

Mixed incontinence is more bothersome than pure incontinence subtypes

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Abstract The purpose of the study was to compare incontinence bother in women with mixed incontinence versus pure incontinence subtypes. This is an institutional review board-approved study comparing physical exam findings and responses to the Medical Epidemiologic and Social Aspects of Aging (MESA) questionnaire and the Urinary Distress Inventory (UDI-6). The MESA responses were used to classify women as mixed, pure stress, or pure urge incontinence. This analysis includes 551 women with a mean age of 56 ± 16 years. Most women were Caucasian (86%) with 7% African American and 5% Hispanic. UDI scores were significantly higher in women with mixed incontinence (61 ± 23) than those with pure stress incontinence (40 ± 26) or pure urge incontinence (40 ± 25 ; $p < 0.0001$). Women with mixed incontinence report greater incontinence bother than women with either pure stress or urge incontinence.

Keywords Bother · Mixed incontinence · Quality of life · Stress incontinence · Urge incontinence

Introduction

Urge incontinence and its related symptoms pose a challenge to the management of women with concomitant stress urinary incontinence (SUI) symptoms. Mixed incontinence has been defined by the International Continence Society as “the complaint of involuntary leakage associated with urgency and also with exertion, effort, sneezing or coughing [1].” Epidemiologic studies have shown that the prevalence of mixed urinary incontinence ranges from 21% to 33% depending on the population studied. Multiple theories have been proposed for the etiology of mixed incontinence and how the components of stress and urge symptoms coexist and may even be continuums along a spectrum of incontinence severity. Mixed urinary incontinence (MUI) can be viewed as a combination of two separate conditions, SUI and urge urinary incontinence (UUI). As such, MUI is often harder to treat, as one must effectively manage two separate entities that often compete and exacerbate the symptoms and treatment efficacy of the other. Alternatively, Bump et al. proposed that MUI is actually a more severe form of SUI and/or UUI resulting in more severe incontinence symptoms rather than the result of two conditions [2].

The current International Continence Society definition is limited to patient-reported symptoms [1]; however, incontinence symptoms are not predictive of incontinence subtype when documented by urodynamic testing [2, 3]. These confounding clinical signs and symptoms combinations result in a diverse population of patients receiving the same diagnosis. Studies by Sandvik and Weidner have also shown that mixed symptoms tend to be more prevalent in clinical than in population-based epidemiologic studies [4, 5]. Epidemiological studies have shown that women with MUI symptoms typically have worse incontinence

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than women with pure SUI or UUI [4, 6]. The aim of this study was to determine if women with mixed incontinence experience greater bother from pelvic floor symptoms than women with pure stress or pure urge incontinence.

Materials and methods

After obtaining institutional review board approval, we reviewed consecutive charts of new patients presenting to our tertiary care referral practice from January 2003 to December 2004. Demographic information, pelvic organ prolapse stage, and responses to the Medical Epidemiologic and Social Aspects of Aging (MESA) questionnaire [7] and the Pelvic Floor Distress Inventory (PFDI) [8] were recorded. Women were separated into incontinence subtypes using responses on the MESA. Women were categorized as follows: pure SUI if they recorded any answer of “sometimes” or “often” on the MESA stress scale and all “never” or “rarely” on the urge scale, pure UUI if they recorded any answer of “sometimes” or “often” on the MESA urge scale and all “never” or “rarely” on the stress scale, and MUI if they recorded any “sometimes” or “often” on both the stress and urge scales.

Responses to the Urinary Distress Inventory (UDI-6), the urinary subscale of the PFDI, were scored from 0 to 100 according to standard scoring, with higher scores indicating more bother [8]. Responses to the subscales of the MESA were scored from 0 to 27, with higher scores indicating increased frequency of symptoms. Each individual question was scored based on the answer indicated. No points were given if the patient answered “never,” one point if the patient answered “rarely,” two points if the patient answered “sometimes,” and three points if the patient answered “often.” A total subscale score was then obtained by adding all individual questions.

Statistical analysis was completed using SPSS software version 13 (Chicago, IL, USA). Only women who had completed both questionnaires were included in this analysis. Spearman’s test was used to assess correlations between non-normal, noncategorical data. Mann–Whitney

and Kruskal–Wallis tests were used to compare median values of continuous variables. Kruskal–Wallis tested differences in the UDI scores and MESA subscale scores by the incontinence subtypes. To further elucidate the relationship between bother and frequency by incontinence subtype, Spearman’s correlations were done to compare MESA urge and stress subscale scores and corresponding answers to the UDI question 16 “do you usually experience urine leakage associated with a feeling of urgency that is a strong sensation of needing to go to the bathroom?” and question 17 “do you usually experience urine leakage related to coughing, sneezing, or laughing?” respectively. All tests were considered significant at a $p < 0.05$.

Results

The analysis included 551 women with a mean age of 56 ± 16 years and median parity of two children (range 0–8). Most women were Caucasian (86%) with 7% African American and 5% Hispanic. Forty-two percent of women had stage 0 prolapse, 19% stage I, 17% stage II, and 22% stage III or IV. Most women had MUI (347 [63%]), 117 women (21%) had pure SUI, and 87 women (16%) had pure UUI. Table 1 shows the baseline characteristics by incontinence subtype. Women with MUI had significantly higher UDI scores (61 ± 23 ; $p < 0.0001$) and greater bother than those with pure SUI (40 ± 26) or pure UUI (40 ± 25). There was not a significant difference in UDI scores in women with pure stress and pure urge incontinence ($p = 0.81$). Significantly more women (46%) with MUI reported “quite a bit” of bother to the stress-type leakage question 17 of the UDI than women with pure SUI (25%; $p < 0.0005$). Similarly, more than half (51%) of women with MUI reported “quite a bit” of bother to the urge-type leakage question 16 of the UDI than women with pure UUI (28%; $p < 0.0005$).

Women with MUI had significantly higher stress and urge subscales scores (Table 2) and reported significantly more leakage than women with either pure SUI or UUI, respectively. Table 3 shows the correlation between UDI-6

Table 1 Baseline characteristics

| Baseline characteristics | Stress | Urge | Mixed |
|----------------------------|------------|------------|------------|
| Age mean (range) | 62 (20–93) | 51 (15–83) | 58 (16–91) |
| Parity mean (range) | 2.6 (0–6) | 2.2 (0–7) | 2.6 (0–8) |
| White (%) | 85.9 | 83.3 | 85.1 |
| Black (%) | 11.9 | 7.9 | 6.1 |
| Hispanic (%) | 1.0 | 7.0 | 7.0 |
| Other (%) | 1.2 | 1.8 | 1.8 |
| Postmenopausal (+) HRT (%) | 75.6 | 37.7 | 55.3 |
| Postmenopausal (–) HRT (%) | 8.9 | 17.4 | 15.9 |
| Premenopausal (%) | 15.6 | 44.9 | 28.8 |

Table 2 MESA subscale scores by incontinence subtype

| MESA subscale | Mixed incontinence | Pure stress incontinence | Pure urge incontinence | <i>p</i> value ^a |
|------------------------|--------------------|--------------------------|------------------------|-----------------------------|
| Stress score (mean±sd) | 16±6 | 11±7 | 3±3 | <0.0001 |
| Urge score (mean±sd) | 9±4 | 1±1 | 6±3 | <0.0001 |

^a Kruskal–Wallis

responses by incontinence subtype. This shows that women with mixed and pure urge incontinence had a moderate correlation to bother rated by their answers to urge-type leakage questions 15 and 16 of the UDI-6. Women with mixed and pure stress incontinence had a moderate correlation to bother as rated by their answers to stress-type leakage question 17 on the UDI-6. The correlation between bother and MESA scores were stronger in women with pure UUI or pure SUI than women with MUI.

Discussion

Significantly more women (at least 46%) with MUI reported “quite a bit” of bother to either the stress- or urge-type leakage questions than women with pure incontinence subtypes ($p < 0.0005$). This is despite that fact that the correlation between bother and MESA scores was stronger in women with pure incontinence subtypes (SUI or UUI).

This data would suggest that women with MUI experienced greater overall quality of life (QOL) impact and more frequent incontinence as noted by their answers to two validated questionnaires. Our finding that women with mixed incontinence experience greater bother from the combination of their incontinence symptoms than women with either pure stress or urge incontinence may also suggest that multiple incontinence symptoms may have an additive deleterious impact on a woman’s QOL.

Because the UDI-6 focuses on both urge and stress symptoms, patients with mixed incontinence achieved higher UDI scores compared to women with pure UUI or pure SUI. It is interesting to note that patients with mixed incontinence had a higher score on the MESA urge subscale compared to patients with pure UUI. Patients with mixed incontinence also had a higher score on the MESA

stress subscale compared to patients with pure SUI. These results show that patients with MUI perceive their symptoms as more severe compared to patients with pure urge or stress incontinence. In addition, the correlation between MESA scores and specific UDI questions was higher in patients with pure urge or stress incontinence compared to mixed incontinence patients. These findings further supports our assumption that it is the additive symptoms from stress and urge incontinence that have the greatest impact on the bother and not just the severity of the individual symptom.

Previous studies have demonstrated that patients who had larger amounts of urine lost on pad testing correlated modestly with QOL [9]. Stach-Lempinen et al. also found a strong correlation between QOL measured by a visual analogue scale and pad test results [10]. When a linear regression model containing age, maximum detrusor pressure, urethral closure pressure, maximum cystometric capacity, incontinence diagnosis, and 24-h urine leakage on pad testing was run, only pad test results correlated with the QOL ($\beta=0.25$, $p < 0.05$) [10]. These studies show that incontinence symptoms and increased urinary leakage are correlated with decreased QOL. Our data build upon this, showing that multiple types of incontinence symptoms could have an additive deleterious impact on a woman’s QOL. Studies have also investigated the effects of different types of urinary incontinence on female sexual function with a reliable and validated questionnaire, the Female Sexual Function index. It is interesting to note that it was demonstrated that women with MUI, when compared with other types, had a significant impact on sexual function [11]. This again could support our findings that patients with multiple pelvic floor symptoms could experience an additive deleterious impact on their QOL.

This study has several limitations including the fact that this data is based on a referral population and no objective

Table 3 Correlation between UDI-6 and MESA scores

| UDI-6 question | Mixed incontinence Spearman’s ρ | Pure stress incontinence Spearman’s ρ | Pure urge incontinence Spearman’s ρ |
|---|--------------------------------------|--|--|
| #15: Do you experience frequent urination? | 0.24 | N/A | 0.43 |
| #16: Do you experience urine leakage associated with the feeling of urgency? | 0.49 | N/A | 0.61 |
| #17: Do you experience urine leakage related to coughing, sneezing or laughing? | 0.57 | 0.68 | N/A |

p value: all <0.0001

measures of incontinence were used. In addition, we used an arbitrary rating to classify women into incontinence types based on self-reported answers to validated questionnaires. Yet, urodynamics have also proven to be of little benefit in helping to adequately classify these patients. In addition, in a clinical setting, most patients are classified based upon self-reported symptoms and do not undergo urodynamics unless they are surgical candidates. Thus, we can only go based on a woman's symptoms as she perceives them to occur. Furthermore, in reality, this is often how most physicians will initially start the management of these patients.

Our finding may imply that the alleviating of even one source of a woman's urinary incontinence symptoms may help to improve her QOL and decrease her perceived burden of bother from these symptoms. This information may help in the consultation of patients presenting for mixed incontinence symptoms. Clinically, treatment is often aimed at the most bothersome symptom. However, physicians should be aware that persistent urgency and urge incontinence following anti-incontinence surgery may reduce patient perception of satisfaction.

Future studies could focus on mixed incontinence patients comparing those who are initially treated for urge incontinence symptoms versus those who are initially treated for stress incontinence symptoms and their perception of bother and improvement following treatment.

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References

- Abrams P, Cardozo L, Fall M, Griffiths D, Rosier P, Ulmsten U et al (2002) The standardisation of terminology of lower urinary tract function: report from the standardisation Sub-committee of the International Continence Society. *Neurourol Urodyn* 21:167–178
- Bump RC, Norton PA, Zinner NR, Yalcin I (2003) Duloxetine Urinary Incontinence Study G: Mixed urinary incontinence symptoms: urodynamic findings, incontinence severity, and treatment response. *Obstet Gynecol* 102:76–83
- Cardozo LD, Stanton SL (1980) Genuine stress incontinence and detrusor instability—a review of 200 patients. *Br J Obstet Gynaecol* 87(3):184–190
- Sandvik H, Hunskaar S, Vanvik A, Bratt H, Seim A, Hermstad R (1995) Diagnostic classification of female urinary incontinence: an epidemiological survey corrected for validity. *J Clin Epidemiol* 48:339–343
- Weidner AC, Myers ER, Visco AG, Cundiff GW, Bump RC (2001) Which women with stress incontinence require urodynamic evaluation? *Am J Obstet Gynecol* 184:20–27
- Hannestad YS, Rortveit G, Sandvik H, Hunskaar S (2000) A community-based epidemiological survey of female urinary incontinence: the Norwegian EPINCONT study. *J Clin Epidemiol* 53:1150–1157
- Herzog AR, Diokno AC, Brown MB, Normolle DP, Brock BM (1990) Two-year incidence, remission, and change patterns of urinary incontinence in noninstitutionalized older adults. *J Gerontol* 45:M67–M74
- Barber M, Walters M, Bump R (2005) Short forms of two condition-specific quality-of-life questionnaires for women with pelvic floor disorders (PFDI-20 and PFIQ-7). *Am J Obstet Gynecol* 193:103–113
- Nager CW, Schulz JA, Stanton SL, Monga A (2001) Correlation of urethral closure pressure, leak-point pressure and incontinence severity measures. *Int Urogynecol J Pelvic Floor Dysfunct* 12:395–400
- Stach-Lempinen B, Kirkinen P, Laippala P, Metsanoja R, Kujansuu E (2004) Do objective urodynamic or clinical findings determine impact of urinary incontinence or its treatment on quality of life? *Urology* 63:67–71
- Iker S, Onaran M, Aksakal N, Acar C, Tan MO, Acar A, Bozkirli I (2006) The impact of urinary incontinence on female sexual function. *Adv Ther* 23(6):999–1008