back pain awakening at nights, (III) existence of pain, edema and tenderness in hands or feet joint, (IV) history of morning stiffness lasting for more than 20 minutes, and (V) existence of tenderness while stepping on heels in the mornings [11]. Patients were also consulted to rheumatology department based on the suspicion of PsA according to RSQ (patients with one or more positive answers to 5 items were consulted) and consultation results were added to the study data.

Concurrent comorbidities

Any previous diagnosis of concurrent systemic inflammatory comorbidities comprising HT, DM, NASH, CVD, DLP, MS,

OB was noted. Patients who had physical examination and/or laboratory findings indicative of definite disease according to below mentioned criteria despite lack of previous diagnosis, they were referred to concordant specialist for further evaluation, the results of this consultations were also added to this study data. HT was accepted as having systolic blood pressure ≥ 150 mmHg and diastolic blood pressure ≥ 90 mmHg in patients ≥ 60 years and systolic blood pressure ≥ 140 mmHg and diastolic blood pressure ≥ 90 mmHg in patients < 60 years [12]. Fasting blood glucose ≥ 126 mg/dl and random blood glucose ≥ 200 mg/dl was accepted as DM [13]. DLP was defined as total cholesterol levels > 200 mg/dl, LDL cholesterol > 100 mg/dl, HDL cholesterol < 40 mg/dl, TG >150 mg/dl and non-HDL cholesterol > 130 mg/dl, as proposed by American Endocrinology Association [14]. MS was accepted as having any three of the following five criteria: 1. obesity: waist circumference ≥ 102 cm in men and ≥ 88 cm in women; 2. dyslipidemia: TG > 150 mg/dl or having pharmacologic treatment (Rx); 3. dyslipidemia (second, separate criteria): HDL cholesterol < 40 mg/dl in men and HDL cholesterol < 35 mg/dl in women or Rx; 4. HT: systolic blood pressure ≥ 130 mmHg and diastolic blood pressure ≥ 85, or Rx; 5.hyperglycemia fasting blood glucose ≥ 100 mg/dl or Rx [15]. CVD included history of MI, coronary artery by-pass surgery, balloon angioplasty or coronary artery stent, cerebrovascular accident or peripheral atherosclerotic vascular disease. OB was defined BMI ≥ 30 [16].

Physical and dermatologic examination

Physical and dermatological examination findings obtained during examination in the last 6 months were noted. Physical examination findings included blood pressure, height, weight and waist circumference. Obtained dermatologic examination results comprised PASI score and affected body surface area (BSA). The severity of psoriasis was classified as mild (BSA ≤ 10; PASI ≤ 10) or moderate-to-severe (BSA > 10 and PASI > 10). Systemic treatment regimen, duration of systemic treatment, duration of active disease (both under treatment and without any treatment), number of erythroderma attacks and hospitalization due to psoriasis were also collected to assess the severity of psoriasis.

Laboratory studies

Obtained laboratory test results conducted during the last 6 months including complete blood count, fasting blood glucose, C-reactive protein (CRP), total cholesterol (TC), high density lipoprotein cholesterol (HDL), low density lipoprotein cholesterol (LDL), triglycerides (TG), blood urea nitrogen (BUN) were recorded.

Statistical Analysis

Statistical analysis was performed using Statistical Package for the Social Science (SPSS) version 20.0. Patient group data were presented as mean ± standard deviation (SD) or median (range), as appropriate and compared with adjustments using Fisher exact tests (for categorical variables) and Student two-sample t tests or Wilcoxon rank-sum tests (for continuous variables), subject to normality assumptions being satisfied. Associations between the age at the time of diagnosis and binary comorbidity outcomes were evaluated using multiple logistic regression adjusted for age and other relevant confounders.

Results

Demographic Data and Disease Characteristics in EOP and LOP

Data of 160 patients; 75.62% (N = 121) with EOP and 24.38% (N = 39) with LOP was analyzed and shown in Table 1. Family history of psoriasis was more frequent in EOP significantly. Family history of psoriasis was most frequently positive in the first-degree relatives in EOP and LOP: 23.1%, N = 28 and 10.3%, N = 4, respectively.

Assessment of Severity of Psoriasis in EOP and LOP

Severity of psoriasis was accessed depending on BSA percentage, PASI score, active duration of the disease without any treatment and under treatment, history of hospitalizations due to psoriasis and number of erythroderma attacks and no statistically significant difference was found in any parameters between EOP and LOP (Table 2).

Physical Examination Findings in EOP and LOP

Physical examination findings in EOP and LOP are shown in Table 3. Indicative findings of comorbidities such as HT and OB, eg systolic and diastolic blood pressure and BMI were significantly higher in LOP than EOP statistically (P = 0.005, P = 0.047 and P = 0.020).

Laboratory Studies in EOP and LOP

Laboratory work-up findings of the patients are shown in Table 4. Parameters indicating increased systemic inflammation, eg Red Cell Distribution Width (RDW), C-Reactive Protein (CRP) and Erythrocyte Sedimentation Rate (ESR) were statistically higher in LOP than in EOP respectively (P = 0.017, P = 0.006, P = 0.001). Fasting blood glucose was also higher in LOP (P = 0.002).

Systemic Treatments in EOP and LOP

Duration of systemic treatment was 42.09 ± 44.41 months in all patients, 44.41 ± 45.76 in EOP and 34.91 ± 39.65 months in LOP showing no significant difference (P = 0.158).

Table 1. Demographics and family history of psoriasis in EOP and LOP

Variables	Total patients (N = 160)	EOP (N = 121)	LOP (N = 39)	P
Gender				
male, N (%)	90 (56.3)	72 (59.5)	18 (46.2)	0.144
female, N (%)	70 (43.8)	40 (40.5)	21 (53.8)	
Age, years,	44.73 ± 13.66	40.46 ±12.24	57.95±8.40	
mean±SD (range)	(18-75)	(18-65)	(41-75)	<0.01
Age at onset of psoriasis, years,	27.24±15.06	20.07±8.45	49.49±7.20	
mean±SD (range)	(4-67)	(4-38)	(41-67)	<0.01
Family history of psoriasis, N (%)	64 (40)	57 (47.1)	7 (17.9)	0.001

EOP = early onset psoriasis; LOP = late onset psoriasis; SD = standard deviation.

Table 2. Comparison of disease severity in EOP and LOP

Variables	Total patients (N = 160)	EOP (N = 121)	LOP (N = 39)	P
BSA, %	3.50 ± 8.65	3.34 ± 8.58	3.99 ± 8.96	
mean±SD (range)	(0-74.5)	(0.1-74.7)	(0-37.8)	0.636
PASI	3.46 ± 6.42	3.16 ± 6.07	4.37 ± 7.43	
mean±SD (range)	(0-53.10)	(0.2-53.10)	(0-36)	0.460
Active disease without Rx, months	24.46 ± 49.59	28.62 ± 55.26	11.54 ± 20.57	
mean±SD (range)	(0-360)	(0-360)	(0-96)	0.083
Active disease with Rx, months	28.29 ± 68.68	33.78 ± 77.57	11.26 ± 18.32	
mean±SD (range)	(0-492)	(0-492)	(0-72)	0.334
History of hospitalization				
Number of positive history, N (%)	28 (17.5)	24 (19.8)	4 (10.3)	0.171
Number of hospitalizations	0.38 ± 1.25	0.35 ± 0.90	0.49 ± 1.99	
mean±SD (range)	(0-12)	(0-5)	(0-12)	0.380
History of erythroderma				
number of positive history, N (%)	12 (7.5)	11 (9.1)	1 (2.6)	0.296
Number of erythroderma	0.13 ± 0.55	0.16 ± 0.61	0.05 ± 0.32	
mean±SD (range)	(0-5)	(0-5)	(0-2)	0.187

BSA = body surface area; EOP = early onset psoriasis; LOP = late onset psoriasis; PASI = psoriasis area and severity index; Rx = systemic treatment; SD = standard deviation.

Table 3. Physical examination findings in EOP and LOP

Variables	Total patients (N = 160)	EOP (N = 121)	LOP (N = 39)	P
Systolic BP, mm/Hg	118.17 ± 13.39	116.24 ± 12.46	124.18 ± 14.55	
mean±SD (range)	(90-160)	(90-150)	(100-160)	0.005
Diastolic BP, mm/Hg	79.31 ± 10.94	78.14 ± 10.02	82.95 ± 12.86	
mean±SD (range)	(50-120)	(50-100)	(60-120)	0.047
BMI, kg/m^2	28.02 ± 4.93	27.62 ± 5.16	29.27 ± 3.94	
mean±SD (range)	(16.67-46.90)	(16.67-46.90)	(21.39-39.40)	0.020
Waist circumference/men, cm	102.07 ±13.55	101.13 ±13.97	105.83 ±11.31	
mean±SD (range)	(76-143)	(76-143)	(79-129)	0.190
Waist circumference/women, cm	99.80 ± 13.29	98.67 ±14.62	102.42 ± 9.29	
mean±SD (range)	(76-149)	(76-149)	(84-127)	0.282

BMI = body mass index; BP = blood pressure; EOP = early onset psoriasis; LOP = late onset psoriasis; SD = standard deviation.

Table 4. Laboratory findings in EOP and LOP

Variables	Total patients (N = 160)	EOP (N = 121)	LOP (N = 39)	P
Hemoglobin, gr/dL	14.71 ± 1.46	14.85 ± 1.43	14.28 ± 1.48	
mean±SD (range)	(9.6-17.6)	(9.6-17.6)	(11.0-17.2)	0.035
WBC, x10³/μL	7069 ± 1716.37	6973 ±1701.75	7364 ± 1750.11	
mean±SD (range)	(3800-13400)	(3900-11800)	(3800-13400)	0.222
Platelets, x10³/μL	230597±60028.87	227699 ±58982.59	239589 ± 63101.30	
mean±SD (range)	(24600-424000)	(24600-381000)	(137000-424000)	0.283
RDW, %	13.99±1.64	13.84 ± 1.33	14.46 ± 2.34	
mean±SD (range)	(12-27)	(12-20.1)	(12.5-27.1)	0.017
Fasting blood glucose, mg/dL	97.75 ± 25.77	94.84 ± 22.37	106.65 ± 32.92	
mean±SD (range)	(68-260)	(68-203)	(77-260)	0.002
CRP, mg/L	0.52 ± 0.81	0.45 ± 0.59	0.76 ± 1.28	
mean±SD (range)	(0.02-7.90)	(0.02-5.59)	(0.15-7.99)	0.006
ESR, mm/hour	11.61 ± 9.52	10.30 ± 8.58	16.56 ± 11.30	
mean±SD (range)	(2-54)	(2-37)	(2-54)	0.001

CRP = C-reactive protein; EOP = early onset psoriasis; ESR = erythrocyte sedimentation rate; LOP = late onset psoriasis; MCV = mean corpuscular volume; MPV = mean platelet volume; NLR = neutrophil lymphocyte ratio; RDW = red cell distribution width; SD = standard deviation; WBC = white blood cells.

Nail Involvement in EOP and LOP

Psoriatic nail involvement was compared in EOP and LOP, and results are shown in Table 5. The duration of disease between onset of psoriasis and nail involvement was statistically significantly shorter in LOP than EOP (P < 0.01). Duration of active psoriatic disease in patients with nail involvement was also significantly shorter in LOP than in EOP (P < 0.01, P < 0.01).

The most frequent psoriatic nail involvement was seen as pitting, observed in 14% (N = 17) of EOP and 12.8% (N = 5) in LOP. Subungual hyperkeratosis was only observed in 5% (N = 6) of EOP, distal onycholysis was observed in 5% (N = 6) and 10.3% (N = 4), oil-drop sign was observed in 5% (N = 6) and 2.3 % (N = 1) of EOP and LOP, respectively.

PsA in EOP and LOP

Data regarding prevalence of PsA, age at onset of PsA, duration between onset of psoriasis and PsA, and active disease duration of patients with PsA with and without treatment are shown in Table 6. Duration between onset of psoriasis and PsA was significantly shorter in LOP than EOP (P < 0.01). Duration of active disease in PsA patients with or without systemic treatments was also significantly shorter in LOP than EOP respectively (P = 0.002, P < 0.01).

RSQ revealed morning stiffness in 10.7% (N = 13) of EOP and 5.1 % (N = 2) of LOP. Muscle-joint complaints was observed in 9.1% (N = 11) and 10.3% (N = 4), small joints complaints were found in 9.1% (N = 11) and 5.1% (N = 2), enthesis complaints were found in 14% (N = 17) and 12.8% (N = 5) and axial complaints were noted in 14.9 % (N = 18)

and 20.5% (N = 8) of EOP and LOP patients respectively. None of the patients referred to rheumatologic consultations were diagnosed with PsA.

Concurrent Systemic Inflammatory Comorbidities in EOP and LOP

Prevalence and age at onset of systemic inflammatory comorbidities in EOP and LOP are shown in Table 7. CVD, HT, DM and MS were found significantly more frequent in LOP compared to EOP (P = 0.045, P = 0.001, P < 0.01, P = 0.022).

In order to evaluate the effect of psoriasis subtype to the development of concurrent systemic inflammatory comorbidities, multivariate regression analysis was performed; age, gender, severity parameters of disease, alcohol consumption, smoking habits and other concurrent systemic comorbidities were taken into account (Table 8). Based on this analysis, LOP was found as an independent risk factor for CVD and DM (P < 0.01, R^2: 0.036; P < 0.01, R^2: 0.077).

Risk of CVD, DM, HT and MS were increased accordingly with decades of psoriasis onset (P = 0.036, P = 0.007, P = 0.001, P = 0.003). NASH, DLP and OB development risk was not found to be showing this relationship with psoriasis onset (P = 0.194, P = 0.158, P = 0.644).

Conclusions

As it was aimed, comparison of disease characteristics and concurrent inflammatory comorbidities enabled us to spot the peculiar differences in EOP and LOP; we were also able

Table 5. Psoriatic nail involvement in EOP and LOP

Variables	Total patients (N = 160)	EOP (N = 121)	LOP (n = 39)	P
Nail involvement, n (%)	87 (54.3)	68 (56.1)	19 (48.7)	0.415
Age at nail involvement onset, years	34.29 ± 12.93	29.51 ± 10.23	49.85 ± 7.33	
mean±SD (range)	(10-70)	(10-62)	(37-70)	< 0.01
Disease duration between Ps and nail involvement, years	7.4 ± 8.1	9.06 ± 8.5	2.1 ± 3.0	- [a], < 0.01 [b]
mean±SD (range)	(4-37)	(0-37)	(4-9)	
Concurrent nail involvement and PsA, N (%)	28 (17.5)	8 (6.6)	5 (12.8)	0.072 [a], 0.041 [b]
Active disease duration in patients with nail involvement and Rx, months	30.63 ± 9.1	35 ± 48.32	16 ± 19.3	0.639 [a], < 0.01 [b]
mean±SD				
Active disease duration in patients with nail involvement without Rx, months	30.22 ± 9.8	34 ± 50.1	17 ± 18.2	0.027 [a], < 0.01 [b]
mean±SD				

EOP = early onset psoriasis; LOP = late onset psoriasis; Ps = psoriasis; PsA = psoriatic arthritis; Rx = systemic treatment; SD = standard deviation. P [a]: patients with psoriasis; P[b]: between EOP and LOP

Table 6. PsA characteristics in EOP and LOP

Variables	Total patients (N = 160)	EOP (N = 121)	LOP (N = 39)	P
PsA, N (%)	41 (25.6)	33 (27.3)	8 (20.5)	0.057
Age at PsA onset, years	38.98 ± 11.64	37.0 ± 11.49	47.13 ± 8.77	
mean±SD (range)	(10-71)	(10-63)	(37-71)	0.025
Duration between Ps and PsA, years	12.80 ± 11.46	15.72 ± 10.36	0.75 ± 7.36	-[a], < 0,01[b]
mean±SD (range)	(15-34)	(1-34)	(1-15)	
Active Ps duration in PsA patients with Rx, months	28.34 ± 9.2	34 ± 20.1	6 ± 8.3	0.761 [a], 0.002 [b]
mean±SD				
Active Ps duration in PsA patients without Rx, months	27.98 ± 10.3	33 ± 15.1	9 ± 18.1	0.803 [a], < 0.0 [b]
mean±SD				

EOP = early onset psoriasis; LOP = late onset psoriasis; Ps = psoriasis; PsA = psoriatic arthritis; Rx = systemic treatment; SD = standard deviation. P[a]: patients with psoriasis; P[b]: between EOP and LOP

to evaluate the sole contribution of psoriasis subtype (LOP) to the developmental risk of certain comorbidities determined as CVD and DM.

Psoriasis is proven to cause serious systemic inflammation however the exact tools to monitor the inflammatory burden is yet to be discovered. Reports in literature concerning the severity of psoriasis subtypes comparing EOP and LOP are few and contradictory. In these data, authors mostly used PASI score, BSA and duration of systemic treatment to evaluate severity of psoriasis. Although some researches did not find significant difference in the severity of psoriasis between EOP and LOP , others found EOP to be more severe than LOP [1,3,4,7,17]. In this study, evaluation of psoriatic inflammation was assessed by severity parameters

along with calculations made for active disease duration and duration of time between onset of psoriasis and concurrent inflammatory comorbidities. Although traditional markers of psoriasis severity such as PASI scores and BSA did not show any difference between EOP and LOP, we found that LOP was associated with rapid development of psoriatic nail involvement and PsA in statistically significantly shorter periods of time despite shorter active disease durations with and without treatment. LOP was also found to associate with higher levels of inflammatory serum markers like CRP, ESR and RDW. As a whole, our results strongly support that LOP poses heavier and rapid inflammatory burden. Accordingly, we prioritize the determination of the disease subtype as EOP or LOP and suggest exploring the duration of time between

Table 7. Prevalence and age at onset of psoriatic comorbidities in EOP and LOP

Variables	Total patients (N = 160)	EOP (N = 121)	LOP (N = 39)	P
CVD, N (%)	4 (2.5)	1 (0.8)	3 (7.7)	0.045
Age at CVD onset, years	50.75 ± 2.36	51	50.67 ± 1.67	0.929
mean±SD (range)	(49-54)	51	(49 -54)	
HT, n (%)	32 (20)	17 (14)	15 (38.5)	0.001
Age at HT onset, years	44.28 ± 8.23	41.53 ± 5.37	47.40 ± 9.87	
mean±SD (range)	(33-70)	(33-53)	(39-70)	0.165
DM, N (%)	25 (15.6)	12 (9.9)	13 (33.3)	< 0.01
Age at DM onset, years	42.68 ± 9.79	37.75 ± 7.70	47.23 ± 9.53	0.004
mean±SD (range)	(28-65)	(28-57)	(38-65)	
NASH, N (%)	29 (18.1)	22 (18.2)	7 (17.9)	0.974
Age at NASH onset, years	39.21 ± 8.20	37.48 ± 8.34	44.43 ± 5.38	0.045
mean±SD (range)	(20-59)	(20-59)	(38-53)	
DLP, N (%)	99 (61.9)	72 (59.5)	27 (69.2)	0.392
MS, N (%)	47 (29.6)	30 (24.8)	17 (44.7)	0.022
OB, N (%)	46 (28.7)	36 (29.8)	10 (25.6)	0.622

CVD = cardiovascular disease; DLP = dyslipidemia; DM = diabetes mellitus; EOP: early onset psoriasis; HT = hypertension; LOP = late onset psoriasis; MS = metabolic syndrome; NASH = non-alcoholic steatohepatitis; OB = obesity; SD = standard deviation.

Table 8. Multivariate regression analysis of impact of psoriasis subtype on concurrent systemic inflammatory comorbidities

	HT	DM	IBD	NASH	CVD	DLP	MS	OB	Rx duration	Disease duration
HT	-	0.158	-	-	-	-0.249	0.225	0.177	-	-
DM	-	-	-	0.167	-	-	0.235	-	-	-
IBD	-	-	-	-	-	-	-	-	0.217	-
NASH	-	-	-	-	-	-	-	0.219	0.249	-
CVD	-	-	-	-	-	-	-	-	-	-
DLP	-0.231	-	-	-	-	-	0.557	-	-0.194	-
MS	0.402	0.309	-	-	-	0.632	-	-	-	-
OB	-	-	-	0.220	-	-	-	-	-	-
PASI	-	-	-	-	-	-	-	-	-	-
BSA	-	-	-	-	-	-	-	-	-	-
Ps subtype	-	0.168	-	-	0.248	-	-	-	-	-0.747
Gender	-	-	-	-0.265	-0.163	-	-	0.182	-	0.101
Duration of Rx	-	-	0.236	0.250	-	-	-	-	-	-
Age	0.403	-	-	-	-	0.224	-	-	1.009	0.663
Disease duration	-	-	-	-	-	-	-	-	-0.516	-
Duration of active disease without Rx.	-	-	-	-	-	-	-	-	-	0.156
Duration of active disease with Rx	-	-	-	-	-	-	0.123	-	-	0.188
Smoking	-	-	-	-	-	-	-	-	-	-
R² Value	0.288	0.237	0.056	0.200	0.133	0.451	0.538	0.115	0.325	0.620
P Value	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000

BSA = body surface area; CVD = cardiovascular disease; DLP = dyslipidemia; DM = diabetes mellitus; HT = hypertension; IBD = inflammatory bowel disease; MS = metabolic syndrome; NASH = nonalcoholic steatohepatitis; OB = obesity; PASI = psoriasis area and severity index; Ps = psoriasis; Rx = systemic treatment.

onset of psoriatic involvements and comorbidities (psoriatic nail, PsA, CVD, DM, HT, MS) and active disease duration for evaluating inflammation and its consequences in psoriasis. We believe that the all- together analysis of these parameters with the traditional clinical severity scores may create a new concept of approach for psoriasis follow-up.

Nail involvement is observed in 13%-50% of psoriasis patients and this rate increases to 80%-90% by age [18]. Reports on nail involvement in EOP and LOP differ; some report more frequent nail involvement in EOP, others found that LOP more frequently affect nails [3,5,10,17]. There are also studies showing no difference in nail involvement between EOP and LOP [1,4,7]. We did not observe statistically significant difference in both nail involvement and type of nail involvement, neither. But interestingly, nails were found to be affected in significantly shorter duration in LOP in comparison with EOP. Similar to the findings observed in psoriatic nail involvement, PsA was found to develop in significant shorter periods of time in EOP. Generally, PsA is observed in 5-30% of patients with psoriasis [19]. Most researches did not find difference in concurrent PsA between EOP and LOP [3,4,7]. Heredi et al have demonstrated that the PsA was more frequent in EOP and risk of development of PsA decreases by increasing age and this risk completely disappears after age 75 [1]. In this study, there was no difference between EOP and LOP for associating PsA prevalence. RSQ responses were also similar in two disease subtypes. As it leads to PsA faster than EOP, LOP can be accepted to generate a rapid inflammatory course and cause damage target organs such as nails, ligaments, tendons and joints.

Increased frequencies of systemic comorbidities such as CVD, DM, HT and MS in LOP compared to EOP were detected in this study. BMI, systolic and diastolic blood pressure values, fasting blood glucose, BUN, CRP, ESR, RDW levels were also higher in LOP. These findings suggest that concomitant inflammatory comorbidities may increase the amount and speed of psoriatic inflammation. To our knowledge there are no reports comparing the laboratory indicatives of systemic inflammation in EOP and LOP, but these parameters have been shown to be higher in psoriasis patients in comparison to general population [20,21]. RDW and CRP levels have also been suggested as reliable markers of inflammation in psoriasis [20,21]. Besides, elevated levels of CRP have been shown to be an independent risk factor for development of CVD in psoriasis and may be associated with increased risk of MS [21]. However, there is again few data of psoriasis subtype and its contribution to these concurrent comorbidities. Heredi et al did not found difference in the risk of development of CVD between EOP and LOP [1]. Despite our low number of cases in the study, LOP was able to be shown as an independent risk factor for CVD and DM. This risk must be kept in mind in LOP and on time referral and adequate anti-psoriatic treatment choice is mandatory and is lately recommended in psoriasis guidelines [22].

EOP and LOP are two different types of psoriasis with different etiologies, clinical characteristics, laboratory indicatives and concurrent systemic comorbidities. Despite similar treatment regimens and shorter duration of active disease, LOP causes faster nail and joint involvement in a shorter period of time and is more frequently associated with systemic inflammatory comorbidities such as CVD, DM, HT and MS. LOP was also found to be independent risk factor for development of CVD and DM. From this aspect, we prioritize the determination of the disease subtype as EOP or LOP and suggest LOP to be closely monitored for potential development of end-organ inflammatory comorbidities. LOP must be considered as the more rapid and aggressive type of psoriasis which provokes development of inflammatory comorbidities in shorter duration in comparison to EOP.

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