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Senile Purpura: Clinical Features and Related Factors

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Dear Editor:

Senile or actinic purpura commonly presents as purpuric macules and patches on the sun-exposed skin in elderly individuals. The prevalence of senile purpura is approximately 10% in elderly individuals¹. Senile purpura is considered a consequence of skin aging primarily attributable to photodamage and is often called dermatoporosis². Although it is a common and clinically important condition, only a few studies have described in detail the clinical features or factors related to senile purpura³.

We performed a cross-sectional study using questionnaires to assess the clinical features and other factors related to

senile purpura at Seoul National University Hospital (SNUH) and 20 local senior welfare centers between October and December 2017. The study protocol was approved by the Institutional Review Board of SNUH (IRB no. 1708-137-879), and written informed consent was obtained from all participants.

Patients enrolled in the study were asked whether they have/had senile purpura. Using a digital thickness micrometer (Mitutoyo Corporation, Kanagawa, Japan), double fold of skin thickness was measured at the level of the extensor area of the right lower arm 15 cm away from the elbow.

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We used 2 questionnaires in this study—the first to assess the epidemiology and the second to assess other factors related to senile purpura. The epidemiological questionnaire included information regarding present lesions or a history of senile purpura, age of onset, frequency of development of lesions, persistence, sites of lesions, seasonal variations, inciting factors, inconvenience, and intent-to-treat analysis.

The questionnaire regarding other factors related to senile purpura included the patient's medical history, lifestyle factors, and sun exposure-related factors, skin care habit and occupational history. Diagnosis of current lesions was confirmed based on the history and the current medications administered. The questionnaire assessing sun exposure-related factors was a modified version obtained from Zhu et al.⁴

The IBM SPSS software version 23.0 (IBM Corp., Armonk, NY, USA) was used for statistical analysis. The Pearson's chi-square test, the Fisher exact test, or the linear association method was used to compare categorical data. The Student's t-test or the Mann-Whitney U test was used for intergroup comparisons of continuous variables. Binary logistic regression was performed to assess the other factors related to senile purpura. Patient-related factors that showed $p < 0.10$ using univariate logistic regression analysis were subjected to multivariate logistic regression analysis. A p -value < 0.05 was considered statistically significant.

Among the patients investigated, 57 (29.5%) reported senile purpura at the time of this study ($n = 27$, 14.0%) or a history of senile purpura ($n = 30$, 15.5%). The mean age of onset was 71.0 ± 10.0 years. The most common site of purpuric lesions was the lower arms and hands ($n = 55$, 96.5%), followed by the lower legs and feet ($n = 30$, 52.6%), and the thighs ($n = 20$, 35.1%). Approximately one-third of the patients investigated ($n = 17$, 29.8%) reported that they almost always had senile purpura lesions. More than 50% of patients ($n = 34$, 59.6%) reported that the purpuric lesions persisted for < 2 weeks, whereas 11 (19.3%) patients reported that their lesions lasted > 3 weeks. Most patients ($n = 40$, 70.2%) reported no seasonal clinical fluctuations. More than 50% of patients (54.4%) reported that minor trauma was an inciting factor. Notably, 22 (38.6%) patients did not report any inconvenience from senile purpura, whereas 13 (22.8%) reported interference in their daily lives (Supplementary Table 1).

No statistically significant differences were observed in demographic characteristics between patients with senile purpura and controls (Table 1). Skin thickness in the senile purpura group was lesser than that in the control group. ($p = 0.010$) Cardiac disease, dyslipidemia, and antico-

agulation treatment rates in the senile purpura group were significantly higher than those in the control group ($p = 0.003$, 0.018 , and < 0.001 in each).

In terms of lifestyle, patients with senile purpura showed a higher smoking tendency ($p = 0.010$) and a lower disposition for exercise, although the difference was statistically non-significant (mild exercise, $p = 0.065$; Supplementary Table 2). Other lifestyle factors did not appear to be statistically significant. No significant intergroup difference was observed in both lifetime sun exposure and other sun exposure-related factors (Supplementary Table 3).

Univariate logistic regression analysis showed 7 statistically significant factors (Table 2). Multivariate analysis showed that dyslipidemia ($p = 0.003$), anticoagulant treatment ($p = 0.027$), a history of dermatological disease ($p = 0.004$), and mild exercise (none vs. 5~7 days per week, $p = 0.017$) demonstrated statistically significant intergroup differences.

Senile purpura is considered a self-healing cutaneous disease without sequelae. Recently, skin tears are commonly being reported and are bothersome issues in elderly patients⁵. Most clinical aspects of senile purpura observed in this study concurred with previous studies. Lesions were most commonly observed on the extremities, and usually disappeared within 3 weeks. Most patients did not view this condition as more than a cosmetic issue at best; how-

Table 1. Demographics and medical history of the subjects

Characteristic	Senile purpura (n = 57)	Control (n = 136)	p-value
Sex (male/female)	27/30	46/88*	0.090
Age (yr)	78.2 ± 6.6	77.5 ± 6.2	0.524
Height (cm)	160.2 ± 9.5	158.3 ± 7.5	0.216
Weight (kg)	59.0 ± 9.1	8.5 ± 10.2	0.757
Body mass index (kg/m ²)	23.4 ± 3.1	23.43 ± 3.2	0.873
Skin double-fold thickness (mm)			0.010
< 4	18 (31.6)	28 (20.6)	
4~6	23 (40.4)	62 (45.6)	
> 6	9 (15.8)	46 (33.8)	
Previous history of stroke	3 (5.3)	6 (4.4)	0.725
Cardiac disease	15 (26.3)	13 (9.6)	0.003
Hypertension	37 (64.9)	71 (52.2)	0.105
Diabetes mellitus	15 (26.3)	29 (21.3)	0.451
Dyslipidemia	24 (42.1)	34 (25.0)	0.018
Anticoagulation treatment	23 (44.2) [†]	22 (17.3) [‡]	< 0.001
Any dermatologic disease history	34 (59.6)	38 (27.9)	< 0.001
Other diseases history	22 (38.6)	40 (29.4)	0.213

Values are presented as number only, mean ± standard deviation, or number (%). *Two missing values exist. †Five missing values exist. ‡Nine missing values exist.

Table 2. Logistic regression analysis for the related factors of senile purpura

Characteristic	Purpura/without purpura (number)	Unadjusted OR (95% CI)	p-value	Adjusted OR (95% CI)*	p-value
Sex					
Male	27/46	Reference		Reference	
Female	30/88	0.581 (0.309~1.091)	0.091	1.313 (0.309~5.578)	0.712
Cardiac disease					
No	42/123	Reference		Reference	
Yes	15/13	3.379 (1.487~7.681)	<0.001	1.930 (0.585~6.366)	0.280
Dyslipidemia					
No	33/102	Reference		Reference	
Yes	24/34	2.182 (1.135~4.194)	0.019	4.088 (1.598~10.458)	0.003
Anticoagulant treatment					
No	29/105	Reference		Reference	
Yes	23/22	3.785 (1.852~7.735)	<0.001	3.052 (1.138~8.186)	0.027
Any dermatologic disease history					
No	23/98	Reference		Reference	
Yes	34/38	3.812 (1.994~7.290)	<0.001	3.586 (1.490~8.633)	0.004
Skin double fold thickness (mm)					
>6	9/46	Reference		Reference	
4~6	23/62	1.896 (0.802~4.480)	0.145	2.115 (0.719~6.223)	0.174
<4	18/28	3.286 (1.299~8.310)	0.012	2.436 (0.735~8.077)	0.146
Smoking (pack year)					
Non-smoker	30/98	Reference		Reference	
Less than 20	9/14	2.100 (0.827~5.333)	0.119	2.555 (0.539~12.119)	0.237
More than 20	17/22	2.524 (1.188~5.363)	0.016	4.025 (0.718~22.554)	0.113
Mild exercise activity					
None	15/23	Reference		Reference	
1~4 days per week	13/25	0.797 (0.313~2.029)	0.635	0.424 (0.122~1.478)	0.178
5~7 days per week	29/88	0.505 (0.233~1.096)	0.084	0.262 (0.088~0.783)	0.017

OR: odd ratio, CI: confidence interval. *Adjusted for age, sex and all variables above mentioned.

ever, >20% of patients reported that senile purpura lesions interfered with their daily life.

Senile purpura is often called actinic purpura owing to its association with chronic sun exposure⁶. Interestingly, we did not observe any distinct correlation between senile purpura and a history of sun exposure. Notably, in this study, medical and lifestyle factors were significantly associated with senile purpura. Anticoagulant therapy frequently induces purpura and is also an independent risk factor for dermatoporosis⁷. Evidence regarding the association between dyslipidemia and senile purpura is limited. It can be assumed that dyslipidemia might cause dysfunction or inflammation of cutaneous vessels^{8,9}. The association between senile purpura and a history of dermatological disease might be explained by exposure to topical or systemic corticosteroids, which is a known risk factor for dermatoporosis^{2,10}. Multivariate analysis showed that lack of exercise is a significant factor related to senile purpura. Previous studies have reported that exercise is associated with increased skin thickness¹⁰.

Limitations of our study: 1) The cross-sectional design of

this study did not allow assessment of the cause-and-effect relationship; 2) This was a questionnaire-based study; thus, medical history was not obtained from the medical record system and recall bias could have potentially interfered in the questionnaires.

In conclusion, this study suggests that current medication status including dyslipidemia or anticoagulants, a history of dermatological disease, and lack of exercise could potentially serve as factors related to the development of senile purpura. Further studies are required to elucidate the pathophysiology of senile purpura.

SUPPLEMENTARY MATERIALS

Supplementary data can be found via <http://anndermatol.org/src/sm/ad-31-472-s001.pdf>.

CONFLICTS OF INTEREST

The authors have nothing to disclose.

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Supplementary Table 1. Clinical features of 57 senile purpura patients

Characteristic	Category	Number (%)
Site*	Face	7 (12.3)
	Trunk	3 (5.3)
	Upper arms	11 (19.3)
	Lower arms and hands	55 (96.5)
	Thigh	20 (35.1)
	Lower legs and feet	30 (52.6)
Frequency	Almost always	17 (29.8)
	Twice a month or more	6 (10.5)
	Once a month	4 (7.0)
	Once in two or three months	8 (14.0)
	Not answered	22 (38.6)
Persistence	More than 3 weeks	11 (19.3)
	2~3 weeks	4 (7.0)
	1~2 weeks	21 (36.8)
	Less than 1 week	13 (22.8)
	Not answered	8 (14.0)
Seasonal variation	Always (no variation)	40 (70.2)
	Spring	2 (3.5)
	Summer	7 (12.3)
	Autumn	0 (0.0)
	Winter	2 (3.5)
	Not answered	6 (10.5)
Inducing factor	Indoor activity	8 (14.0)
	Outdoor activity	8 (14.0)
	Minor trauma	31 (54.4)
	No	13 (22.8)
	Not answered	1 (1.8)
Inconvenience	Uncomfortable daily life	13 (22.8)
	Cosmetic problem	22 (38.6)
	None	22 (38.6)

*Duplicate responses allowed.

Supplementary Table 2. Life style factors in senile purpura group and control group

Characteristic	Category	Senile purpura (n=57)	Control (n=136)	p-value
Smoking	Non-smoker	30 (52.6)	98 (72.1)	0.010
	<20 pack year	9 (15.8)	14 (10.3)	
	≥20 pack year	17 (29.8)	22 (16.2)	
Drinking	Frequency	0.68±1.38	0.90±1.90	0.431
	Dose	1.03±2.38	1.18±2.74	0.717
Intense exercise activity	None	56 (98.2)	125 (91.9)	0.096
	1~4 days per week	1 (1.8)	9 (6.6)	
	5~7 days per week	0 (0)	2 (1.5)	
Moderate exercise activity	None	45 (78.9)	105 (77.2)	0.963
	1~4 days per week	5 (8.8)	16 (11.8)	
	5~7 days per week	7 (12.3)	15 (11.0)	
Mild exercise activity	None	15 (26.3)	23 (16.9)	0.065
	1~4 days per week	13 (22.8)	25 (18.4)	
	5~7 days per week	29 (50.9)	88 (64.7)	
Moisturizer habit	Never	34 (59.6)	86 (63.2)	0.507
	Rarely	2 (3.5)	5 (3.7)	
	Sometimes	6 (10.5)	19 (14.0)	
	Often	4 (7.0)	6 (4.4)	
	Always	11 (19.3)	20 (14.7)	
Skin irritating habit	Never	17 (29.8)	29 (21.3)	0.926
	Rarely	3 (5.3)	10 (7.4)	
	Sometimes	9 (15.8)	41 (30.1)	
	Often	20 (35.1)	40 (29.4)	
	Always	8 (14.0)	16 (11.8)	
Life time working (yr)	Indoor blue-collar	21.17±22.22	24.73±23.60	0.353
	Outdoor blue-collar	7.37±14.79	7.26±15.24	0.966
	White-collar	6.65±12.70	6.18±12.41	0.820
Occupational history	Outdoor labor	34 (59.6)	77 (56.6)	0.698
	Indoor labor	16 (28.1)	36 (26.5)	0.842
	Office work	15 (26.3)	33 (24.3)	0.784

Values are presented as number (%) or mean±standard deviation.

Supplementary Table 3. Sun exposure-related factors in senile purpura group and control group

Characteristic	Category	Senile purpura (n=57)	Control (n=136)	p-value
Life time blistering sunburn	None	50 (87.7)	126 (92.6)	0.276
	1~5	5 (8.8)	7 (5.1)	
	6~10	2 (3.5)	2 (1.5)	
	>10	0 (0.0)	1 (0.7)	
Sunscreen habit	Never	46 (80.7)	106 (77.9)	0.630
	Rarely	2 (3.5)	6 (4.4)	
	Sometimes	3 (5.3)	8 (5.9)	
	Often	3 (5.3)	2 (1.5)	
	Always	3 (5.3)	14 (10.3)	
Wear a shirt with sleeves covering shoulders	Never	19 (33.3)	50 (36.8)	0.992
	Rarely	5 (8.8)	4 (2.9)	
	Sometimes	7 (12.3)	12 (8.8)	
	Often	4 (7.0)	17 (12.5)	
	Always	22 (38.6)	52 (38.2)	
Stay in the shade or under an umbrella	Never	15 (26.3)	29 (21.3)	0.564
	Rarely	1 (1.8)	13 (9.6)	
	Sometimes	12 (21.1)	32 (23.5)	
	Often	18 (31.6)	44 (32.4)	
	Always	11 (19.3)	18 (13.2)	
Life time sun exposure (h)	Summer	48,491.9±21,439.8	52,884.8±22,165.4	0.243
	Winter	43,917.8±21,902.1	42,612.2±23,389.2	0.740

Values are presented as number (%) or mean±standard deviation.