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Original Article

Nailfold capillaroscopic in lupus nephritis patients and its relation to vascular endothelial marker CD31

Rheumatology

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ABSTRACT

Background: Lupus nephritis (LN), commonly arises early in the disease, often within the first 6-36 months, and may occasionally be present at the time of diagnosis. Nailfold capillaroscopy (NFC) is a non-invasive technique for assessing microcirculation and is useful in diagnosing various connective-tissue disorders. Cluster of differentiation 31 (CD31), known as platelet endothelial cell adhesion molecule (PECAM) -1 is a vascular endothelial marker encoded by the PECAM1 gene on chromosome 17.

Objective: Evaluate CD31 as a vascular endothelial marker in LN patients and its correlation with peripheral microvascular involvement assessed by NFC.

Methods: This case-control study conducted on 45 patients with LN and 45 lupus patients without nephritis. All participants underwent clinical assessments and serum CD31 level evaluation. Disease activity was measured using the SLE Disease Activity Index (SLEDAI). NFC was performed using a digital microscope at 500x magnification.

Results: Serum CD31 levels were significantly higher in the LN group compared to the lupus non-nephritis group (p= 0.001). There was a statistically significant difference in capillary width (p= 0.001) and hemorrhage (p = 0.002), both of which were increased in the LN group. Most patients with major NFC score have CD31 levels ≥70 and SLEDAI (p=0.002, p=0.044, respectively). Additionally, patients with major NFC score have renal biopsy grade 3, 4 and 5, while most patients with normal NFC score have renal biopsy grade 2 (p=0.001). The CD31 cutoff ≥70 ng /ml have excellent diagnostic performance for microvascular involvement in SLE with (sensitivity of 97.8%, specificity of 97.8%, PPV of 97.6%, and NPV of 91.7%).

Conclusions: Serum CD31 levels could serve as a valuable marker for assessing disease activity and renal involvement in SLE patients. Abnormalities observed through NFC may indicate the degree of microvascular involvement and correlate with systemic organ manifestations in SLE.

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Keywords: Nailfold capillaroscopy; CD31; systemic lupus erythematosus; SLE; lupus nephritis.

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INTRODUCTION

Systemic lupus erythematosus (SLE) is autoimmune disease that affects multiple tissues and organs throughout the body [1]. The disease is characterized by the production of numerous autoantibodies and immune complexes which lead to cellular damage, primarily targeting vascular endothelial cells. This cellular damage plays a key role in the broad spectrum of clinical manifestations associated with SLE [2]. Lupus nephritis (LN) is a serious complication of SLE that markedly increases both morbidity and mortality rates in patients [3].

Nailfold capillaroscopy (NFC) is a reliable, non-invasive and reproducible method used to assess microcirculation. It is particularly effective in identifying peripheral vascular changes and serves as a diagnostic and predictive tool in individuals with connective tissue disorders [4].

Over the years, numerous serum and urinary biomarkers have been evaluated for their ability to reflect LN disease activity. CD31, known as platelet endothelial cell adhesion molecule (PECAM) -1 is a vascular endothelial marker encoded by the PECAM1 gene on

chromosome 17. CD31 as a promising new marker for the detection of LN [5].

Owing to the key involvement of endothelial dysfunction in microvascular remodeling, resulting from systemic inflammation and its wide-ranging clinical effects, evaluating blood levels of CD31 alongside the application of NCF, a non-invasive, affordable, and accessible technique, could provide deeper insights into vascular damage [6]. This approach aids in enhancing prognosis and implementing targeted therapeutic strategies. Capillaroscopic changes have been linked to disease activity, including LN, indicating their potential utility in evaluating disease severity [7].

Further investigation into the role of microvascular alterations in the disease's pathogenesis could aid in preventing systemic organ dysfunction, such as renal failure, and enhance therapeutic approaches for SLE [8]. This study aimed to evaluate CD31 as a vascular endothelial marker in LN patients and its correlation with peripheral microvascular involvement assessed by NFC.

SUBJECTS AND METHODS

This case control nested study was conducted on 90 subjects recruited from the rheumatology and rehabilitation outpatient clinic at Al Zahraa University Hospital. Based on ultrasound guided renal biopsy, the studied patients were classified into two groups: LN group include 45 patients, and lupus non-nephritis group include 45 patients.

Inclusion criteria: SLE patients aged more than 18 years' old who met ACR\EULAR classification criteria 2019 for diagnosis of SLE [9]. Please add number for this reference and renumber the subsequent references, LN was confirmed by renal biopsy.

Exclusion criteria: Patients with other rheumatological disorders, peripheral arterial diseases, or any occlusive disorders, diseases that induce endothelial dysfunction (such as diabetes mellitus, chronic kidney disease, smoking, and obesity), and those on beta blockers, vasoactive treatments, and anticoagulants were excluded from the study. Additionally, medications like nitrates, lipid-lowering agents, and aspirin were discontinuing for at least one week before enrolment into the study.

Both groups were subjected to comprehensive evaluation, which included a detailed medical history, general examination, and musculoskeletal examination were recorded. Disease activity assessment was done utilizing SLE Disease Activity Index (SLEDAI) [10]. Routine laboratory investigations: white blood cells (WBCs) (10^3 /cmm), platelets count (10^3 /cmm), hemoglobin (HB) gm/dl, creatinine mg/dl, serum urea mg/dl, acute phase reactants: erythrocytic sedimentation rate (ESR) first hour and C-reactive protein (CRP), 24-hour urinary protein, international normalization ratio (INR), and gross appearance of urine. Measurement of serum CD31 level by ELISA technique; with a complete set of Human Cluster of Differentiation 31 ELISA Kit. (Bioassay Technology Laboratory; Cat. No. E7336Hu). Size: 96 wells / 48 wells.

Nailfold capillaroscopy: For optimal skin visibility, a drop of immersion oil was applied to the nailfold prior to capillaroscopy. The examination included all fingers, except the thumbs and any that had undergone recent trauma. The NFC was done utilizing a dynamic usbdino-lite digital capillaroscopy (Taiwan) coupled device camera connected to a PC with a dinocapture version 2.0 version software devoted to calibrating and measure linear dimensions with a magnifications power: 200–600, in which morphological details of a single capillary can be estimated (figure 1). The scoring of NFC findings was done based on Medhat et al. [11]. Score 0: normal (6–8 capillaries/mm2, hairpin-shaped loops arranged in parallel rows, absence of hemorrhages). Score 1: minor changes (6–8 capillaries/mm2, less than 50% tortuous loops, arranged in parallel rows, with no hemorrhages). Score 2: major changes (normal or decreased capillary density, more than 50% tortuous, enlarged loops, disarranged, with hemorrhages) (figure 1).

This study was approved by ethical approval committee of the faculty of medicine for girls, Cairo, Al Azhar University, Egypt. Comprehensive counseling was offered to all participants, and informed consent was duly acquired.

Statistical analysis

The recorded data were analyzed utilizing the Statistical Package for the Social Sciences (SPSS), version 23.0 (SPSS Inc., Chicago, Illinois, USA). The data's normality was estimated utilizing the Kolmogorov-Smirnov and Shapiro-Wilk tests. For quantitative variables with normal distribution, the results were reported as mean ± standard deviation (SD) and ranges while non-parametric data were presented as median with interquartile range (IQR). Qualitative variables were described in terms of frequency and percentages. The chi-square test (X2) and Fisher's exact (FE) test were used for comparison of qualitative variables. Student t-test (t) was used for comparison of normally distributed data between two groups, Mann Whitney U-test (U) was used for comparison of non-parametric variables. The receiver-operating characteristic (ROC) curve was used to identify the optimal cut –off value for CD31 for diagnosis of microvascular involvement among the studied patients [area under the curve (AUC), sensitivity, specificity, positive predictive (PPV), and negative predictive value (NPV)] considering the results of mean ± SD and maximum level of CD31 in Lupus non – nephritis group (control group).

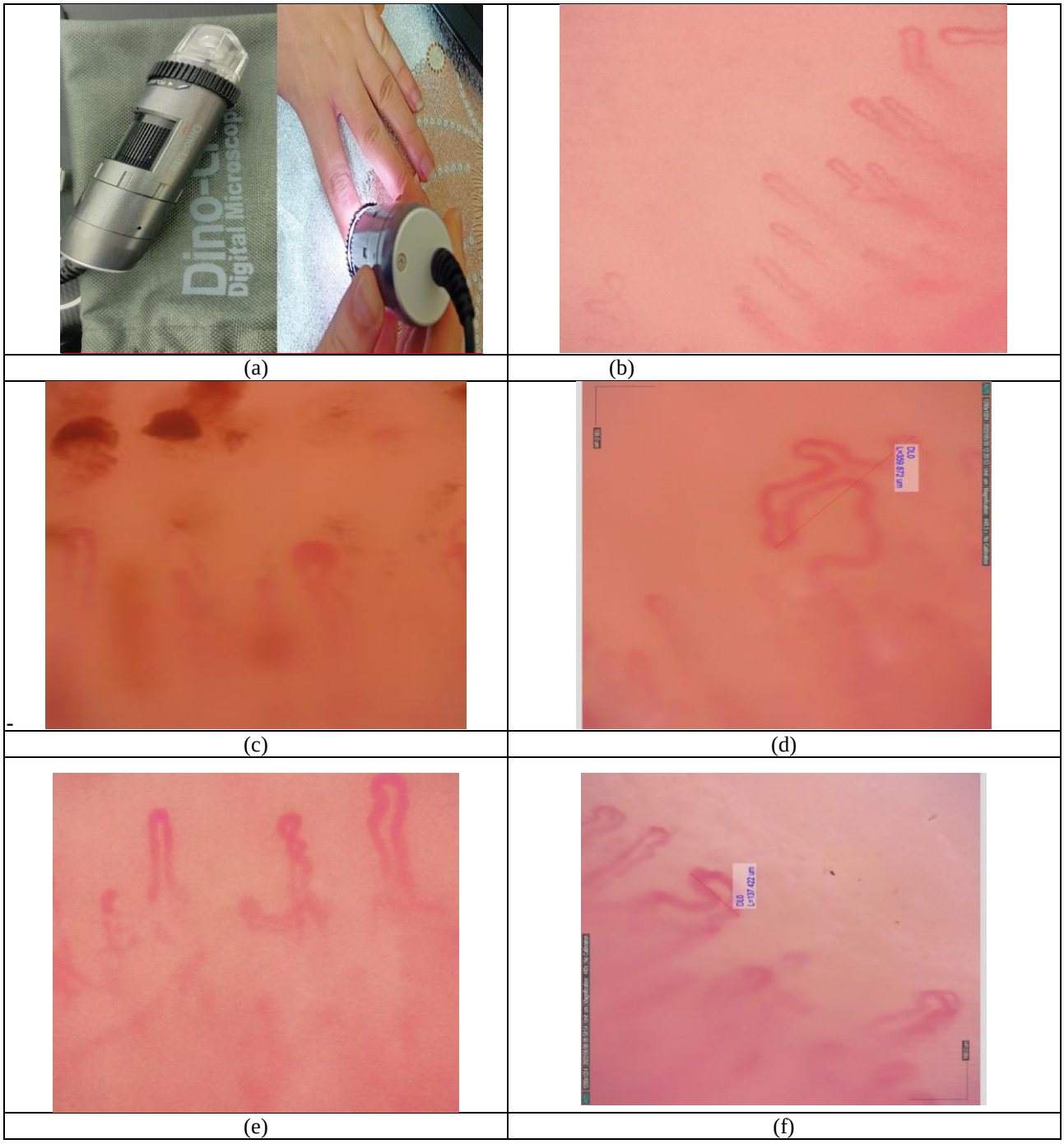

Figure (2): Capillaroscopy device and nailfold capillaroscopic findings in patient with SLE

(a) Capillaroscopy device used in the study with USB cable dinolite version 2.0 software in magnifications: 500x, (b) Normal capillaries (hair pin u- shape, normal density, normal dimensions), (c) Dilated capillaries and micro hemorrhage, (d) Abnormal morphology of capillaries, (e) Dilated and twisted capillaries and low density, (f) Dilated (137μm) and tortious capillaries.

RESULTS

Table (1) demonstrated that the LN group includes 43 females and 2 males, aged between 20-58 years, with disease duration ranged from 3 months to 16 years [median (IQR) of 2 (0.5-5)] years. The non-nephritis group includes 43 females and 2 males, aged between 20-59 years, with disease duration ranged from 5 months to 12 years [median (IQR) of 3 (1.75-11)] years. No statistically significant differences were found between two groups regarding age, sex and disease duration (p-value = 0.753, 1.000 and 0.286 respectively). The hypertension and lower limb edema were significantly common in LN group than lupus non-nephritis group (p = 0.001). (p = 0.010). The frothy urine and hematuria were significantly more common in patients with LN than those without (p = 0.010). Regarding renal biopsy in patients with LN; 9 patients (20%) had grade 2, 21 patients (46.7%) had grade 3, 11 patients (24.4%) had grade 3 and 4 patients (8.9%) had grade 5.

Table (2) revealed that there was statistically significant increase of ESR, CRP, 24-hour urine protein, serum creatinine, serum urea, and CD31 (p < 0.05), with statistically significant decrease of platelet count and Hb

in LN group compared to lupus non-nephritis group ($p < 0.05$). There were no statistically significant differences across groups in accordance with WBCs count, INR, Anti DNA.

Table (1): Comparison of demographic, clinical data, SLE duration, gross urine examination between lupus nephritis group and lupus non-nephritis group

Items		Lupus nephritis (n=45)	Lupus non-nephritis (n=45)	Stat. test	p-value
Age (years)	*Mean ± SD*	*33.87±10.66*	*34.53±9.32*	t=3.16	0.753
	Range	*20-58*	*20-59*		
Sex	Female	43 (95.6%)	43 (95.6%)	FE=0.1	1.000
	Male	2 (4.4%)	2 (4.4%)		
SLE duration (years)	Median (IQR)	3 (1.75-11)	2 (0.5-5)	U=15.83	0.286
	Range	0.25-16	0.42-12		
linical data	Hypertension	27 (60.0%)	10 (22.2%)	X^2=13.2	0.001*
	Lower limb edema	24 (53.3%)	7 (15.6%)	FE=14.2	0.001*
ross ppearance of rine	Normal	22 (48.9%)	37 (82.2%)	FE=11.33	0.010*
	Frothy	17(37.7%)	6 (13.3%)		
	Hematuria	6 (13.3%)	2 (4.4%)		
enal biopsy	Grade 2	9 (20 %)			
	Grade 3	21 (46.7%)			
	rade 4	11 (24.4%)			
	rade 5	4 (8.9%)			

X^2: Chi-square test, FE: Fisher's exact test, t- Student t-test, U: Mann Whitney U test, *: Significant p-value (<0.05).

Table (2): Comparison of laboratory parameters between lupus nephritis group and lupus non-nephritis group

Laboratory parameters		Lupus nephritis (n=45)	Lupus non-nephritis (n=45)	Stat. test	p-value
ESR 1st	Mean ± SD	86.56 ±25.48	64.51 ±18.01	t=3.933	0.001*
	Range	40-150	15-120		
CRP IU	Median (IQR)	24 (10-54)	8 (6-10)	U=4.126	0.001*
	Range	5-200	4-75		
Hb gm	Mean ± SD	9.70 ±1.86	10.68 ±1.44	t=-2.80	0.006*
	Range	6.5-12.5	7-13		
WBCs (10^3 /cmm)	Median (IQR)	7.2 (5.0-8.0)	6.0 (4.80-7.5)	U=-0.86	0.391
	Range	12.0-16.0	3.1-6.1		
Platelet (10^3 /cmm)	Mean ± SD	183.951 ± 494.72.	257.266 ± 656.46	t=-4.77	0.001*
	Range	4200-321	138-390		
INR	Mean ± SD	1.26 ±0.33	1.24 ±0.30	t=0.35	0.739
	Range	1-2.3	1-2.2		
Anti-dsDNA	Negative	7 (15.6%)	11 (24.4%)	FE=1.11	0.292
	Positive	38 (84.4%)	34 (75.6%)		
24 hrs. urine protein	Median (IQR)	936 (610-2194)	153 (115-201)	U=8.832	0.001*
	Range	200-3000	71.8-320		
Serum creatinine mg/dl	Mean ± SD	1.30 ±0.35	1.00 ±0.22	t=2.27	0.026*
	Range	0.5-3.2	0.6-1.6		
Serum urea mg/dl	Mean ± SD	39.96 ±11.80	31.84 ±6.51	U=3.56	0.001*
	Range	19-76	20-45		
CD31 ng /ml	Mean ± SD	106.71±22.64	37.82±11.12	t=12.84	0.001*
	Range	55-160	16-70		

ESR: erythrocyte sedimentation rate, INR: International normalized ratio, CRP: C-reactive protein, Hb.: hemoglobin WBCs: White blood cells, Anti-dsDNA: Anti-(double stranded)-DNA antibodies, CD31: cluster of differentiation 31, X^2: Chi-square test; FE: Fisher's exact test, t- Student t-test, U: Mann Whitney U test, *: Significant p-value (<0.05).

Table (3) demonstrated that there was a statistically significant difference in capillary width ($p = 0.001$) and hemorrhage ($p = 0.002$), both of which were increased and more prevalent in the nephritis group. No statistically significant differences were found regarding capillary density, capillary length, shape, subpapillary venous plexus, and angiogenesis. Regarding NFC findings score; the normal pattern was more

common in the non-nephritis group, with 24 patients (53.3%) compared to 10 patients (22.2%) in the nephritis group. Minor and major changes in the nephritis group were observed in 21 patients (46.7%) and 14 patients (31.1%), respectively. Minor and major changes in the non-nephritis group were observed in 18 patients (40.0%) and 3 patients (6.7%), respectively.

Table (3): Comparison of nailfold capillaroscopic parameters and findings between lupus nephritis group and lupus non-nephritis group

NFC parameters	Lupus nephritis (n=45)	Lupus non-nephritis (n=45)	Stat. test	p-value
Density				
- Score 0	33 (73.3%)	37 (82.2%)	FE=1.158	0.560
- Score 1	7 (15.6%)	4 (8.9%)		
- Score 2	5 (11.1%)	4 (8.9%)		
Capillary width				
- Score 0	24 (53.3%)	11 (24.4%)	FE=18.978	0.001*
- Score 1	15 (33.3%)	32 (71.1%)		
- Score 2	0 (0.0%)	2 (4.4%)		
- Score 3	6 (13.3%)	0 (0.0%)		
Length				
- Score 0	12 (26.7%)	10 (22.2%)	FE=5.062	0.167
- Score 1	21 (46.7%)	29 (64.4%)		
- Score 2	9 (20.0%)	6 (13.3%)		
- Score 3	3 (6.7%)	0 (0.0%)		
Shape				
- Hairpin	11 (24.4%)	10 (22.2%)	$X^2 = 0.062$	0.803
- Tortuous	35 (77.8%)	33 (73.3%)	$X^2 = 0.241$	0.624
- Twisted	30 (66.7%)	35 (77.8%)	$X^2 = 1.385$	0.239
Sub papillary plexus				
- Score 0	38 (84.4%)	40 (88.9%)	FE=0.385	0.535
- Score 1	7 (15.6%)	5 (11.1%)		
Angiogenesis				
- Score 0	39 (86.7%)	43 (95.6%)	FE=2.195	0.138
- Score 1	6 (13.3%)	2 (4.4%)		
Hemorrhage				
- Score 0	36 (80.0%)	45 (100.0%)	FE=10.000	0.002*
- Score 1	9 (20.0%)	0 (0.0%)		
NFC changes				
- Normal (no changes)	10 (22.2%)	24 (53.3%)	FE=8.582	0.019
- Minor changes	21 (46.7%)	18 (40.0%)		
- Major changes	14 (31.1%)	3 (6.7%)		

NFC: Nailfold capillaroscopic parameters, X^2: Chi-square test, FE: Fisher's exact test, *: Significant p-value (<0.05).

Table (4): Comparison of CD31 and SLEDAI score among nailfold capillaroscopic scores in total studied patients

Item		Normal (n=34)	Minor (n=39)	Major (n=17)	Stat. test	p-value
CD31 ng /ml	Cut-off <70	29 (85.3%)	17 (43.6%)	2 (11.8%)	FE=9.276	0.002*
	Cut-off ≥70	5 (14.7%)	22 (56.4%)	15 (88.2%)		
SLEDAI	Mild or Moderate	26 (76.5%)	26 (66.7%	3 (17.6%)	FE=7.221	0.044*
	Severe	8 (23.5%)	13 (33.3%)	14 (82.4%)		

CD31: Cluster of differentiation 31, SLEDAI: Systemic lupus erythematosus disease activity index, FE: Fisher's exact test, *: Significant p-value (<0.05).

Table (5): Relation between nailfold capillaroscopic changes and kidney biopsy grades among nephritis group

Biopsy	Normal n=10	Minor n=21	Major n=14	Stat. test	p-value
Grade 2	7 (70.0%)	2 (9.5%)	0 (0.0%)	FE=29.01	0.001*
Grade 3	2 (20.0 %)	13 (61.9%)	6 (42.9%)		
Grade 4	1 (10.0%)	6 (28.6%)	4 (28.6%)		
Grade 5	0 (0.0%)	0 (0.0%)	4 (28.6%)		

FE: Fisher's exact test, *: Significant p-value (<0.05).

Table (6): Clinical utility of CD31 in diagnosis of microvascular involvement in SLE

Items	Cut-off	AUC	Sensitivity	Specificity	PPV	NPV	p-value
CD31 ng /ml	**>70**	0.944	91.1%	97.8%	97.6%	91.7%	<0.001**

PPV: Positive predictive value, NPV: Negative predictive value, AUD: Area under the curve, *: Significant p-value (<0.05).

Table (4) showed that most patients with minor or major changes (56.4%, 88.2% respectively) have serum level of CD31 ≥70 mg/dl, while those with normal NCF score (have CD1 level <70mg/dl (85.3%) (p=0.002). Moreover, most patients with major NFC score (82.4%) have severe SLEDAI, while those with minor NFC score have mild or moderate SLEDAI (p=0.044). Table (5) revealed a significant relationship between NFC scores and grades of kidney biopsy among patients with LN as more than half of patients with major NFC score have renal biopsy grade 4 or 5, 61.9% of patients with minor NFC score have renal biopsy grade 2, and 70% of those with normal NFC score have renal biopsy grade 2 (p=0.001).

Table (6) and (figure 2) demonstrated that using ROC curve a CD31 cutoff >70 ng /ml is the optimal cut –off for detection of vascular involvement with (AUC) = 0.944, sensitivity 91.1% and specificity 97.8% of Positive predictive value of 97.6%).

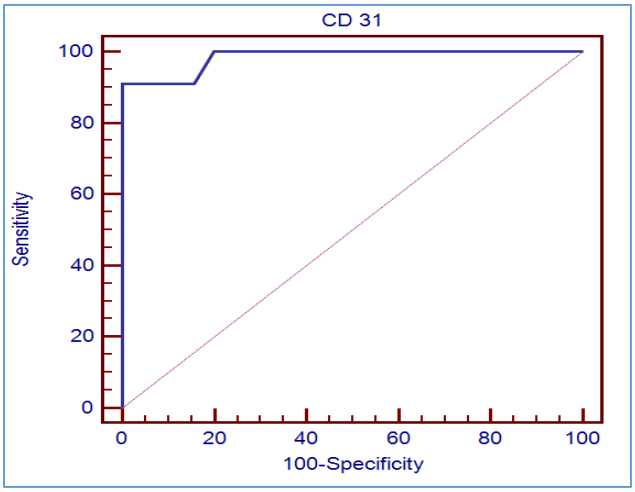

Figure (2): Receiver-operating characteristic curve for vascular endothelial marker using the CD31

DISCUSSION

The SLE is autoimmune condition that commonly impacts multiple tissues and organs [12]. This disease is associated with the generation of various autoantibodies, immune complexes, and cellular injury, primarily manifesting as damage to vascular endothelial cells [13]. Vascular damage driven by immune mechanisms and the ensuing angiogenesis are major pathogenic elements that profoundly affect the involvement of various organ systems [14].

In the present study, there was a female predominance in both groups with age ranged from 20-59 years and disease duration ranged from few months up to 16 years that was in agreement with the study by Zhao et al. [15], and Riccieri et al. [16]. Additionally, we found that the anti-dsDNA antibody was positive in 84.4% of LN group and 75.6% in lupus non-nephritis group with non-significant difference between both groups. This was similar to the study by Zhao et al. [15], who reported that 88.2% of lupus patients had a positive result for anti-dsDNA antibodies. Moreover, our studiedLN group than lupus nephritis group was disagreed with the study by Kuryliszyn et al. [17] who found no statistically significant differences in SLE patients with and without systemic organ involvement according to ESR and CRP.

The current study revealed that the LN group had significantly higher scores for capillary width and nailfold hemorrhage compared to lupus non-nephritis group. This finding indicates that patients with LN demonstrates more affection of microvasculature. Similar result was reported by Adel et al. [18] who reported that the capillary width and capillary hemorrhage were significantly common in patients with LN nephritis compared to those with primary glomerulonephritis. Additionally, with the advancement of LN classes, both capillary diameter and length increased significantly in their study.

In the current study we found an association between NFC and lupus activity index as that patients with increased NFC changes have higher SLEDAI score. This finding is in agreement with the study by Medhat *et al.* [11] which found a strong positive significant association between SLE activity, measured by the SLEDAI score, and capillaroscopic changes, especially hemorrhage (p<0.001). Similarly, Hamza et al. [19] found that the progression of NFC scores was directly related to lupus activity and internal organ involvement, particularly nephritis. Additionally, studies conducted by Shenavandeh and Habibi [12] and Ingegnoli [20], reported significantly higher incidence of capillaroscopic abnormalities, most frequently

hemorrhage in patients active SLE than patients with no active lupus. Similarly, studies by Riccieri et al. [16], Ciołkiewicz et al. [21], and Nasser et al. [22] also stated that there was a significant positive association between the severity of capillaroscopic changes and the SLEDAI.

In the present study, we found statistically significant association between renal biopsy scores and NFC scores (p = 0.001) as patients with higher NFC changes (minor and major) have higher biopsy grades (Grade 3 and above). This finding indicate that the same pathological changes of renal vasculature in kidney are present in the peripheral microvasculature. This was in agreement with the results of study by Medhat et al. [11] who found a statistically significance difference between minor and major nailfold capillaroscopic changes according to grades of renal biopsy (p = 0.042).

In the present study, we found highly significant increase of CD31 marker in patients LN than those with lupus non-nephritis group (p= 0.001). This was in agreement with another study by Fayed et al. [5], which showed significantly higher levels of CD31 in LN and lupus without nephritis compared to controls (p <0.001), and significantly higher levels of CD31 in LN cases compared to lupus without nephritis (p <0.016).

In our study, there was a highly statistically significant association between the SLEDAI and CD31, the CD31 levels being elevated in patients with high disease activity scores. This finding means that CD31 as a marker of endothelial dysfunction could be used as a biomarker of lupus activity. This was in agreement with a study by Ryan [23] which showed that endothelial dysfunction is positively correlated with disease activity score. However, it disagrees with the study by Fayed et al. [5], which showed no significant correlation between SLEDAI score and CD 31.

We found a statistically significant association between NFC changes and CD31 levels, with higher levels in patient with major changes compared to those with minor changes or normal NFC. This agrees with the study by Ciołkiewicz et al. [21] who stated that a significant positive correlation between the severity of NFC changes and endothelial dysfunction (p<0.001).
Our study demonstrated the CD31 cutoff >70 ng /ml have good diagnostic performance for detection of microvascular involvement in SLE patients.

CONCLUSIONS

CD31 and NFC can act as non-invasive tools for the early detection of microvascular involvement and endothelial dysfunction in individuals with SLE. The serum level of CD31 could serve as an effective marker for evaluating disease activity and renal involvement in SLE patients. Abnormal NFC changes are common in SLE patients and are associated with disease activity. Endothelial dysfunction is more pronounced in patients with SLE, particularly those with nephritis. We recommend using NFC as a supplementary tool for the early diagnosis of LN, and further clinical research with larger sample sizes is needed to establish CD31 as a prognostic marker in LN, as well as to explore the correlation between serum CD31 levels and NFC findings in SLE patients.

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الملخص العربى

الفحص الميكروسكوبى لثنايا الأظافر فى إلتهاب الكلى المصاحب لمرضى الذئبة الحمراء وعلاقته بـ (سي دي 31 كعلامة لبطانة الاوعية الدموية)

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ملخص البحث:

الخلفية :عادةً ما يحدث التهاب الكلي الذئبي في وقت مبكر من مسار المرض، بشكل عام خلال أول 6 إلى 36 شهرًا، وقد ينشأ في بداية تشخيص المرض. يعد ميكروسكوب الشعيرات الدموية تقنية تشخيصية غير جراحية تستخدم فى تقييم اعتلال الأوعية الدموية الدقيقة الطرفية فى ثنايا الأظافر ويُعتبر مفيدًا في تشخيص العديد من اضطرابات الأنسجة الضامة. يعتبر سى دى31 و المعروف بجزيء التصاق الخلايا البطانية للصفائح الدموية علامة لتأثر الخلايا البطانية و يتم ترميزه في البشر بواسطة جين بيكام 1 الموجود على كروموسوم 17.

الهدف: تقييم سى دى 31 كعلامة لبطانة الأوعية الدموية في مرضى التهاب الكلي الذئبي وعلاقته بتغيرات الدورة الدموية الطرفية بإستخدام ميكروسكوب الشعيرات الدموية في ثنايا الأظافر.

الطرق: أجريت دراسة الحالات – الشواهد هذه على 45 مريضا بالتهاب الكلي الذئبي و 45 مريضا بالذئبة الحمراء بدون التهاب الكلى. خضع جميع المشاركين لتقييم سريري وقياس مستوى سى دى 31 فى الدم. تم تقييم نشاط المرض باستخدام مؤشر نشاط مرض الذئبة الحمراء. تم فحص جميع المرضى بمكروسكوب الشعيرات الدموية لثنايا الاظافر بتكبير 500 مرة.

النتائج : كانت مستويات سى دى 31 فى الدم أعلى إحصائيا في مجموعة مرضى التهاب الكلي الذئبي مقارنة بمجموعة مرضى الذئبة بدون التهاب الكلى. كانت هناك اختلافات ذات دلالة إحصائية في عرض الشعيرات الدموية والنزيف حيث كان كلاهما مرتفعا فى مجموعة مرضى التهاب الكلي الذئبي. معظم المرضى المصابون بتغيرات كبيرة فى الفحص الميكروسكوبى كان لديهم مستوى سى دى 31 اعلى من 70 و نشاط المرض. بالاضافة الى ان المرضى المصابون بتغيرات كبيرة فى الفحص الميكروسكوبى كان لديهم درجة 3، 4، 5 في عينة الكلى، بينما معظم المرضى الذين كان الفحص الميكروسكوبى لديهم طبيعى كان لدريهم درجة 2 في عينة الكلى. ال سى دى 31 عند قيمة ≤70 لديه قدرة تشخيصية ممتازة لتشخيص إصابة الأوعية الدموية الدقيقة فى مرضى الذئبة الحمراء (حساسية 97.8٪، خصوصية 97.8٪، قيمة تنبؤية موجبة 97.6٪، و قيمة تنبؤية موجبة 91.7٪).

الأستنتاجات: يعتبر سى دى 31 عامل مهم لتقييم نشاط مرض الذئبة الحمراء وأيضا للتشخيص المبكر لتأثر الكلى بالمرض. قد تشير التغيرات التي يتم كشفها من خلال التصوير بميكروسكوب الشعيرات الدموية لثنايا الاظافر إلى درجة التأثيرعلى الأوعية الدقيقة ومدى ارتباطها باعراض اصابة الاجهزة الداخلية لمرضى الذئبة.

الكلمات المفتاحية: ميكروسكوب الشعيرات الدموية لثنايا الاظافر؛ سى دى 31؛ مرض الذئبة الحمراء؛ التهاب الكلى الذئبى

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