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RESEARCH ARTICLE

DERMOSCOPIC FEATURES OF NAIL PSORIASIS AND CORRELATION WITH DISEASE SEVERITY

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Abstract

Background / Objectives: Dermoscopy is a non-invasive technique that has been recognized recently as an effective tool in the diagnosis of nail diseases, including nail psoriasis. The aim of this study was to clarify specific dermoscopic features of nail psoriasis and identify those that are correlated with disease severity.

Methods: We conducted a prospective study over 18 months. Fifty patients followed for psoriasis and nail involvement were enrolled. Following a clinical examination, the patients were classified according to the “Nail Psoriasis Severity Index” (NAPSI) and the “Psoriasis Area and Severity Index” (PASI). A dermoscopic examination of all fingernails was performed, including the nail plate, periungual folds, subungual area, cuticule and hyponychium.

Results: The most frequently observed dermoscopic features were distal onycholysis (90%), subungual hyperkeratosis (80%), splinter haemorrhage (72%), paronychia and mottled lunula (62%), followed by dilated capillaries in the hyponychium (50%), pitting (48%), trachyonychia (42%), erythematous border of an onycholytic area (40%) and leukonychia (32%). Statistically significant relationships were observed between the severity of psoriasis, as determined using PASI, and the presence of pachyonychia, pitting, distal onycholysis, paronychia, onychomadesis as well as the presence of red lunula, mottled lunula, dilated capillaries of the hyponychium and crumbling. As well, pachyonychia, paronychia, splinter haemorrhage, onychomadesis, mottled lunula, trachyonychia and crumbling were relevant to nail psoriasis severity.

Conclusions: Dermoscopy can improve the accuracy of nail psoriasis diagnostic. We have demonstrated positive associations between a number of dermoscopic manifestations and disease severity.

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Introduction:-

Nail involvement in psoriasis is common. Its prevalence among patients with psoriasis is up to 50%[1,2],and in patients with psoriatic arthritis is 80-90%[3,4],with 5-10%[5,6] of them having isolated nail affection, which makes the diagnosis difficult. Although histopathology is the gold standard of the diagnosis, nail biopsy is painful. Onychoscopy is a non-invasive tool that contributes to the diagnosis of psoriasis when the clinical manifestations are

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not typical. It also allows the identification of subclinical lesions or the elimination of differential diagnoses of other onychopathies[7,8].

The aim of this study was to investigate specific dermoscopic features of nail psoriasis (NP) and to determinate the association between these features and disease severity.

Patients and Methods:-

Criteria for inclusion/exclusion:

A total of 50 patients were prospectively enrolled over a period of 18 months. Among them, 42 had skin psoriasis and clinically detectable nail involvement and 8 patients had isolated nail involvement. For all patients, the diagnosis of nail psoriasis was based upon their psoriatic history and the presence of psoriatic nail lesions and negative fungal results. Histopathological confirmation was needed in 5 cases only.

Dermoscopy and history collection:

For each patient, a detailed history was recorded including age, sex, age onset, disease duration, subtype of psoriasis and the association with psoriatic arthritis or scalp involvement. All fingernails were examined by handheld dermatoscope(Dermlite DL4; 3Gen). Imagesof every involved fingernail were recorded by the digital camera ofa mobile phone attached to the dermatoscope. We performed a dermoscopic evaluation of the nail plate surface, periungual folds, subungual area, cuticule and hyponychium. Following a clinical examination, patients were classified according to the Nail Psoriasis Severity Index (NAPSI) which was originally described by Rich et al.[9]and the "Psoriasis Area and Severity Index" (PASI).

Statistical analysis:

The statistical analysis was performed using SPSS software version 20. A univariate analysis was performed to study the relationship between two variables. The comparison of the means of the variables was carried out using the parametric Student's T test or the ANOVA test. Linear regression was performed between two quantitative variables. The significance level is set at <0.05 and the confidence interval at 95%.

Results:

Basic characteristics:

A total of 50 patients, 22 (44%) men and 28 (56%) women, were included in the study. The average age was 43.96 yearsold (ranging from 16 to 68 years old) and the average age at onsetwas 36.16 years old.The duration of psoriasis ranged from 6 weeks to 30 years (average duration: 8 years).

Forty-two (84%) patients with psoriasis had both skin and nail involvement, and only 8 (16%) patients had NP only. The diagnosis was based solely on clinical and dermoscopicexamination and only 5 patients needed nail biopsy. The total number of fingernails with NP was 358. All patients with psoriasis had at least 3 affected fingernails and the average number of affected fingernails was 7.16.

Among the 50 patients, plaque psoriasis was the most common skin condition (64%), 12% had guttate psoriasis, 30% palmoplantar keratoderma, 62% with scalp involvement, 12% cases of arthropathic psoriasis, 4% of pustular psoriasis and 28% of erythroderma.

The PASI score ranged from 1.9 to 38.2 (average PASI: 16.96) and the NAPSI score from 6/80 to 76/80 (average NAPSI: 26.2/80) (Table 1).

Tables 1:- Demographic and clinical characteristics of nail psoriasis patients.

Variable		Results
Gender M:F		22:28
Age		Mean: 43.96 (range: 16-68 years)
Age at onset		Mean: 36.16
Duration of psoriasis		Mean: 8 years (range:6 week-30 years)
Clinical form of	Plaque psoriasis	64%
	Guttate psoriasis	12%

psoriasis	Palmoplantar keratoderma	30%
	Arthropathic psoriasis	12%
	Pustular psoriasis	4%
	Erythroderma	28%
	Scalp involvement	62%
PASI		Mean: 16.96 (range: 1.9-38.2)
NAPSI		Mean: 26.2/80 (range: 6-76)
Nail signs	**Nail matrix psoriasis**	
	Pitting	48%
	Leukonychia	32%
	Onychomadesis	14%
	Red lunula	10%
	Beau’s lines	20%
	Longitudinal ridges	16%
	Trachyonychia	42%
	Crumbling	28%
	Nail bed psoriasis	
	Distal onycholysis	90%
	Splinter hemorrhage	72%
	Erythematous border of an onycholytic area	40%
	Salmon patch	30%
	Dilated capillaries in hyponychium	50%
	Paronychia	62%
	Subungual hyperkeratosis	80%

Clinical and dermoscopic features:

NP affected both nail plate and nail bed (Figure 1). The most frequently found dermoscopic features were distal onycholysis (90%), subungual hyperkeratosis (80%), splinter haemorrhage (72%), paronychia and mottled lunula (62%), followed by dilated capillaries in the hyponychium (50%), pitting (48%), trachyonychia (42%), erythematous border of an onycholytic area (40%) and leukonychia (32%) (Figure 2).

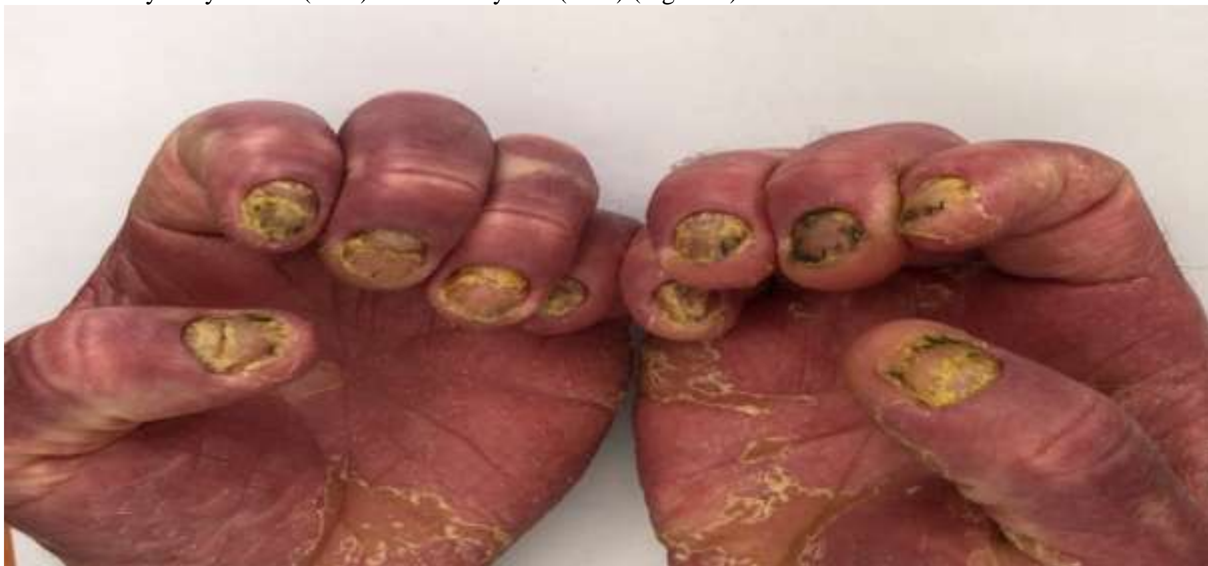

Figure 1:- Clinical presentation of nail psoriasis.

Another dermoscopic features noticed were salmon patches (30%), crumbling (28%), beau's lines (20%) and longitudinal ridges (16%) (Table 1) (Figure 2).

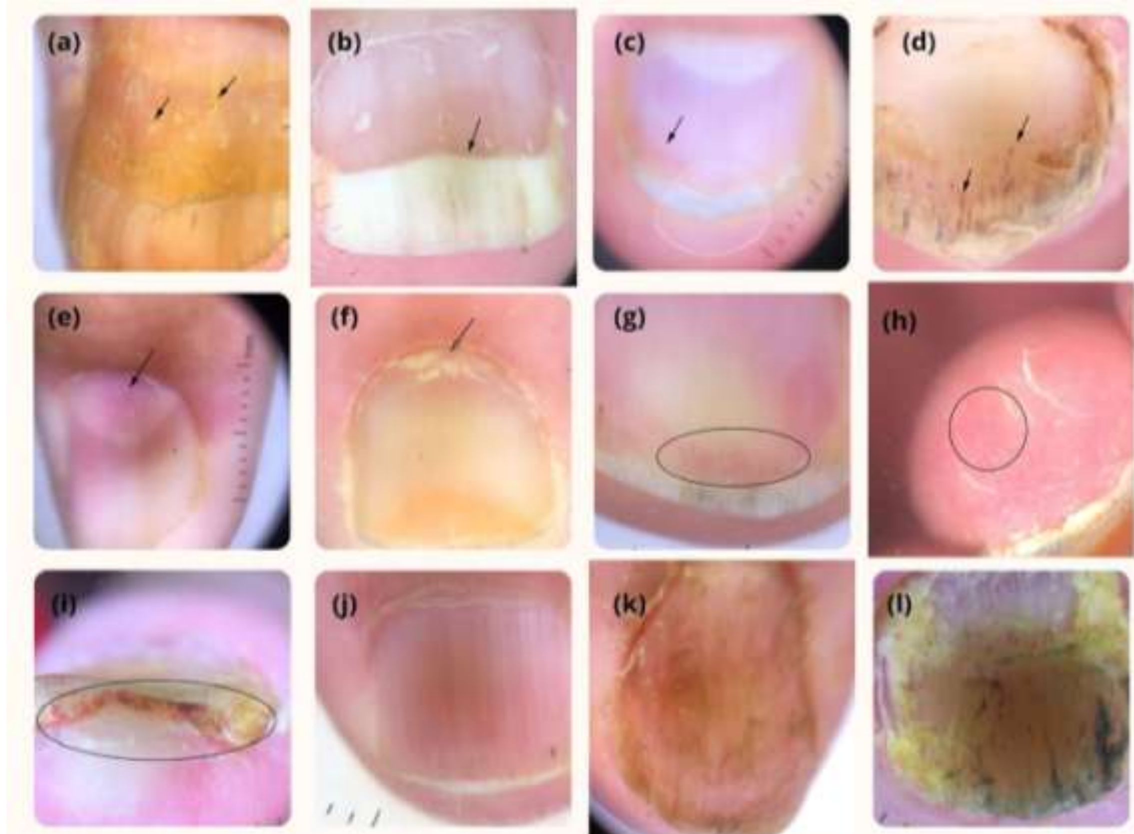

Figure 2:- Some dermoscopic signs of nail psoriasis.
a: pitting; b:distal onycholysis; c: salmon patch; d: splinter hemorrhage; e: red lunula; f: mottled lunula; g: erythematous border of an onycholytic area; h: dilated capillaries of the hyponychium; i: subungual hyperkeratosis; j: longitudinal ridges; k: trachyonychia; l: crumbling

Clinical parameters related to severity of nail psoriasis:
Linear regression models were used in order to explore the association between the severity of psoriasis PASI or nail psoriasis NAPSI and age, duration of psoriasis, age at onset and the number of nails affected. Only the age at onset reached statistical significance ($p<0.05$) (Table 2).Statistically significant relationships were observed between the severity of psoriasis, as determined using PASI, and the presence of pachyonychia ($p=0.022$), pitting ($p<0.001$), distal onycholysis ($p=0.049$), paronychia ($p<0.001$), onychomadesis ($p<0.001$) as well as the presence of red lunula ($p=0.002$), mottled lunula ($p=0.030$), dilated capillaries of the hyponychium ($p=0.012$) and crumbling ($p=0.011$) (Table 3).

Tables 2:- Association between PASI and NAPSI and age, duration of psoriasis, age at onset and number of affected nails.

	PASI		NAPSI	
	P value	**IC 95%**	**P value**	**IC 95%**
Age	0.164	[-0.36-0.06]	**0.005**	[0.15-0.80]
Duration of psoriasis	0.283	[-0.228-0.763]	**< 0.001**	[0.561-1.993]
Age at onset	**0.045**	[-0.436-0.005]	0.195	[-0.123-0.588]
Number of affected nails	0.443	[-0.95-2.13]	**0.001**	[5.65-8.49]

The age, the duration of psoriasis and the number ofaffected nails reached statistical significancewhen NAPSI score was used to reflect the severityof nail psoriasis (p<0.05) (Table 2). The patient with NP accompanied by certain dermoscopic features had significantly higher NAPSI than patients without the same features. The NP might become severe when these dermoscopic features were observed, including pachyonychia (p=0.007), paronychia (p=0.022), splinter haemorrhage (p<0.001), onychomadesis (p<0.001), mottled lunula (p=0.003), trachyonychia(p<0.001) and crumbling (p<0.001) (Table 3).

Tables 3:- Statistical analysis of the dermoscopic features with regard to PASI and NAPSI scores.

Variables	PASI				NAPSI			
	Mean (Standard deviation)		95% confidence interval	p value	**Mean (Standard deviation)**		95% confidence interval	p value
	yes	**no**			**yes**	**no**		
Pachyonychia	23.03 (14.20)	13.54 (11.64)	[1.46-17.52]	**0.022**	36.89 (25.49)	20.19 (16.23)	[4.84-28.55]	**0.007**
Pitting	10.29 (10.23)	23.11 (12.97)	[-19.45-6.20]	**<0.001**	22.79 (17.43)	29.35 (24.42)	[-18.57-5.46]	0.278
Distal onycholysis	15.73 (13.43)	28.02 (3.66)	[-24.52-0.52]	**0.049**	27.69 (22.03)	12.80 (4.38)	[-5.14-34.92]	0.142
Paronychia	21.65 (12.50)	9.31 (11.03)	[5.51-19.17]	**<0.001**	31.58 (23.63)	17.42 (13.58)	[2.18-26.14]	**0.022**
Leukonychia	12.85 (10.81)	18.89 (14.06)	[-14.05-1.95]	0.135	18.69 (9.75)	29.74 (24.42)	[-23.83-1.73]	0.089
Splinter hemorrhage	17.00 (13.95)	16.83 (11.78)	[-8.05-8.40]	0.965	32 (22.08)	9.69 (2.84)	[9.87-34.73]	**<0.001**
Onychomadesis	34.64 (3.68)	14.08 (12.00)	[11.29-29.82]	**<0.001**	50.29 (32.07)	22.28 (16.57)	[12.26-43.74]	**<0.001**
Red lunula	33.70 (4.10)	15.10 (12.66)	[7.05-30.14]	**0.002**	26.40 (14.24)	26.18 (22.16)	[-17.07-17.51]	0.976
Mottled lunula	20.12 (14.31)	11.80 (9.75)	[0.82-15.82]	**0.030**	33.03 (23.33)	15.05 (11.30)	[6.43-29.52]	**0.003**
Beau's lines	19.67 (15.76)	16.28 (12.75)	[-8.32-15.09]	0.541	23.80 (15.17)	26.80 (22.80)	[-15.50-9.50]	0.623
Erythematous border of an onycholytic area	16.22 (11.76)	17.45 (14.41)	[-9.03-6.55]	0.751	21.45 (15.66)	29.37 (24.22)	[-20.25-4.42]	0.203
Salmon patch	13.71 (13.37)	18.35 (13.22)	[-13.09-3.80]	0.269	28.27 (20.46)	25.31 (22.01)	[-10.43-16.34]	0.659
Dilated capillaries in hyponychium	21.59 (14.47)	12.33 (10.36)	[2.10-16.41]	**0.012**	30.72 (24.27)	21.68 (17.40)	[-3.00-21.08]	0.137
Subungual hyperkeratosis	18.62 (13.82)	10.33 (8.67)	[-9.59-17.53]	0.078	28.95 (22.17)	15.20 (13.95)	[-1.09-28.59]	0.069
Longitudinal ridges	9.75 (13.54)	18.34 (12.96)	[-20.24-3.00]	0.129	22.75 (12.78)	26.86 (22.72)	[-16.18-7.96]	0.483
Trachyonychia	16.72 (16.42)	17.13 (10.81)	[-8.14-7.34]	0.917	37.86 (22.56)	17.76 (16.18)	[8.37-31.81]	**<0.001**
Crumbling	27.98 (14.65)	13.95 (11.72)	[3.67-24.38]	**0.011**	51.09 (22.98)	19.28 (15.50)	[15.82-47.80]	**<0.001**

Discussion:-

To date, reports on dermoscopic features of nail psoriasis are limited[10-13]. Moreover, few studies have focused on disease severity related to dermoscopic parameters[14,15].

Signs of nail matrix involvement include pitting, trachyonychia, beau's line, leukonychia and mottled lunula, whereas signs of nail bed involvement include onycholysis, salmon patches, splinter hemorrhages and subungual hyperkeratosis[7,11,16]. Splinter hemorrhages are reddish-brown or purplish-black striae arranged in a longitudinal fashion, usually on distal parts of the nails, and they are a sign of capillary bleeding[17]. Salmon patches, also known as the oil drop sign, refer to the yellowish-red discolorations that appear as irregular translucent areas visible on the nail plate.

The use of dermoscopy enables subtle nail changes to be observed, this may influence the prevalence of observed nail signs, as reported in a few reports using dermoscopy[10,11,18]. According to the results of our study, distal onycholysis, subungual hyperkeratosis, splinter haemorrhage, paronychia, mottled lunula, dilated capillaries in the hyponychium and pitting were the most common dermoscopic features of NP, which agrees with the data in the literature[6,19].Yadav et al. reported pitting as the most common onychoscopic feature indicating nail matrix involvement, while splinter hemorrhages was the most common onychoscopic feature indicating nail bed involvement[10]. Nakamura et al. described onycholysis, splinter hemorrhages, subungual hyperkeratosis and salmon patches while Hashimoto et al. reported onycholysis, splinter hemorrhages and erythematous borders of an onycholytic area[16,20].

In our study, we found that patients with more severe nail psoriasis were more likely to: (1) be older; (2) have a longer duration of disease; and (3) have a larger number of affected nails. Age onset was not associated with disease severity. You et al. found similar results[21].

Yorulmaz et al. recruited 67 patients with NP and found that dilated capillaries, nail plate thickening and crumbling, subungual hyperkeratosis, transverse grooves, trachyonychia, pitting, and salmon patches were positively associated with the severity of NP[11].Our study was substantially consistent with the results of Yorulmaz et al.[11]; additionally, we demonstrated that pachyonychia, splinter haemorrhage and mottled lunula were relevant to the severity of NP, while subungualhyperkeratosis, pitting and salmon patches were not. Another studydemonstrated that red lunula, longitudinal fissures, and erythematous border of an onycholytic area were relevant to the severity of NP; what we could not demonstrate in our study[19].

In addition, Iorizzo et al. conducted a videodermoscopic evaluation to study capillary network of the hyponychium in patients with nail bed psoriasis and observed dilated and tortuous capillaries in all patients as well as a positive correlation between the capillary density and psoriasis severity[22]. In our study, dilated capillaries in the hyponychium were not correlated with NP severity.

Another study with a small sample identified dermoscopic markers that reflected systemic inflammatory activity, in which disappearance of diffuse scaling, transverse grooves, splinter hemorrhages and appearance of erythematous border of the onycholytic area were associated with improvement in PASI score[20]. In our study, the PASI score of the patients with pachyonychia, pitting, distal onycholysis, paronychia, onychomadesis, red lunula, mottled lunula, dilated capillaries of the hyponychium and crumbling were higher than those without these features.The dilatation of capillaries might result from the accumulation of several cytokines or the immune complex deposition in the vessel wall, whereas red lunula resulted from the increasing blood flow in the pathology[23,24]. The presence of these features might reflect theserious systemic inflammation.

Conclusion:-

Recognizing key dermoscopic features of nail psoriasis can optimize diagnostic accuracy, guide prognosis, minimize the need for unnecessary biopsies, and optimize treatment. Future studies should include larger sample sizes and control groups to further identify the specific dermoscopic manifestations of nail psoriasis and elucidate the association between each dermoscopic finding and disease severity.

Conflict of Interest Statement:
The authors have no conflicts of interest to declare.

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References:-

1. Jiaravuthisan MM, Sasseville D, Vender RB, Murphy F, Muhn CY. Psoriasis of the nail: anatomy, pathology, clinical presentation, and a review of the literature on therapy. J Am Acad Dermatol. jul 2007;57(1):1‑27.
2. Oram Y, Akkaya AD. Treatment of Nail Psoriasis: Common Concepts and New Trends. Dermatol Res Pract. 2013;2013:180496.
3. Cohen MR, Reda DJ, Clegg DO. Baseline relationships between psoriasis and psoriatic arthritis: analysis of 221 patients with active psoriatic arthritis. Department of Veterans Affairs Cooperative Study Group on Seronegative Spondyloarthropathies. J Rheumatol. 1 aug 1999;26(8):1752‑6.
4. Wilson FC, Icen M, Crowson CS, McEvoy MT, Gabriel SE, Kremers HM. Incidence and clinical predictors of psoriatic arthritis in patients with psoriasis: a population-based study. Arthritis Rheum. 15 feb 2009;61(2):233‑9.
5. Langley RG, Daudén E. Treatment and management of psoriasis with nail involvement: a focus on biologic therapy. Dermatol Basel Switz. 2010;221 Suppl 1:29‑42.
6. Salomon J, Szepietowski JC, Proniewicz A. Psoriatic nails: a prospective clinical study. J Cutan Med Surg. aug 2003;7(4):317‑21.
7. Lencastre A, Lamas A, Sá D, Tosti A. Onychoscopy. Clin Dermatol. sept 2013;31(5):587‑93.
8. Golińska J, Sar-Pomian M, Rudnicka L. Dermoscopic features of psoriasis of the skin, scalp and nails – a systematic review. J Eur Acad Dermatol Venereol. apr 2019;33(4):648‑60.
9. Rich P, Scher R. Nail Psoriasis Severity Index: A useful tool for evaluation of nail psoriasis. J Am Acad Dermatol. 1 sept 2003;49:206‑12.
10. Yadav TA, Khopkar US. Dermoscopy to Detect Signs of Subclinical Nail Involvement in Chronic Plaque Psoriasis: A Study of 68 Patients. Indian J Dermatol. jun 2015;60(3):272‑5.
11. Yorulmaz A, Artuz F. A study of dermoscopic features of nail psoriasis. Adv Dermatol Allergol Dermatol Alergol. feb 2017;34(1):28‑35.
12. Long F, He F, Wang J, Wang L, Tu J, Zhang Z, et al. Nailfold capillary abnormalities: a possible cause for nail psoriasis? Br J Dermatol. jan 2021;184(1):178‑80.
13. Wanniang N, Navya A, Pai V, Ghodge R. Comparative Study of Clinical and Dermoscopic Features in Nail Psoriasis. Indian Dermatol Online J. feb 2020;11(1):35‑40.
14. Choi JW, Kim BR, Seo E, Youn SW. Identification of nail features associated with psoriasis severity. J Dermatol. feb 2017;44(2):147‑53.
15. Kyriakou A, Patsatsi A, Sotiriadis D. Detailed analysis of specific nail psoriasis features and their correlations with clinical parameters: a cross-sectional study. Dermatol Basel Switz. 2011;223(3):222‑9.
16. Nakamura RC, Costa MC. Dermatoscopic findings in the most frequent onychopathies: descriptive analysis of 500 cases. Int J Dermatol. apr 2012;51(4):483‑5.
17. Farias DC de, Tosti A, Chiacchio ND, Hirata SH. Dermoscopy in nail psoriasis. An Bras Dermatol. feb2010;85:101‑3.
18. Bhat Y. Onychoscopy. An observational study in 237 patients of Kashmir Valley of North India. Dermatol Pract Concept. 19 nov2018;8:283‑91.
19. Long F, Zhang Z, He F, Tu J, Yin Z, Xia J, et al. Dermoscopic features of nail psoriasis: Positive correlation with the severity of psoriasis. J Dermatol. jun 2021;48(6):894‑901.
20. Hashimoto Y, Uyama M, Takada Y, Yoshida K, Ishiko A. Dermoscopic features of nail psoriasis treated with biologics. J Dermatol. may 2017;44(5):538‑41.
21. You Z, Yang H, Ran Y. Clinical parameters associated with severity of nail psoriasis and therapeutic efficacy. Eur J Dermatol EJD. 1 aug 2020;30(4):362‑71.
22. Iorizzo M, Dahdah M, Vincenzi C, Tosti A. Videodermoscopy of the hyponychium in nail bed psoriasis. J Am Acad Dermatol. apr 2008;58(4):714‑5.
23. Morrissey KA, Rubin AI. Histopathology of the red lunula: new histologic features and clinical correlations of a rare type of erythronychia. J CutanPathol. nov 2013;40(11):972‑5.
24. Luengas-Martinez A, Hardman-Smart J, Paus R, Young HS. Vascular endothelial growth factor-A as a promising therapeutic target for the management of psoriasis. Exp Dermatol. aug2020;29(8):687‑98.