Sexual Disorders in Women with Overactive Bladder and Urinary Stress Incontinence Compared to Controls: A Prospective Study

Sexuelle Funktionsstörungen bei Frauen mit überaktiver Blase und Belastungsharninkontinenz im Vergleich mit einer Kontrollgruppe: eine prospektive Studie

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ABSTRACT

Introduction and Hypothesis Female urinary incontinence (UI) has a negative impact on sexual function and sexual quality of life (QoL) in women. But there is still no consensus on the type of UI or the prevalence of sexual dysfunction (SD). The aim of the study was to evaluate sexual disorders in women with overactive bladder (OAB) compared to patients with urinary stress incontinence (SUI) and healthy controls.

Materials and Methods 106 women presenting to a urogynecological outpatient clinic (referral clinic) were investigated using standardized questionnaires and the Female Sexual Function Index (FSFI-d). All 65 incontinent women underwent a full urodynamic examination; the controls (31) were non-incontinent women in the same age range who came for routine check-ups or minor disorders not involving micturition or pelvic floor function. Women with mixed urinary incontinence, a history of previous medical or surgical treatment for UI, recurrent urinary tract infections, previous radiation therapy or pelvic organ prolapse of more than stage 2 on the Pelvic Organ Prolapse Quantification (POP-Q) system were excluded.

Results 100 questionnaires could be evaluated (94.3%). Thirty-four women had urinary stress incontinence, 35 had OAB, 31 were controls. Mean age was 56 years, with no significant differences between groups. The scores of the questionnaire ranged from 2 to 35.1 points. The median score of OAB patients was significantly lower (17.6) than the median score of the controls (26.5; p = 0,004). The stress-incontinent women had a score of 21.95, which was lower than that of the controls but statistically non-significant (p = 0.051). In all subdomains, the OAB patients had lower scores than the stress-in-

continent women and significantly lower values than the control group. Most striking was the impairment of "sexual interest in the last 4 weeks". The figure for "none or almost no sexual activity" was 80 % for the OAB group, 64.7 % for the group of stress-incontinent women and 48 % for the control group. Incontinence during intercourse was reported by one OAB patient and 4 stress-incontinent women but did not occur in the control group.

Conclusions There is a high prevalence of SD in women with urinary incontinence. Patients with OAB reported a greater negative impact on sexual function and had significantly lower scores for the FSFI questionnaire than patients with stress incontinence or controls.

ZUSAMMENFASSUNG

Einleitung und Hypothese Die weibliche Harninkontinenz wirkt sich negativ auf die Sexualfunktion und die sexuelle Lebensqualität von betroffenen Frauen aus. Aber es herrscht immer noch kein Konsens über die Auswirkungen der Art der Harninkontinenz auf die Prävalenz von sexuellen Funktionsstörungen. Ziel dieser Studie war es, sexuelle Funktionsstörungen bei Frauen mit überaktiver Blase zu evaluieren im Vergleich zu Patientinnen mit Stressharninkontinenz sowie einer gesunden Kontrollgruppe.

Material und Methoden 106 Frauen, die an eine urogynäkologische Ambulanz überwiesen wurden, wurden mithilfe standardisierter Fragebögen und der deutschsprachigen Fassung des Female Sexual Function Index (FSFI-d) untersucht. Bei allen 65 inkontinenten Frauen wurde eine vollständige urodynamische Untersuchung durchgeführt, die Kontrollgruppe (31) bestand aus nicht inkontinenten Frauen desselben Alters, die sich wegen einer Routineuntersuchung oder kleineren Beschwerden, die nicht im Zusammenhang mit Harnentleerung oder Beckenbodenfunktion standen, vorstellig wurden. Frauen mit gemischter Harninkontinenz, medizinischen oder chirurgischen Inkontinenzbehandlungen in der Anamnese, wiederholten Harntraktinfekten, einer früheren Radiotherapie oder einem Beckenorganvorfall von mehr als Stadium II (bewertet mit dem [POP-Q] Beckenorgan-Prolaps-Quantifizierungssystem) wurden nicht in die Studie aufgenommen.

Ergebnisse Es konnten insgesamt 100 Fragebogen evaluiert werden (94,3 %). 34 Frauen litten an Belastungsharninkontinenz, 35 hatte eine überaktive Blase/Dranginkontinenz, 31 Frauen dienten als Kontrollgruppe. Das mittlere Alter betrug 56 Jahre, und es gab keine signifikanten Unterschiede zwischen den Gruppen. Die erzielte Punktzahl für den Fragenbogen reichte von 2 bis 35,1 Punkten. Die Durchschnittswerte der Patientinnen mit überaktiver Blase waren signifikant niedriger (17,6) als die durchschnittliche Punktzahl der Kontrollgruppe (26,5; p = 0,004). Die Punktzahl der Gruppe mit Belastungsharninkontinenz betrug 21,95, was auffällig war im Vergleich zur Kontrollgruppe. Trotzdem war dieser Unterschied nicht statistisch signifikant (p = 0,051). Patientinnen mit überaktiver Blase wiesen in allen Teilbereichen geringere Werte als Frauen mit Belastungsharninkontinenz und signifikant niedrigere Werte als die Kontrollgruppe auf. Am auffälligsten war die Beeinträchtigung von „sexuellem Interesse in den vergangenen 4 Wochen": 80 % der Patientinnen kreuzten „keine oder fast keine sexuelle Aktivitäten" an, bei Frauen mit Belastungsharninkontinenz waren es 64,7 % und bei der Kontrollgruppe 48 %. Eine Patientin mit überaktiver Blase und 4 der Frauen mit Belastungsharninkontinenz, aber keine der Frauen in der Kontrollgruppe vermeldeten Inkontinenz während des Geschlechtsverkehrs.

Schlussfolgerungen Obwohl es eine hohe Prävalenz an sexuellen Funktionsstörungen bei Frauen mit Harninkontinenz gab, wiesen Patientinnen mit überaktiver Blase eine stärkere negative Auswirkung auf die Sexualfunktion auf und hatten signifikant niedrigere Werte beim FSFI-Fragenbogen als Frauen mit Belastungsharninkontinenz oder Frauen aus der Kontrollgruppe.

Brief Summary

OAB patients had significantly lower scores for the FSFI questionnaire in general and in all subdomains compared to stress-incontinent women and controls.

Introduction

Many publications have reported impairments in the sexual life of women with urinary incontinence. Most of these publications are studies on sexual function after urinary stress incontinence operations [1, 2]. The most common cause of preoperative sexual dysfunction is coital incontinence. More than 40 % of women with urinary stress incontinence report that this interferes with their sexual function. The prevalence of coital incontinence is reported to be between 24–31 % [3]. It is important to distinguish between urinary loss during penetration and during orgasm. The former is mostly due to urinary stress incontinence [4], the latter is mostly associated with overactivity of the detrusor muscle [5].

Barber et al. reported that 22 % of incontinent women had decreased sexual function and a reduction in libido caused by the fear of incontinence during intercourse or orgasm [6]. Sutherst and Brown found that 43 % of women reported an adverse effect of incontinence on their sexual relations [7]. Other studies also report reduced lubrication and dyspareunia in incontinent women [8]. Women with sexual complaints report more pelvic floor disorders [9].

Rogers et al. reported libido reduction, arousal problems, disturbance of orgasm and dyspareunia in 46 % of incontinent patients [10]. Korda and colleagues interviewed 4000 women between the ages of 19 and 82 about the impact of urinary incontinence on their sexual life. 46.5 % of the incontinent women below the age of 50 reported decreased sexual arousal. This difference was not seen in older women (> 50 years old) [9].

A recent study by Gomes et al. showed a high prevalence of SD in women with urinary incontinence, irrespective of the type of UI. The greater the severity of UI, the worse the FSFI sexuality questionnaire scores [11].

▶ **Table 1** FSFI domain scores and full-scale score [17].

Domain	Questions	Score range	Factor	Minimum score	Maximum score
Sexual interest	1, 2	1–5	0.6	1.2	6.0
Arousal	3, 4, 5, 6	0–5	0.3	0	6.0
Lubrication	7, 8, 9, 10	0–5	0.3	0	6.0
Orgasm	11, 12, 13	0–5	0.4	0	6.0
Satisfaction	14, 15, 16	0 (or 1) –5	0.4	0.8	6.0
Pain	17, 18, 19	0–5	0.4	0	6.0
	Full-scale score range			2.0	36

FSFI: Female Sexual Function Index

There are only a few reports about a correlation between OAB and sexual function. Asoglu et al. reported more anxiety disorders and a reduced quality of life in women with OAB compared to women with urinary stress incontinence [12]. A Norwegian study by Bo et al. found that women with mixed incontinence reported greater levels of sexual dysfunction than those with stress incontinence alone [13]. Coyne et al. investigated 43 women with OAB, the majority of whom were incontinent OAB-patients (n = 23), who reported a reduction in their sexual interest. All of them reported a negative impact on their sexual life and difficulties in reaching orgasm [14].

The aim of our study was to investigate the prevalence of sexual dysfunction in women with OAB and urinary stress incontinence in patients presenting to the urogynecological outpatient clinic of our pelvic floor center. which has a high incidence of patients with sexual disorders due to OAB.

Materials and Methods

Study cohort

In this prospective cohort study, patients presenting to our outpatient clinic between 2016 and 2018 for urogynecological examination were enrolled in the study. A total of 106 women were included in the study and were divided into the following groups: stress incontinence alone (n = 34), overactive bladder alone (n = 35) and continent women presenting for routine check-ups or minor non-urogynecological disorders as the controls (n = 31). Six refused to complete the questionnaire. We enrolled sequential patients in the OAB group. As these patients were the rarest, other patients were included based on the number of included OAB-patients to prevent a time shift.

Exclusion criteria were: prolapse (> stage 1) or previous pelvic floor operations or incomplete clinical examination. Patients with OAB and SUI who had not had prior medical therapy for urinary incontinence were included. Psychiatric patients and patients with severe diseases which could impede sexual function were excluded. Women with chronic pelvic pain and those who reported pelvic pain during examination were also excluded from the study.

All incontinent women underwent a full urodynamic examination [15] with

- urogynecological history including
  - micturition symptoms
  - micturition chart
  - sexual history
  - bowel symptoms
- gynecological status including POPQ
- hormonal status based on vaginal smear
- urodynamic examination (urethrocystometry with stress test in supine and standing positions)
- 3-/4-D pelvic floor sonography

The information was recorded using a standardized, non-validated log and included a micturition log of at least 48 hours.

Stress incontinence was defined as the loss of urine in the absence of a detrusor contraction without any symptom of overactive bladder. Overactive bladder was diagnosed based on the ICS definition: urgency and/or frequency in the absence of any other detectable bladder disease. All patients with overactive bladder included in this study suffered from incontinence (incontinent OAB). Patients with mixed incontinence, including those with a previous history of stress incontinence surgery or medical treatment for incontinence within the last six months, were excluded.

Questionnaire analysis

Sexual history was recorded using the validated German-language "Female Sexual Function Index" (FSFI-d) questionnaire following informed consent. The questionnaire, developed by Rosen [16], was validated in German by Berner [17] and is the sole questionnaire in German which assesses female sexual function. It records the last four weeks of sexual activity for the domains: libido, sexual arousal, lubrication, orgasm, emotional satisfaction, and painful sensations. Each question has 5 possible answers rated with a maximum of 5 points which are linked to a special factor ranking for the different domains. Each of the six domains studied can be validated with a maximum score of six. A total score of between 0 and 36 is possible (▶ **Table 1**).

Individual domain scores and full-scale FSFI scores were obtained using a computational formula. Individual domain scores were obtained by adding the scores of individual items compris-

▶ **Table 2** Mean scores for sexual function domains of the FSFI according to UI type for 100 women included in the study.

Domain	OAB n = 35 Median [IQR]	SUI n = 34 Median [IQR]	Control n = 31 Median [IQR]	p value
Total score	17.6 [4,8; 27.3]	22.0 [5.7; 29.0]	26.5 [21.8; 30.5]	0.010
Sexual interest	2.3 [1.2; 3.0]	3.2 [2.3; 3.6]	3.4 [2.8; 3.6]	0.024
Arousal	2.7 [0.3; 3.9]	3.2 [1.0; 4.6]	3.9 [2.7; 4.8]	0.030
Lubrication	3.3 [0.0; 5.4]	3.8 [0.0; 5.8]	4.8 [3.9; 6.0]	0.046
Orgasm	2.8 [0.0; 4.8]	3.8 [0.0; 5.3]	4.8 [3.6; 5.6]	0.014
Satisfaction	3.6 [2.4; 4.8]	3.8 [2.4; 5.2]	4.8 [3.2; 5.6]	0.046
Pain	3.2 [0.0; 6.0]	3.8 [0.0;6.0]	6.0 [4.8; 6.0]	0.010

n: number of women, SD: standard deviation, OAB: overactive bladder, SUI: stress urinary incontinence, FSFI: Female Sexual Function Index
sig.: $p < 0.05$

ing the domain and multiplying the sum by the domain factor. The full-scale score was obtained by adding the six domain scores. The score correlates positively with sexual function.

The FSFI-d allows us to discriminate between "sexual dysfunction" and "no sexual dysfunction", with a threshold value of 26.55 considered optimal [18].

In 2000, Rosen et al. published a study of healthy women with a score of 30.5 ± 5.29 [16]. Communal et al. defined sexual function as "good" when the score was 30–36, "moderate" when it was 23–29 and "weak" when the score was below 23 [19].

Written consent was obtained from all patients who agreed to participate in the study. All patients signed a consent form.

Statistical methods

Statistical analysis was performed using the SPSS program, version 23.

We did not formally calculate a sample size because we had no pilot study for the groups to create data for a sample size calculation before this study. However, we estimated that recruiting 30 patients per group would provide enough preliminary data to reach a statistical power of 80% for the study, based on other studies comparing female sexual function in cases with different types of urinary incontinence [33].

Differences between the three groups were calculated with Mann-Whitney U-test. The results of explorative statistics were calculated with a significance of 5% ($p \leq 0.05$). Kruskal-Wallis test was used to compare sexual function domains and subtypes of UI and controls.

Results

The overall median age was 57.5 years (IQR 40.0; 64.75). Median age in the OAB group was 60.0 (25–75) years; in the SUI group it was 57.5 (30–76) years, and in the control group it was 54.0 (29–77) years (Kruskal-Wallis test: $p = 0.397$). There were no statistical differences between the different groups.

Total FSFI score

Overall, questionnaire scores ranged between 2 and 35.1 points (maximum: 36). The median score was 22.4. Women with OAB had a median score of 17.6, those with SUI had a median score of 22.0 and the control group had a score of 26.5 (▶ **Table 2**).

Variance analysis calculated with the Kruskal-Wallis test showed a highly significant difference of 0.01 between the total scores of the three groups. Mann-Whitney U-test showed no significant difference between the two groups with incontinence (OAB, SUI) ($p = 0.275$) but a noticeable difference of 4.55 points between stress-incontinent women and controls, although the difference was not statistically significant ($p = 0.051$). However, the difference between OAB patients and controls was highly significant ($p = 0.004$).

Categories/FSFI subgroups

Sexual interest

The subgroup "sexual interest" has two questions:

1. Over the past 4 weeks, how **often** did you feel sexual desire or interest?
2. Over the past 4 weeks, how would you rate your **level** (degree) of sexual desire or interest?

We found the OAB group had the lowest scores with 2.3, while stress-incontinent women scored 3.2 and controls scored 3.4. Mann-Whitney U-test showed no difference between controls and women with stress incontinence but a significant difference ($p = 0.046$) between OAB patients and stress-incontinent women and a highly significant difference between OAB patients and controls ($p = 0.001$).

Sexual arousal

Questions 3 to 6 of the FSFI-d concerned sexual arousal. Scores ranged from 0 to a maximum of 6.0 points.

Here again, the lowest median was found for the group of OAB patients (2.7), while the group of women with stress incontinence had a median of 3.2 and the control group had the highest score with 3.9; the differences were significant.

Mann-Whitney U-test showed a significant difference between the OAB group and the control group (p = 0.048) but not between the other groups (OAB/stress incontinence p = 0.522; stress incontinence/controls p = 0.212).

Lubrication

Questions 7–10 were on lubrication. The overall score in this subgroup ranged from 0.0 to 6.0. The highest score was for the control group (median value 4.8), while stress-incontinent women had a median value of 3.8 and women with OAB only had a score of 3.3. There was a significant difference between the OAB group and the control group (p = 0.018) but not between OAB/stress incontinence (p = 0.503) or stress incontinence/controls (p = 0.116).

Orgasm

Questions 11 to 13 of the FSFI focused on orgasm. The overall score was the same as that for the subgroups "lubrication" and "arousal". The OAB group had a median score of 2.8, patients with stress incontinence scored 3.8, and controls scored 4.8. There was a highly significant difference between the OAB group and controls (p = 0.006) but not between the stress-incontinent women and controls (p = 0.062) and between incontinent groups (p = 0.402).

Satisfaction

This area was covered by questions 14–16, with scores ranging from 0.8 to 6.0. Satisfaction had higher scores compared to other domains (OAB 3.6; SUI 3.8; controls 4.8). The difference between the OAB group and the control group was highly significant (p = 0.014) but comparisons between other groups were not.

Pain

Questions 17–19 focused on pain during intercourse, with the same scores are reported above. Here, the difference between the OAB group and controls (p = 0.008) was highly significant and the difference between stress-incontinent women and controls (p = 0.01) was also significant but not the difference between women with OAB and women with stress incontinence (p = 0.828).

We found significant differences between the OAB group and the control group in the FSFI-d scores for sexual function in all subgroups of this domain. This was most evident for the category "sexual interest" (p = 0.001) (▶ **Table 2**).

There was also a significant difference between OAB patients and the stress-incontinence group in this subgroup. Patients with urinary stress incontinence only differed significantly from controls in the domain "pain" (p = 0.01).

Particular questions in the FSFI

80 % of women with OAB responded to Question 1: "Over the past 4 weeks, how **often** did you feel sexual desire or interest?" with "A few times (less than half the time)" or "Almost never or never". 64.7 % of respondents in the group with stress incontinence and 48.4 % of patients in the control group also gave these answers.

In response to Question 2: "Over the past four weeks, how would you rate your level (degree) of sexual interest?", 74 % of the OAB group answered "low" or "very low or none at all", 17.1 % replied "moderate" and only 8.6 % answered "high", but none of them answered "very high". Patients with stress incontinence rated their sexual desire higher: almost half of them answered "low" or "very low or none at all", 41.2 % answered "moderate", and 8.8 % "high" or "very high".

One of the 21 sexually active patients with OAB and 4 of 22 patients with SUI reported involuntary loss of urine during intercourse (controls n = 0/28).

Discussion

Patients with pelvic floor disorders show reduced sexual well-being. The median age in our study was 57.7 years, demonstrating the late onset of a diagnosis of incontinence in the higher age groups, although younger women also suffer from this complaint. The age distribution was similar in all three groups.

Due to the higher mean age, the level of sexual disorder was higher; only 37 out of 100 participants achieved a total score of more than 26.55, which is the level of normal sexual function [18]. Women in all of the groups were matched according to age.

Assessment of the questionnaires

Contradictory or divergent results were seen when evaluating the different questions. One possible answer to Questions 3 to 14 and 17 to 19 was "no sexual activity". But this answer was not often given in response to these particular questions. In the control group, this possible answer was given in 12.9 to 16.1 % of cases; it was given in 26.5–32.4 % of cases in the group with urinary stress incontinence, and in 20.0–40.0 % of cases in the group of OAB patients. Although the questionnaire was suitable for women without sexual activity (due to the lack of a partner), some questions were confusing for a number of patients and some forms were therefore answered inaccurately.

Very often the answer to Question 15 "Over the past 4 weeks, how **satisfied** have you been with your sexual relationship with your partner?" was not completed, mostly in cases when women did not have a partner, because there was no possible answer apart from "no sexual activity". We added this question when interviewing the patient.

Many studies [1 – 3, 20] have shown the impact of urinary stress incontinence on sexual function. Our results also show an impact but found no significant difference between continent women and those with urinary stress incontinence. Only a few studies have reported a correlation between OAB and sexual dysfunction [21 – 24]. In our study, we found that women with OAB are significantly more likely to have sexual dysfunction than continent women, based on the total scores for the questionnaire (p = 0.004). Women with urinary stress incontinence had lower scores than healthy subjects, but this difference was not significant (p = 0.051).

In the analysis of all subgroups, patients with OAB reported a significant negative impact compared to controls, while comparisons of the SUI group with control patients and of the OAB/SUI groups did show any significant differences. The results of this study support the higher negative impact of OAB on sexual life.

Wiegel et al. [18] determined the threshold value of the FSFI-d questionnaire to be 26.55 points as an indication of some degree of sexual dysfunction. Based on this, in our study 71.4% of the OAB group, 67.6% of the urinary stress-incontinent patients, and 48.4% of controls showed some sexual dysfunction. This seems to be very high in our opinion. Communal et al. [19] defined less than 23 points as dysfunctional. In this case, 62.9% of the OAB group, 58.8% of the urinary stress-incontinent patients, and 35.5% of the controls had sexual dysfunction.

As regards the different domains of the questionnaire (sexual interest, arousal, lubrication, orgasm, satisfaction) we found a significant difference between OAB and controls for all of the domains.

Our study showed statistical differences in sexual interest between OAB and controls and OAB/SUI patients. These findings correlate with those of other studies: Coyne et al. [14] reported reduced sexual interest in half of OAB-patients. Gordon et al. [20] noted sexual dysfunction in 71% of OAB-patients. Coyne reported reduced sexual interest in more than half of incontinent patients and a negative impact of OAB on the sexual life of these patients, including difficulties in reaching orgasm [14]. The reduction of sexual interest was particularly noticeable in our study. 80% of our patients with OAB answered the question about the frequency of sexual interest with "sometimes (about half the time)", "a few times (less than half the time)" or even "almost never or never". 64.7% of the group of stress-incontinent women and 48.4% of the control group gave the same response. The degree of sexual interest question was also answered with "low" or "very low or none at all" by 74.4% of OAB-patients.

A similar picture was also seen for the category "arousal", with the OAB group showing significantly lower values and a median of 2.70 compared to controls which had a median of 3.90 ($p = 0.048$). The control group had better results than the group of women with urinary stress incontinence, but the difference between the two groups was not significant.

Disturbances of orgasm in women with incontinence has been reported in several studies [3, 25, 26]. We found a significant difference between the OAB group and the healthy group ($p = 0.006$), but no significant difference between stress-incontinent and continent women ($p = 0.062$).

Handa et al. [8] reported a reduction of libido in women with incontinence as well as reduced lubrication and increased dyspareunia. We also found a significant difference between the OAB group and controls ($p = 0.018$), but no statistically significant difference between the other two groups. Our results were similar to the findings of Handa et al. in terms of pain during intercourse and dyspareunia. In our study, there was a significant difference between controls and women with urinary stress incontinence but almost no difference between OAB women and stress-incontinent women ($p = 0.828$). What was notable was that the difference between stress-incontinent women and controls for the subgroup "pain" was significant, but the difference for the total score and other domains was not. This could be explained by anatomical changes in these women.

There was also a significant difference between OAB-patients and continent women ($p = 0.0149$) but not between the other groups for the domain "satisfaction". The low scores of patients with OAB can be explained by the high prevalence of sexual inactivity in this group.

Sexual inactivity

34% of OAB patients and 29% of the stress-incontinent group but only 14% of the continent women reported being sexually inactive. One of the weaknesses of this questionnaire is the lack of differentiation between cohabitation with a partner and masturbation without a partner. Sometimes older women were not able to answer all of the questions accurately.

Incontinence during intercourse

While other studies have reported a loss of urine during intercourse in 24–35% [20, 27], only 15% of stress-incontinent patients, one patient with OAB and none of the continent women reported this symptom in our study.

Barber et al. [4] differentiated between loss of urine during penetration and incontinence during orgasm. Our questionnaire did not differentiate between the two.

Arousal, lubrication, orgasm, and satisfaction

40% of the OAB patients reported achieving orgasm without or only with little difficulty, as did 47% of women with urinary stress incontinence and 67% of the continent women. 25% of the OAB group said they found it impossible or very difficult to achieve orgasm. But this figure was very similar across all the groups: 23.5% of the stress-incontinent group and 19.3% of the continent women reported the same problem.

"Discomfort and pain" was the only subgroup where the values of OAB patients were better than those of the stress-incontinent women (18% versus 12% in OAB patients); only 3% of healthy women reported discomfort and pain. One reason for this could be anatomical changes in women with pelvic floor weakness.

It is not clear whether OAB impairs sexual life or vice versa, or if there is a common cause. The FSFI-d questionnaire only asks about the last four weeks of sexual activity, so we have no definite knowledge about the period of incontinence or about the disturbance of sexual function. In our experience, women who are sexually inactive in their partnership report this some years before the onset of OAB. But this should be clarified by further studies.

Studies report an impact of OAB symptoms on sexual function and that OAB itself is often correlated with psychosomatic disease [5, 20, 28]. Women with OAB suffer more often from depression and anxiety disorders than those with urinary stress incontinence [28 – 30].

A recent study has shown that after one year, about 18% of women with urinary stress incontinence develop combined stress/urge incontinence [31]. MRI studies have shown that women with OAB show activity in other brain regions in relation to urinary urgency than healthy controls, indicating a recruitment of alternative pathways when loss of bladder control is feared. In fact, we all train our brain to control two reflexes which are not under the control of our senses, i.e., micturition and defecation [32]. The regulation of sexual reflexes occurs later in life and possibly follows similar pathways to those of micturition, targeting the same organ system. This could explain the fact that disorders in both systems are significantly often found together. It would be

of interest to see whether our clinical observation that disturbances of sexual function appear years before OAB symptoms can be verified, as this hypothesis could offer a new approach for the therapy of OAB and of sexual disorders.

Conclusion

OAB and stress urinary incontinence have a significant negative impact on sexual life.

There is a high prevalence of SD in women with urinary incontinence, irrespective of the type of UI. A higher degree of incontinence is related to lower FSFI scores.

When all FSFI domains were analyzed, patients with OAB had significant sexual dysfunction compared to controls. Comparisons between SUI and control patients and OAB/SUI did not show significant differences with the exception of sexual interest. The results of this study support a higher negative impact of OAB on sexual life. There are more differences between OAB patients and controls than between SUI patients and controls.

Further studies should focus more on the impact of OAB on sexual function.

Authors Contributions

Naumann: Project development, data collection, management data analysis, manuscript writing/editing.
Hitschold: Project development, management data analysis.
Frohnmeyer: Data collection, management data analysis.
Majinge: Project development, manuscript writing/editing.
Lange: Project development, data collection, management data analysis, manuscript writing/editing.

Conflict of Interest

Naumann: Promedon (research, travel expenses).
Frohnmayer, Majinge, Hitschold: The authors declare that they have no conflicts of interest.
Lange: coma urogyn GmbH (co-owner), contura (advisory board), Coloplast (travel expenses, speaker, research).

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