Dermatology Practical & Conceptual

Sexual Functions are Impaired in Males and Females with Chronic Spontaneous and Inducible Urticaria; A Controlled Study

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ABSTRACT

Introduction: Sexual dysfunction (SD) related to chronic dermatological diseases in females and males have been reported in the literature, but there are few reports on the effects of chronic urticaria (CU) on male and female sexual function.

Objectives: The aim was to investigate the prevalence of SD in females and erectile dysfunction (ED) caused by two different CU subtypes.

Methods: Our study included 100 patients with CU (60 chronic spontaneous urticaria ([CSU]) and 40 chronic inducible urticaria [CIndU]) and 60 healthy controls. The Urticaria Activity Score 7, Urticaria Control Test, Dermatology Life Quality Index, Beck Depression Inventory, International Index of Erectile Function (IIEF), and Female Sexual Function Index (FSFI) were assessed in patients and controls.

Results: Patients with CSU and CIndU had a higher prevalence of female SD (83% and 70%, respectively, vs 20%; P <0.001) and ED (43% and 50%, respectively vs 10%; P <0.05, for all) than controls. CSU and CIndU patients both had lower FSFI scores than controls (median 23.35 and 23.9, respectively, vs controls 30.75; P <0.001). Overall score of IIEF was lower in the CSU group than in the control group (median 60 vs 67; P = 0.005). Depressive symptoms both in males and females with CU was associated with more impairment in sexual functions (r=-0.44, r=-0.47; P <0.001).

Conclusions: Sexual function is affected in both female and male patients with CSU and CIndU. Given that sexual health is a crucial aspect of QoL, it should be considered when assessing treatment outcomes and disease control.

Introduction

Chronic urticaria (CU) is characterized by recurrent episodes of wheals (hives), angioedema, or both lasting for more than six weeks [1]. CU can be spontaneous (chronic spontaneous urticaria – CSU) or can be triggered by specific physical or non-physical factors (inducible urticarias – CIndUs) [1,2]. CU is a long-lasting disease, and all symptoms have a substantial impact on patients' quality of life (QoL). CU is associated with a high burden on patient life [3]. CU affects many aspects of daily life and may lead to sleep disturbances, psychiatric disorders, impaired daily activities, missed work, and productivity impairments [3-6]. Sexual function is a major and essential component of life and well-being. Sexual dysfunction (SD) in females includes hypoactive sexual desire disorder, sexual aversion disorder, arousal disorder, female orgasmic disorder, and pain disorders. SD may originate from a biological or organic condition, a psychological condition, and/or a social condition [7]. Erectile dysfunction (ED) is a common condition, with a prevalence range from 10% to 48%, and is defined as the consistent or recurrent inability to maintain penile erection sufficient for sexual satisfaction. It is known to be associated with psychological conditions, cardiovascular disease, diabetes mellitus, metabolic syndrome, and hypertension [8]. SD in females and ED in males have been reported in patients with atopic dermatitis, psoriasis, or other chronic dermatological diseases [9-11]. Skin has an ergogenic function, and skin lesions may have a negative effect on sexual health [12]. Skin diseases can cause psychosocial problems and may affect the QoL. Impaired QoL, and depression and anxiety associated with a chronic skin disease are theories hypothesised to lead to the development of SD [9].

Although CU is a common disease in adult females and males, little has been published on its effect on female and male sexual function, and there are few studies in the literature that evaluate sexual function in CIndU patients [12-14]. In CIndU patients, disease duration is longer, disease control and QoL are poorer [15], and physical triggers such as pressure, stroking skin, and increase in body temperature may exacerbate the disease [2].

Objective

In the current study, we aimed to investigate sexual function in patients with CSU and CIndU and how disease characteristics were associated with SD.

Methods

One hundred patients with CU (age range 18–45 years, 50 females and 50 males; 30 patients with CSU; and 20 patients with CIndU of each sex) and 60 healthy controls (30 females and 30 males) were included in this study. All included patients and controls were sexually active; patients with pregnancy, lactation, menopause, major psychiatric disorders, history of previous pelvic organ surgery, systemic diseases, or intake of psychiatric drugs, antiepileptics, or oral hormone therapy were excluded. Patients with CU for at least three months and those over 18 years of age were included. The study was approved by the institutional ethics committee (number of IRB: 1329, 28.05.2019) and was conducted according to the Declaration of Helsinki. Written informed consent were obtained from all participants.

Age, sex, disease duration, accompanying angioedema, Urticaria Activity Score (UAS) 7 of patients with CSU, Beck Depression Inventory (BECK-D), Dermatology Life Quality Index (DLQI), urticaria control test (UCT) scores, International Index of Erectile Function (IIEF) of male patients, and Female Sexual Function Index (FSFI) were assessed in the patient group. Age, sex, BECK-D, IIEF, and FSFI were assessed in the control group.

Clinical Measures Performed

The BECK-D is a self-reported measure with 21 items. It evaluates cognitive, affective, and somatic symptoms of depression experienced during the previous two weeks. Patients with Beck-D scores ≥17 were defined as having depressive symptoms [16]. The DLQI consists of 10 questions and assesses the effect of skin diseases on QoL; each question is scored from 0 to 3. The higher the score, the more impaired QoL [17]. The UCT is a 4-question tool, and each question has five answer options. Total UCT score is the sum of all four individual item scores (0-16 points). A score of ≥12 shows well-controlled urticaria [15]. The UAS is a self-completed diary combining severity of pruritus and number of wheals every day. Hives and pruritus scores are summed over seven days to have UAS7 (0-42 points) [18]. The IIEF is composed of 15 items assessing male SD over the previous four weeks (five domains: erectile dysfunction, orgasmic function, sexual desire, ejaculation, intercourse, and overall satisfaction). Each question has a value ranging from 1 to 5, with low values indicating a poor quality sex life. For the erectile function domain, values of 26 or higher were defined as no ED [19]. The FSFI assesses female sexual function over the previous four weeks and is composed of 19 questions (six subscales: sexual desire, arousal, lubrication, satisfaction, orgasm, and pain during sexual intercourse); each question is scored from 0 to 5. Total FSFI values of 26 or less were defined as SD [20].

Statistical Analysis

All statistical analyses were performed using SPSS (IBM SPSS Statistics version 22). All numerical variables are reported

as the mean±standard deviation, median, minimum, maximum, frequency, and percentages. Differences in measured parameters among the patients with CSU, CIndU, or control group were analyzed with Mann-Whitney U test (age, disease duration, UCT, DLQI, Beck-D, FSFI, IIEF scores and subdomains). The comparison between qualitative variables of the groups such as sex, accompanying AE, and the presence of SD were analyzed with Pearson's Chi-square test or Fisher's Exact test. The correlation between all variables was analyzed by Spearman's rho. Weak, moderate, and strong correlations were defined as correlation coefficient values of <0.3, 0.3-0.5, >0.5 respectively. A p-value of <0.05 was regarded as statistically significant.

Results

The patient characteristics are summarized in Tables 1 and 2. The ages of the CSU and CIndU patients were similar to that of controls in both sex groups (P >0.05) (Tables 1 and 2). Of the female CIndU patients, 13 (65%) had symptomatic dermographism (SDerm), followed by delayed pressure urticaria (DPU) (N=3, 15%), cholinergic urticaria (CholU) (N=2, 10%), heat (N=1, 5%), and ColdU (N=1, 5%). Of male patients with CIndU, nine (45%) had CholU, six (30%) had SDerm, two (10%) had cold urticaria (ColdU), two (10%) had DPU, and one (5%) patient was diagnosed as combined CIndU. Twenty (43.5%) of the female CU patients were on antihistamines, while 24 (52.2%) were on omalizumab. Twenty-one (45.7%) male CU patients were on antihistamines, while 24 were on omalizumab.

Sexual dysfunction in females and erectile dysfunction in males with CIndU and CSU were more prevalent than in controls: Female patients with CIndU and CSU had a higher prevalence of SD than controls (70% vs 20%; P <0.001; 83.3% vs 20%; P <0.001) (Figure 1). Overall scores of FSFI and all subdomains were found to be lower in both the CSU and CIndU groups than in the control group (P <0.05 for all) (Table 1, Figure 2). The presence of SD and overall FSFI and subdomain scores were found to be similar between the female CIndU and CSU patients (P >0.05). SD was more prevalent in females with CU than in controls (78% vs 20%; P <0.001) (Table 1).

Patients with CSU had a higher prevalence of ED than controls (43.3% vs 10%; P = 0.004) (Figure 1). Overall score of IIEF, score of erectile functions, sexual desire, and orgasmic functions were found to be lower in CSU group than in the control group (P = 0.005; P = 0.001; 0.004; P = <0.001, respectively) (Figure 3). Scores of intercourse and overall satisfaction were similar between patients with CSU and the control group (P >0.05). Despite the fact that the frequency of ED was similar between CSU and CIndU patients (43.3% vs 50%; P = 0.643), ED was found to be more prevalent in patients with CIndU than in controls (50% vs 10%; P = 0.002). The overall IIEF score, sexual desire, intercourse, and overall satisfaction were found to be similar between patients with CIndU and controls (P >0.05) (Figure 3), although erectile and orgasmic function scores of CIndU patients were lower than those of controls (P = 0.041; P = 0.02) (Table 2). ED in males was more prevalent in patients with CU than in controls (46% vs 10%; P <0.001).

Symptomatic dermographism in females and cholinergic urticaria in males impair sexual function: SD was found to be more prevalent in female patients with symptomatic dermographism (SDerm) than in the control group (76.9% vs 20%; P = 0.001). Patients with SDerm (no. 13) had lower overall FSFI scores and lower subdomain scores than controls (P <0.05) (Figure 4). In female patients, two out of three patients (66.7%) with DPU had SD, one out of two patients with CholU and one patient with cold urticaria (100%) had SD, while patients with heat urticaria had no SD.

When IIEF and subdomain scores of patients with CholU and SDerm were compared with controls, male patients with CholU had lower overall score, erectile function score, and orgasmic function score than the control group (P = 0.007; P = 0.003; P = 0.012) (Figure 5). CholU patients had higher prevalence of ED than controls (66.7% vs 10%; P = 0.002). Scores of IIEF subdomains as well as the prevalence of ED (16.7% vs 10%) were similar between patients with SDerm and the control group (p>0.05, for all). Both ColdU patients and 50% of DPU had ED, while a patient with combined CIndU had no ED.

Beck-D score, disease duration, and DLQI correlated with sexual functioning in female patients with CU: Overall FSFI correlated moderately with Beck-D score (no. 50, r=-0.469; P = 0.001), disease duration (r=-0.368; P = 0.009), and DLQI (r=-0.358; P = 0.011). UCT moderately correlated specifically with arousal subdomain (r=0.313; P = 0.027). Longer disease duration was correlated with impaired arousal, lubrication, and satisfaction subdomains in CU (r=-0.512; P <0.001; r=-0,303; P = 0.033; r=-0.325; P = 0.021).

For CSU, overall FSFI correlated with Beck-D score (r=-0.406; P = 0.026) and disease duration (r=-0.450; P = 0.013). Disease duration correlated with arousal (r=-0.519; P = 0.003), lubrication (r=-0.419; P = 0.021), and satisfaction scores (r=-0.452; P = 0.012). For CIndU, overall FSFI correlated with Beck-D score (r=-0.509; P = 0.022).

IIEF scores correlated negatively with Beck-D score and higher disease activity impaired orgasmic functions in male CSU patients: A higher Beck-D score was associated with moderately impaired total IIEF score, erectile functions, and overall satisfaction in patients with CU (IIEF r=-0.334; P = 0.018; erectile function score; r=-0.313; P = 0.027; overall satisfaction; r=-0.353; P = 0.012).

Table 1. Patient Characteristics, Disease Activity, Control, QoL, Beck-D and FSFI Scores, and Subdomain Scores of Female Patients with CU Subtypes and Control Group.

Females	CU (N=50)	Control (N=30)	CSU (N=30)	CIndU (N=20)	p
Age (years) mean±sd (median) min-max	36.06 ±5.37 (36) 24-45	34.37±5.66 (33) 24-44	36.37±6.06 (37.5) 24-45	35.6±4.23 (35) 27-45	**0.331**[a]
Disease duration (months) mean±sd (median) min-max	84.32±90.36 (60) 3-420	-	64.77±70.28 (42) 3-240	113.65±109.6 (72) 5-420	**0.034***
Accompanying angioedema n, %	26 (54.2%)	-	20 (71.4%)	6 (30%)	**0.005***
UAS7 mean±sd (median) min-max	17.03±11.45 (14.5) 2-38	-	17.03±11.45 (14.5) 2-38	-	-
UCT mean±sd (median) min-max	7.96±4.35 (8) 0-16	-	8.5±4.61 (8.5) 0-16	7.15±3.90 (7) 0-14	**0.326***
DLQI mean±sd (median) min-max	12.16±7.93 (10.5) 1-29	-	12.23±8.22 (10.5) 1-29	12.05±7.68 (10.5) 1-26	**1.000***
Beck-D score mean±sd (median)	13.72±8.97 (12) 0-35	5.33±3.68 (7) 0-12	13.83±9.31 (12) 0-32	13.5±8.66 (12.5) 2-35	**<0.001**** **<0.001*****
Patients with depressive symptoms n, %	16 (32%)	0	10 (33.3%)	6 (30%)	**0.001**** **0.002*****
Sexual dysfunction (overall FSFI score 26 or less)	39 (78%)	6 (20%)	25 (83.3%)	14 (70%)	**0.311*** **<0.001**** **<0.001*****
Overall FSFI score mean±sd (median) min-max	21.06±7.28 (23.4) 3.60-34	29.73±3.40 (30.75) 22-36	22.07±5.87 (23.35) 3.6-34	19.55±8.94 (23.9) 3.60-31.2	**0.677*** **<0.001**** **<0.001*****
Desire mean±sd (median) min-max	3.23±1.10 (3.3) 1.20-5.4	4.08±0.84 (4.2) 2.4-6	3.34±0.97 (3.30) 1.20-5.40	3.06±1.3 (3.30) 1.20-5.40	**0.498*** **0.002**** **0.003*****
Arousal mean±sd (median) min-max	2.86±1.38 (3) 0-5.8	4.86±0.76 (5.10) 2.70-6	3.15±1.29 (3.30) 0-5.80	2.43±1.42 (2.55) 0-5.20	**0.082*** **<0.001**** **<0.001*****
Lubrication mean±sd (median) min-max	3.88±1.51 (3.9) 0-6	5.03±0.93 (5.30) 3.60-6	3.96±1.33 (3.90) 0-6	3.75±1.78 (4.35) 0-6	**0.992*** **0.001**** **0.006*****
Orgasm mean±sd (median) min-max	3.74±1.55 (4) 0-6	5.17±0.69 (5.20) 3.20-6	4±1.12 (4.20) 0-5.6	3.34±2.00 (14) 0-6	**0.430*** **<0.001**** **<0.001*****
Satisfaction mean±sd (median) min-max	3.62±1.66 (4.6) 0-5.2	5.21±0.65 (4.8) 3.6-6	3.89±1.33 (4.8) 0-5.20	3.22±2.04 (4.20) 0-5.20	**0.447*** **<0.001**** **<0.001*****
Pain mean±sd (median) min-max	7.73±1.94 (3.6) 0-6	5.37±1.03 (6) 2.40-6	3.72±1.75 (3.6) 0-6	3.74±2.25 (4.40) 0-6	**0.682*** **<0.001**** **0.005*****

[a] p for CSU, CIndU, control (Kruskal Wallis); * p for CSU vs CIndU; ** p for CSU vs controls; *** p for CIndU vs controls.
Abbreviations: BECK-D: Beck Depression Inventory; CIndU: chronic inducible urticaria; CSU: chronic spontaneous urticaria; CU: chronic urticaria; DLQI: Dermatology Life Quality Index; FSFI: Female Sexual Function Index; SD: sexual dysfunction; UAS: Urticaria Activity Score 7; UCT: urticaria control test.

Table 2. Patient Characteristics, Disease Activity, Control, QoL, Beck-D and IIEF Scores, and Subdomain Scores of Male Patients with CU Subtypes and Control Group.

Males	CU (N=50)	Control (N=30)	CSU (N=30)	CIndU (N=20)	p
Age (years) mean±sd (median) min-max	32.28±7.73 (33) 18-45	30.56±4.88 (30) 24-43	33.66±7.80 (34) 18-45	32.70±7.79 (32) 18-45	**0.166**[a]
Disease duration (months) mean±sd (median) min-max	48.80±39.68 (48) 4-180	-	43.07±36.0 (45.5) 4-180	57.72±44.35 (48) 5-180	**0.239***
Accompanying angioedema n, %	21 (43.8%)	-	16 (57.1%)	5 (25%)	**0.027***
UAS7 mean±sd (median) min-max	14.73±9.31 (14) 2-38	-	14.73±9.31 (14) 2-38	-	
UCT mean±sd (median) min-max	9.76±3.66 (10) 0-16	-	9.16±3.78 (10) 0-16	10.65±3.36 (9.5) 4-16	**0.265***
DLQI mean±sd (median) min-max	7.18±5.94 (7) 0-25	-	7.03±5.72 (5.5) 0-21	7.4±6.41 (8) 0-25	**0.913***
Beck-D score mean±sd (median)	6.82±6.14 (5) 0-27	3.76±3.73 (3) 0-15	7.5±7.21 (5.5) 0-26	5.70±6.65 (3) 0-27	**0.345*** **0.035**** **0.523*****
Patients with depressive symptoms n, %	5 (6.2%)	0	4 (13.3%)	1(5%)	**0.636*** **0.112**** **0.4*****
IIEF Overall score mean±sd (median) min-max	55.56±17.24 (62.5) 4-75	66.10±5.80 (67) 44-73	53.73±18.17 (60) 4-74	58.30±15.78 (64.5) 15-75	**0.394*** **0.005**** **0.081*****
Erectile function mean±sd (median) min-max	22.44±8.40 (26.5) 4-30	28.23±2.25 (29) 21-30	21.97±8.72 (26.5) 4-30	23.15±8.06 (26.5) 4-30	**0.397*** **0.001**** **0.041*****
Erectile dysfunction score of erectile function <26 n, %	23 (46%)	3 (10%)	13 (43.3%)	10 (50%)	**0.643*** **0.004**** **0.002*****
Sexual desire mean±sd (median) min-max	9.5±4.54 (11) 0-15	11.73±1.89 (12) 6-14	8.87±4.66 (11) 0-15	10.45±4.28 (12) 0-15	**0.088*** **0.004**** **0.777*****
Orgasmic functions mean±sd (median) min-max	8.32±2.71 (9) 0-10	9.77±0.39 (10) 7-10	8±2.94 (9) 0-10	8.80±2.31 (10) 0-10	**0.188*** **<0.001**** **<0.02*****
Intercourse satisfaction mean±sd (median) min-max	7.4±2 (8) 0-10	7.70±1.09 (8) 6-10	7.27±2.18 (8) 0-10	7.60±1.73 (7) 3-10	**0.763*** **0.784**** **0.878*****
Overall satisfaction mean±sd (median) min-max	7.9±2.19 (8) 0-10	8.67±1.45 (9) 4-10	7.63±2.51 (8) 0-10	8.30±1.56 (8) 4-10	**0.501*** **0.124**** **0.366*****

[a] p for CSU, CIndU, control (Kruskal Wallis); * p for CSU, CIndU; ** p for CSU vs controls; *** p for CIndU vs controls.
Abbreviations: BECK-D: Beck Depression Inventory; CIndU: chronic inducible urticaria; CSU: chronic spontaneous urticaria; CU: chronic urticaria; DLQI: Dermatology Life Quality Index; IIEF: International Index of Erectile Function; sd: standard deviation; UAS: Urticaria Activity Score (UAS) 7; UCT: urticaria control test.

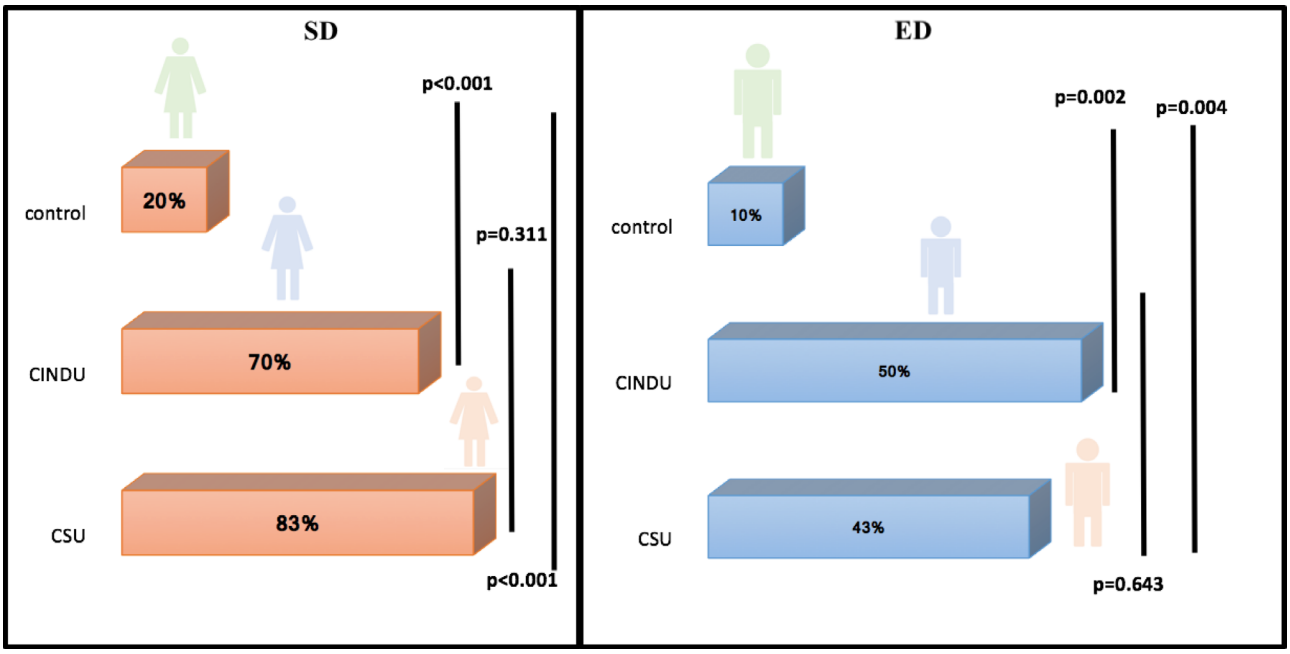

Figure 1. Sexual dysfunction (SD) in females and erectile dysfunction (ED) in males are more prevalent in patients with chronic inducible urticaria (CIndU) and chronic spontaneous urticaria (CSU) than in the controls.

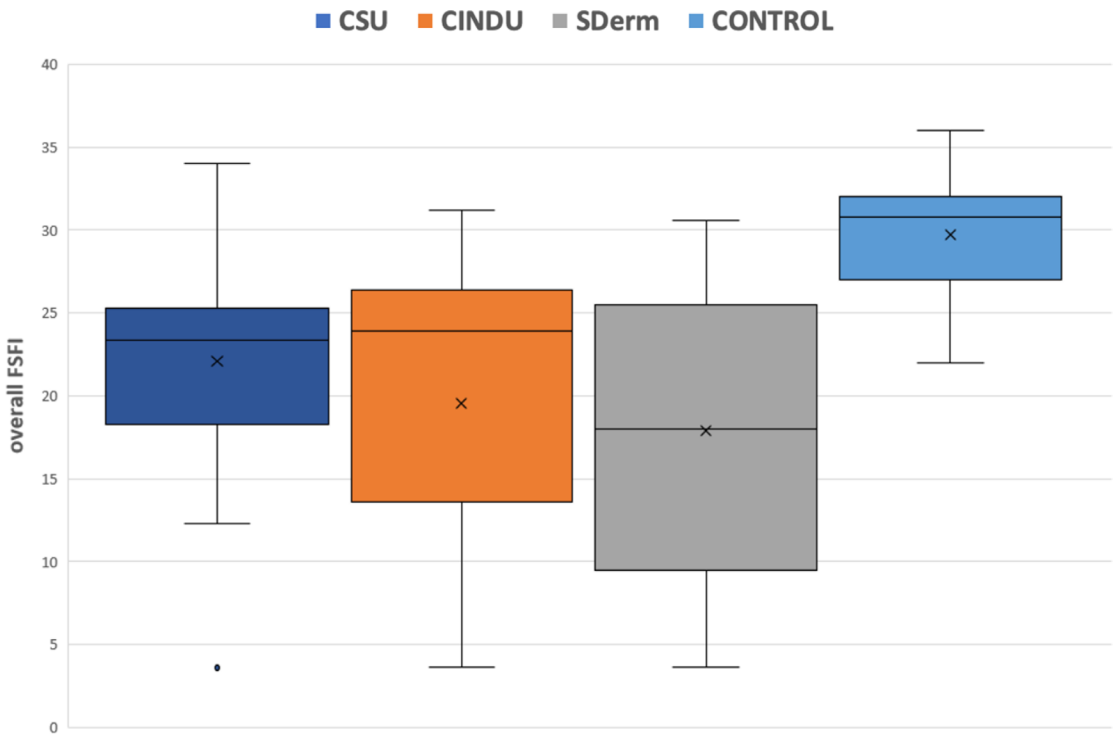

Figure 2. Overall Female Sexual Function Index (FSFI) score was found to be lower in both chronic spontaneous urticaria (CSU) and chronic inducible urticaria (CIndU) and in symptomatic dermographism (SDerm) group than in the control group (P <0.05).

For the CSU group, overall IIEF score correlated with Beck-D score (r=-0.374, P = 0.042). Only orgasmic functions had a moderate correlation with UAS7 (r=-0.364; P = 0.048). For the CIndU group, the IIEF score did not correlate with Beck-D score.

Disease Duration, Disease Control, Disease Activity (UAS7), and Beck-D Scores in Female CU Patients with Sexual Dysfunction: Disease duration (median 60 vs 18; P = 0.049) was longer, disease control (UCT; median 7 vs 10; P = 0.045) was poorer and Beck-D score (median 14 vs 8;

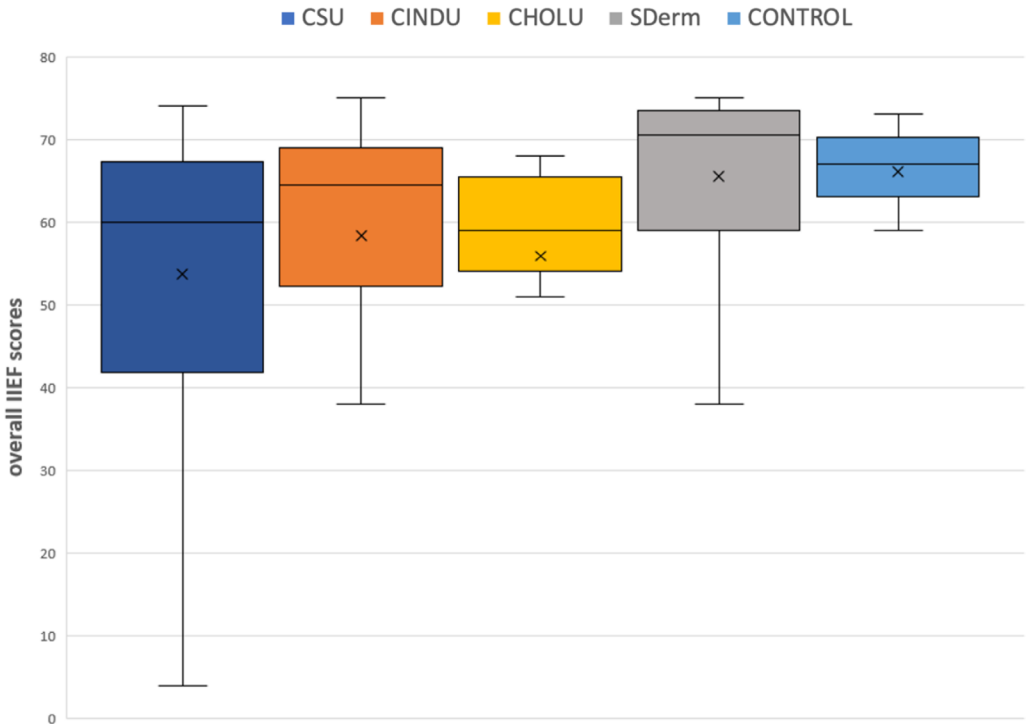

Figure 3. Overall International Index of Erectile Function (IIEF) score was found to be lower in both chronic spontaneous urticaria (CSU) and cholinergic urticaria (CholU) groups than in the control group (P = 0.005, P = 0.007).

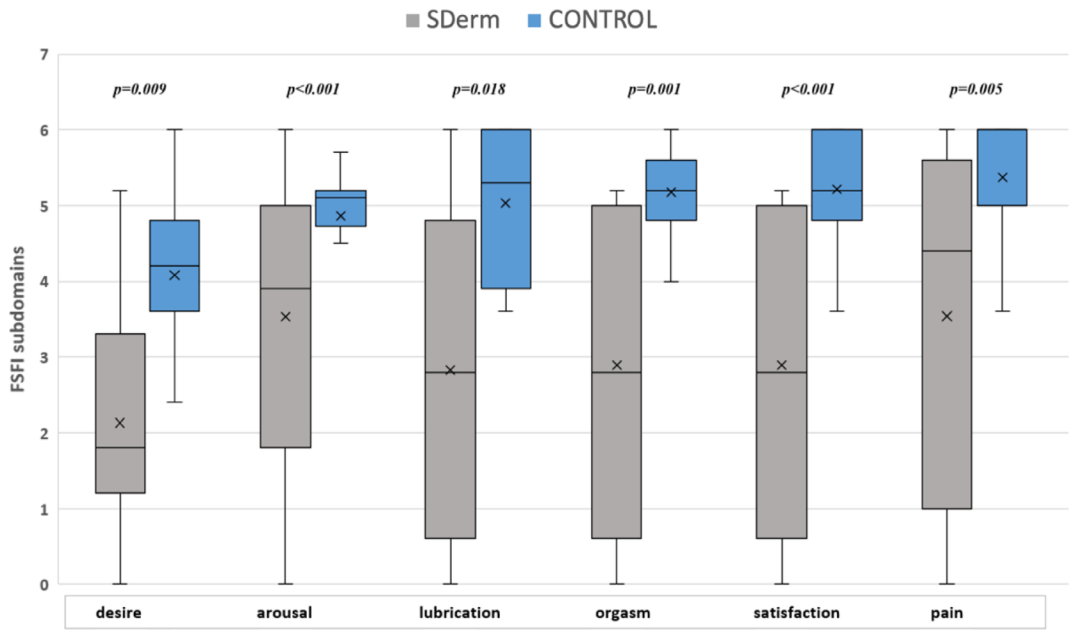

Figure 4. Patients with symptomatic dermographism (SDerm) had lower FSFI subdomain scores than the controls.

P = 0.009) was higher in the female group of CU with SD. Disease activity (UAS7) (median 17 vs 4; P = 0.013) was also found to be higher in female CSU patients with SD than in those without (Table 3).

Female vs Male Patients with CU: Quality of Life, Disease Control, and Depressive Symptoms: Age and disease duration were similar between females and males (P = 0.057; P = 0.092). DLQI and Beck-D scores were significantly higher and UCT was significantly lower in females with CU (P = 0.001; P <0.001; P = 0.028), while UAS7 was not different between female and male patients with CSU (P = 0.599). Female patients with CU had more depressive symptoms than males (32% vs 10%; P = 0.007) (Tables 1-2).

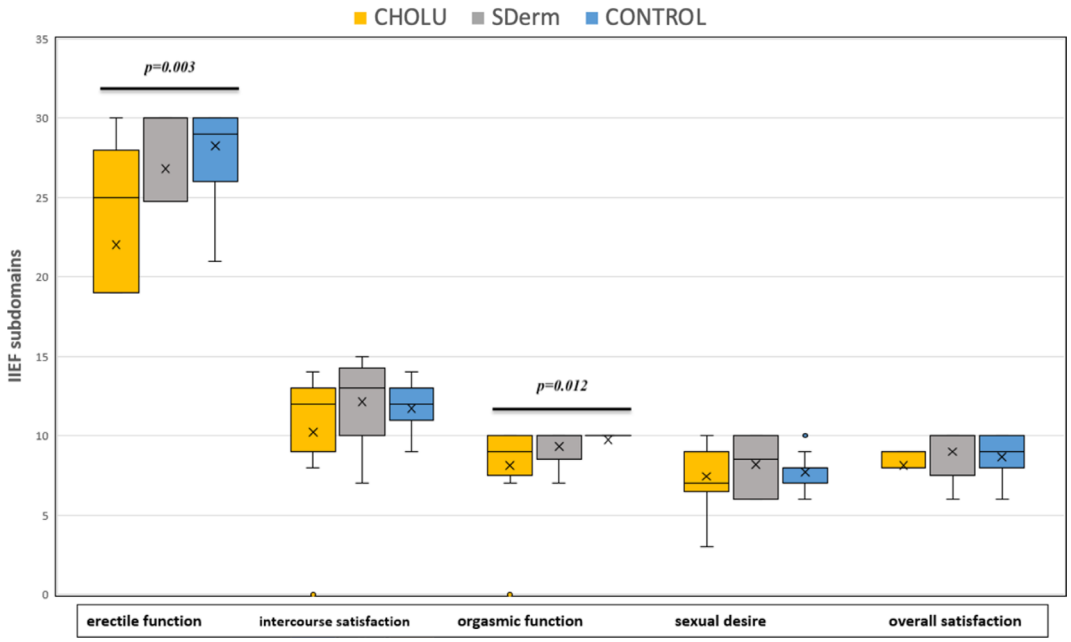

Figure 5. Male patients with cholinergic urticaria (CholU) had lower score of erectile function and orgasmic function than the control group. SDerm: symptomatic dermographism.

Table 3. Patient Characteristics, Disease Control, Disease Activity (UAS7), QoL, and Beck-D Scores in CU Patients With Erectile Dysfunction and Sexual Dysfunction.

	Male Patients With CU			Female Patients With CU		
	Patients with ED (N=23, 46%)	Patients without ED (N=27, 54%)	p	Patients with SD (N=39, 78%)	Patients without SD (n=11, 22%)	p
Age (years) mean±sd (median) min-max	31.13±8.14 (30) 18-44	35.11±6.99 (35) 19-45	0.052	36.23±5.57 (36) 24-45	35.45±4.78 (36) 29-43	0.639
Accompanying angioedema n, %	7 (31.8%)	14 (53.8%)	0.125	21 (56.8%)	5 (45.5%)	0.509
Disease duration (months) mean±sd (median) min-max	50.35±39.29 (48) 4-180	47.61±40.71 (45.5) 5-180	0.730	94.02±95.22 (60) 3-420	49.90±62.30 (18) 4-216	0.049*
UAS7 (only for CSU) mean±sd (median) min-max	14.92±8.14 (14) 5-30	14.58±10.36 (14) 2-38	0.690	19.2±11.21 (17) 2-38	6.20±4.66 (4) 2-13	0.013*
UCT mean±sd (median) min-max	10±3.19 (10) 3-16	9.5±4.06 (9) 0-16	0.625	7.30±4.33 (7) 0-16	10.27±3.69 (10) 4-16	0.045*
DLQI mean±sd (median) min-max	6.04±4.79 (4) 0-16	8.14±6.71 (7) 0-25	0.401	13.33±8.11 (11) 1-29	8±5.79 (6) 1-18	0.054
Beck-D score mean±sd (median) min-max	8.30±7.77 (6) 0-27	5.55±6.10 (4) 0-23	0.138	15.35±9.17 (14) 0-35	7.90±5.15 (8) 2-20	0.009*
Patients with depressive symptoms n, %	3 (13%)	2 (7.4%)	0.651	15 (38.5)	1 (9.1%)	0.08

Abbreviations: BECK-D: Beck-depression inventory; CIndU: chronic inducible urticaria; CSU: chronic spontaneous urticaria; CU: chronic urticaria; DLQI: Dermatology Life Quality Index; IIEF: International Index of Erectile Function; sd: standard deviation; UAS: Urticaria Activity Score (UAS) 7; UCT: urticaria control test.

Discussion

Our results show that two subtypes of CU have a substantial impact on patients' sexual function. SD has substantial effects on physical health, interpersonal relationships, and QoL [21]. Many chronic dermatological conditions, including psoriasis, atopic dermatitis, vitiligo, and acne inversa, have been reported to be associated with female SD and with ED [9,12]; 57.8% of CU patients reported that their sexual life was affected by the disease [22]. A recent study showed that patients with CU focus more on their bodies during sexual activity than does the control group, and they avoid sexual intercourse [23]. In our study group, the prevalence of female SD was 78% in CU patients, 83.3% in CSU, and 70% in the CIndU group, while it was only 20% in the control group. The prevalence of SD has been reported to be 70.5% in female CU patients [12]. While SD was reported in two thirds (67.9%) of female patients with CSU in a study, it was reported to be 52% in another study [14,24].

Skrzypulec-Frankel [13] and Ertaş et al. [14] showed that female patients with CSU had lower sexual function than controls by evaluating FSFI scores. We observed that patients with CSU and CIndU had significantly lower overall FSFI and subdomain scores than controls, which indicated that these patients had impaired sexual function (P <0.05, for all).

Patients with CU were reported by Sukan et al. [12] as having significantly more difficulties in sexual arousal, more difficulty attaining or maintaining vaginal lubrication-swelling response, and had more difficulty reaching orgasm than did controls (P <0.001). Furthermore, satisfaction from orgasm was less than that of controls. Skrzypulec-Frankel et al. [13] reported that only desire, arousal, orgasm, and satisfaction were impaired in female patients with CSU. Similar to our study, Ertaş et al. [14] reported that all subdomains of FSFI were affected in patients with CSU.

The frequency of ED in patients with CSU and CIndU was higher than in controls in our study (43% and 50% vs 10%; P = 0.004; P = 0.002), and ED in CU group was also found to be higher than in the control group (46% vs 10%; P = 0.001). In a controlled study, prevalence of male SD was reported to be 31.2% in patients with CU [12], and it was reported to be 63% in CSU patients in a cross-sectional study [24]. Males with CU have been reported to experience less satisfaction from orgasm than controls (P <0.001) [12]. Skrzypulec-Frankel et al. [13] showed that IIEF was significantly lower in CSU than that in the control group (64.28±5.1 vs. 67.63±4.25; P <0.05). In our study population, overall IIEF score, erectile function, sexual desire, and orgasmic function scores were lower in CSU patients compared to controls, which was similar to the findings of Skrzypulec-Frankel et al. [13].

In our study, CholU was the most common form of CIndU in males (45%), followed by SDerm (30%), whereas the most common type was SDerm in the female patients (65%). SD was found to be more prevalent in female patients with SDerm than in the control group. Patients with SDerm had lower overall FSFI and lower subdomain scores than controls. SDerm is characterized by the development of strip-shaped wheals and itching and/or burning within seconds to minutes following the shear force acting on the skin [25, 26]. Low QoL and friction caused by intercourse may be the reason of SD caused by SDerm. Male patients with CholU had lower mean overall IIEF score, scores of erectile functions, and orgasmic functions than the control group, and CholU patients had a higher prevalence of ED than controls (66.7% vs 10%). Emotions was the most affected domain in CholU-QoL [27]. Patients with CholU also prefer to avoid activities that will increase their body temperature and cause sweating; therefore, it is not surprising that those patients have lower sexual function, especially ED. Sexual intercourse has been documented as a triggering factor for inducible urticarias: one female with exercise-induced anaphylaxis CholU and a male with DPU [28].

Sexual function in females and males with CSU have been reported to be associated with disease activity (UAS7), control (UCT), quality of life and depressive symptoms [13,14, 29]. It has been shown that DLQI and UAS7 were negatively correlated and UCT positively correlated with FSFI-IIEF and subdomains in CSU patients [29]. In our study group, UAS7 seemed to be associated only with orgasmic functions in male patients with CSU, while it was found to be higher in female CSU patients with SD than in those without. In patients with CU, FSFI correlated significantly with DLQI and disease duration, although IIEF did not. In a recent study in patients with CSU, female SD, was reported to be associated with poorer QoL and an increased risk for anxiety (85%) and depression (90%) [13]. In our study, sexual function (overall FSFI and IIEF) was found to be correlated with Beck-D score in both sexes in patients with CU, CSU, and CIndU. However, this correlation was not observed in male patients with CIndU. Females with SD had higher Beck-D scores, indicating that depressive symptoms can be the assumed mechanism of SD in females. We found more significant results in female patients. The reason for this may be that female patients with CSU are more severely affected than are males in terms of QoL impairment [30]. Changes in body image affect females more than males, and it may affect their perception of being desired [31].

Limitations

The limitations of this study were that IIEF scoring provided superficial assessment of domains of sexual functioning

other than erection. Different subtypes of CIndU may have a substantial effect on sexual function, but a low number of patients with CIndU as well as a low number of healthy controls were included in the study. Another point is that we included patients who were undergoing omalizumab treatment, which has been shown to enhance sexual function in CSU patients (Durmaz et al. [32]).

Conclusion

The prevalence of ED in males and SD in females was high in patients with CSU and CIndU, whereas sexual functioning was affected similarly in both groups. Long disease duration and greater impairment in QoL were found to be associated with SD in females. Depressive symptoms in males and females with CU was associated with more reduced sexual functioning. CSU and CIndU may lead to sexual dysfunction in both sexes, particularly in female patients with depressive symptoms; more studies evaluating the association are needed.

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