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Urinary incontinence (UI) and new psychological distress among community dwelling older adults

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Abstract

This study aimed at determining whether UI is associated with increased risk for the onset of psychological distress. This was a population based longitudinal survey of adults aged 50 and older who did not report psychological distress in 1993 and for whom complete data were available. Participants were classified as having UI if they reported uncontrolled urine loss within 12 months of the 1993 interview. Condition-specific functional loss secondary to UI was assessed by questions on participants' ability to engage in certain activities due to UI. Psychological distress was assessed using the General Health Questionnaire (GHQ) in 2004. The continuing participants were living in East Baltimore, Maryland in 1981. Persons with UI in 1993 were more likely to experience new psychological distress in 2004 than were persons without UI in 1993 adjusting for potentially influential covariates (relative odds (RO) = 2.18, 95% confidence interval (CI) = 1.19–4.01). Persons with condition-specific functional loss secondary to UI were more likely to experience new psychological distress than were persons without UI adjusting for potentially influential covariates (RO = 7.57, 95% CI = 2.92–19.62). We conclude that UI, especially when associated with condition-specific functional loss, predicted the onset of psychological distress among community dwelling older adults.

Keywords

Urinary incontinence in older adults; Psychological distress; Depression; Functional status; Longitudinal survey

1. Introduction

UI is a prevalent, distressing condition particularly among older adults. Among community dwelling older adults, as many as a third of men and one half of women are affected by urinary incontinence (Minassian et al., 2003; Dooley et al., 2008), and in nursing homes prevalence estimates range between 43% and 77% (Offermans et al., 2009). Because the prevalence rates of urinary incontinence are highest among the oldest adults, the public health significance of urinary incontinence continues to increase with the aging of a population. The majority of older adults experiencing urinary incontinence do not seek treatment (Koch, 2006; Harris et al., 2007) despite the availability of efficacious treatment for urinary incontinence (Holroyd-Leduc and Straus, 2004; Shamliyan et al., 2008, 2009). The shame and chronic embarrassment associated with urinary incontinence are likely barriers to treatment seeking in persons with urinary incontinence (Dugan et al., 2001; Shaw, 2001; Hagglund and Wadensten, 2007).

UI has a profound effect on quality of life. UI may result in fear of humiliation, social isolation, and loss of self esteem. Older adults experiencing UI describe experiencing feelings of vulnerability, powerlessness and humiliation as well as increased symptom burden over time (Bradway, 2005; Hagglund and Ahlstrom, 2007). Functional loss may be self-imposed resulting in lifestyle modifications such as avoiding social gatherings, traveling, or physical activities (Johnson et al., 2000; Milne and Moore, 2006). Withdrawal from these activities, although self-imposed, may lead to feelings of vulnerability and reduced quality of life. Although there are a number of potential mechanisms linking UI and depressive symptoms, functional loss secondary to UI leading to a more and more restricted lifestyle could lead to depression symptoms over time.

Prior cross sectional investigations in clinical and population based samples have revealed high rates of depression and anxiety symptoms among persons with UI (Lagro-Janssen et al., 1992; Boddien-Heidrich et al., 1999; Zorn et al., 1999; Dugan et al., 2000; Bogner et al., 2002a,b; Melville et al., 2002; Nygaard et al., 2003; Moghaddas et al., 2005; Bogner et al., 2010). However, the temporal relationships between urinary incontinence, depression and anxiety are not fully understood. Very few longitudinal studies have examined development of urinary incontinence and depressive symptoms over time. Two prospective studies found an increased risk of depression in persons with urinary incontinence. Heidrich and Wells (2004) found that among community dwelling elderly women, urinary incontinence was associated with greater risk of depression and lower levels of psychological well being over a 6 year period. Perry et al. (2006) found that incident cases of anxiety and depression were predicted by the presence of urge incontinence at baseline in a general practice based sample. Incident cases of urge incontinence were predicted by anxiety at baseline, but not depression. Two other prospective studies found an increased risk of urinary incontinence in adults with depression. Melville et al. (2009) found that among community dwelling women, major depression predicted the onset of urinary incontinence but that incontinence was not predictive of the onset of major depression. Thom et al. (1997) found that depression increased rates of newly recognized urinary incontinence among both male and female members of a health maintenance organization. However, the mechanisms underlying these relationships are unclear.

Our investigation differs in several ways from prior work examining the temporal association between urinary incontinence and psychological distress. Our sample is an ongoing prospective observational study allowing for the examination of temporal effects in disease causation over approximately a decade of follow up, nearly twice the length of follow up of other studies. Our investigation is strengthened because we are starting with a cohort of persons without psychological distress to consider whether urinary incontinence at baseline is associated with development of psychological distress at follow up. Our data includes variables for the assessment of self imposed functional loss resulting in lifestyle modifications specific to urinary incontinence allowing for the examination of the role of condition-specific functional loss as a potential mechanism underlying the association between urinary incontinence and new psychological distress (Fig. 1).

The purpose of this paper was to examine whether the inability to engage in certain activities due to urinary incontinence could lead to new psychological distress over time. In particular, our specific aim was to examine the occurrence of new psychological distress in community dwelling older adults with urinary incontinence with condition-specific functional loss, urinary incontinence without condition-specific functional loss, and no urinary incontinence. We hypothesized that persons with urinary incontinence with condition-specific functional loss would be more likely to report new psychological distress compared to persons who did not report urinary incontinence.

2. Methods

2.1. Baltimore Epidemiologic Catchment Area (ECA) Program follow-up

The ECA Program was a survey of psychiatric disorders in the general population conducted by the National Institute of Mental Health (NIMH) between 1980 and 1984 at five university based sites in the United States. The Baltimore site of the ECA Program (Regier et al., 1984; Eaton and Kessler, 1985) probabilistically sampled 175,211 adult household residents in Eastern Baltimore in 1981, selecting 4238 persons for participation. Among persons selected, 3481 completed household interviews (82% of persons selected by random sample) (Eaton et al., 1984). In 1982, a second wave of interviews was conducted among 2768 participants interviewed in 1981 (79.5%). Between 1993 and June of 1996, 1920 of participants interviewed in 1981 (69.4%) were interviewed again (Eaton et al., 1997). (Since most interviews were conducted in 1993 this wave is referred to as '1993'.) Between 2004 and 2005, 1071 participants interviewed in the prior wave (1993–1996) were interviewed again (55.8%). (Since most interviews were conducted in 2004 this wave is referred to as '2004'.) Data collected in 1993 and in 2004 are included in our analysis. Urinary incontinence was not assessed between 1981 and 1982 and therefore data from this wave is not included in our analysis. ECA data was obtained through highly structured interviews in a private place, usually the participant's home. Participants gave informed consent before their interview, per the study protocol approved by the Committee on Human Research of the Johns Hopkins University Institutional Review Board. The ECA study design and methods have been described in detail elsewhere (Eaton, 1985; Bogner et al., 2009).

2.2. The UI

The UI was assessed by the question: “Have you ever had any difficulty in controlling your water, that is, losing your urine or having trouble getting to the bathroom on time?” Persons reporting any uncontrolled urine loss within the 12 months prior to the 1993 interview were classified as having UI. Persons denying uncontrolled urine loss within the 12 months prior to the 1993 interview were classified as continent.

2.3. UI and condition-specific functional loss

Four questions assessed condition-specific functional loss associated with UI. Participants were asked if their UI resulted in: “avoiding social gatherings, visiting friends, going to church”; “avoiding traveling”; “not going shopping”; and “avoiding physical activities.” UI was the only condition assessed in the ECA assessing condition-specific functional loss. Participants with a positive response to any of these questions were categorized as having condition-specific functional loss due to UI.

2.4. Psychological distress

The GHQ was employed to assess psychological distress (Goldberg, 1972; Goldberg et al., 1976). The GHQ is widely used in clinical and community settings to assess psychological distress. The GHQ was scored using the conventional method in which a score of 4 or more indicated psychological “caseness”. This approach is consistent with previous studies from the ECA (Samuels et al., 1994; Gallo and Rabins, 1999). The GHQ helps identify persons who may have a psychiatric disorder without rendering a specific psychiatric diagnosis. In comparison with the standardized psychiatric examination in the Baltimore ECA, the GHQ is approximately 80% specific and 75% sensitive for depression (Samuels et al., 1994). A 20 item scale of the GHQ was employed in the ECA which has been described in detail elsewhere (Samuels et al., 1994).

2.5. Covariates

Gender, educational attainment (less than high school or greater than high school), self identified ethnicity (white or nonwhite), and marital status were assessed using standard questions. Activities of daily living (ADLs) were assessed by standard survey items on using the toilet, knife or fork to cut up food, getting to bed by oneself, dressing and undressing, and taking a bath or shower. Instrumental activities of daily living (IADLs) were assessed by standard survey items on keeping track of money and bills, being able to get together with friends preparing meals, cleaning house, and using the telephone. Consistent with previous ECA reports (Bogner et al., 2002a,b, 2010), individuals were characterized as having ADL or IADL impairment at follow up if they were unable to perform at least one activity without help. The Mini-Mental State Examination (MMSE) is a short standardized mental status examination widely employed for clinical and research purposes (Folstein et al., 1975). MMSE scores were analyzed as a continuous variable. Participants were asked if they had ever had diabetes, heart trouble, arthritis, stroke and cancer. A positive response to any of these conditions was considered a medical comorbidity.

2.6. Study sample

Of the 1920 persons interviewed in the household survey in Baltimore in 1993, 1071 were again interviewed in 2003 and 2004. Our study sample included 800 persons aged 50 and over in 2004. In order to examine the onset of psychological distress directly, we excluded 147 adults because they indicated that they had psychological distress in the 1993 interview. These exclusionary criteria allowed us to begin the observation interval with a cohort of individuals who did not have psychological distress. In addition, 94 people were excluded because they did not have complete data for other variables in our analysis, leaving a sample size of 559 for this analysis (Table 1). Respondents with and without missing data were similar in terms of age, gender, educational attainment, medical co morbidity, and functional impairment. Proportionally persons with missing data were more likely to self report their ethnicity as white than persons without missing data. In all, 82.8% of assessments of psychological distress were available for whites and 90.5% of assessments of psychological distress were available for other ethnic groups. We will examine the implications in the discussion of the study results.

2.7. Analytic strategy

The first step of our analysis involved calculating appropriate means and frequencies for each variable for participants with and without new psychological distress. Comparisons between groups of participants were made using Chi-square or *t*-tests as appropriate for categorical data or continuous data. Bivariate associations between urinary incontinence, psychological distress, and other important variables were examined. Next, multivariable analyses using the 1993 and 2004 interview data were carried out to assess the relationship of UI with and without condition-specific functional loss in 1993 in relation to new psychological distress in 2004. Multivariable models adjusted for age, gender, education level, ethnicity, ADL impairment, IADL impairment, and chronic health conditions by including them in the final models. All multivariate models were assessed for goodness of fit using the Hosmer–Lemeshow test (Hosmer and Lemeshow, 1989). Data analysis was performed using SPSS version 12 (SPSS, Chicago, IL).

3. Results

3.1. Sample characteristics

The mean age of the study sample was 62.8 ± 11.0 years ($\pm$ S.D.). In all 348 (62.3%) of the participants were women. The self identified ethnicity of participants was 341 whites (61.0%), 196 African Americans (35.1%), 9 American Indians (1.6%), 6 Hispanics (1.1%), 5 Asians (0.9%), and 2 Pacific Islanders (0.4%). Of the 559 participants, 113 (20.2%) reported having UI within one year of 1993. Among persons with UI, 95 (84.1%) were women and 81 (71.7%) were white. Among participants with UI, 24 (21.2%) reported condition-specific functional loss secondary to UI. Socio-demographic characteristics, functional status, chronic health conditions, and continence status were compared between persons with and without new psychological distress in 2004 (Table 2). Respondents with and without new psychological distress were similar in terms of age, gender, educational attainment, ethnicity, and cognition. Proportionally persons with new psychological distress were more likely to have functional impairment and report having had arthritis or stroke.

3.2. UI and new psychological distress

The association between UI and new psychological distress was examined using multiple logistic regression. A goodness of fit diagnostic and plots of the deviance residuals versus fitted values predicted by the model showed that the coefficient estimates were not influenced appreciably by any one observation. Persons with UI in 1993 were more likely to have new psychological distress as measured by the GHQ in 2004 than were persons without UI in 1993 (unadjusted RO = 2.17, 95%CI = 1.25–3.76). These findings remained significant after adjusting for age, education level, ethnicity, sex, IADL impairment, ADL impairment and chronic health conditions (adjusted RO = 2.18, 95%CI = 1.19–4.01).

3.3. UI associated with condition-specific functional loss

Multivariate analyses incorporating UI with and without condition-specific functional loss were performed. Three categories were created: no UI, UI with condition-specific functional loss and UI without condition-specific functional loss. These three categories were associated with the GHQ ($p < 0.001$). Results for these analyses are presented in Table 3. Persons who did not report condition-specific functional loss secondary to UI were similar in terms of new psychological distress to persons without UI (unadjusted RO = 1.32, 95%CI = 0.67–2.61). However, persons with condition-specific functional loss secondary to UI were more likely to have new psychological distress than were persons without UI (unadjusted RO = 7.18, 95%CI = 3.05–16.94). These findings remained significant after adjusting for age, gender, ethnicity, education, IADL impairment, ADL impairment, and chronic health conditions (adjusted RO = 7.57, 95%CI = 2.92–19.62).

4. Discussion

In this sample of community dwelling older adults, persons with urinary incontinence associated with condition-specific functional loss were more likely to report new psychological distress than persons without urinary incontinence. Other studies have shown a temporal association between urinary incontinence and measures of psychological status (Heidrich and Wells, 2004; Perry et al., 2006). However, our study suggests that condition-specific functional loss associated with the urinary incontinence and not urinary incontinence itself is most closely associated with new psychological distress.

Before discussing our findings, the results must first be considered in the context of some potential study limitations. First, only recently has consensus been reached on how to address urinary incontinence in population based surveys (Khouri et al., 2000; Litwin et al., 2005) and therefore our measure of urinary incontinence may be limited. Second, survey questions did not allow us to examine the distinction between severity and type of incontinence (urge, stress, mixed, overflow, or functional) in relation to new psychological distress. For example, depression and anxiety have been found to be associated with urge incontinence (Perry et al., 2006). However, a crude examination of all types of urinary incontinence together would likely reduce the chance of finding an association with distress, and would have biased our results toward the null. Third, retrospective interview data is associated with error such as recall and response bias. Individuals may modify responses based on social desirability and depressed persons may overestimate disability. We

attempted to mitigate these biases by limiting recall to the previous 12 months and by using available prospective data on psychological distress. Fourth, we had to exclude patients with missing data on psychological distress in 2004. However, our model under the missing at random assumption adjusts for any bias due to missing data rates that differ between covariates including ethnicity. Finally, while the initial study was drawn from a community sample, follow up data consisted of people that could be found and re-interviewed. Yet, studies based on the ECA follow up data have shown little influence of depression at baseline on loss to follow up (Eaton et al., 2008).

Despite these limitations our results deserve attention because we took advantage of a large, population based follow up to examine prospectively condition-specific functional loss associated with UI as a potential mechanism linking urinary incontinence and subsequent development of new psychological distress. Specifically, we started with a cohort of persons without psychological distress to consider whether condition-specific functional loss associated with UI is associated with the development of new psychological distress over approximately a decade of follow up. Findings from this study are generalizable to community dwelling older adults because our sample was drawn from a large ethnically diverse community based population. Our prospective data builds on prior work (Bogner et al., 2002a) and provides additional evidence of the public health significance of urinary incontinence and in particular, condition-specific functional loss associated with UI in the development of new psychological distress.

Consistent with our hypothesis, persons with urinary incontinence with condition-specific functional loss were more likely to report new psychological distress compared to persons who do not report urinary incontinence. The strongest predictor of new psychological distress was a positive response to any questions addressing how urinary incontinence interferes with daily activities. Our findings suggest that UI can limit the ability to do things outside the home, thus having important effects on psychosocial functioning. Intervention research may therefore benefit from assessment of functional loss specific to urinary incontinence.

The biological basis of UI (e.g., bladder function and physiology) has been the focus of much attention and research (Chen et al., 1993; Espey et al., 1998). Common biochemical or neurological pathways underlying UI and psychological health have been proposed as potential pathways explaining the high comorbidity of UI and mental disorders (Melville et al., 2009). Less emphasis has been given to the behavioral mechanisms through which UI relates to emotional health. Our findings indicate behavioral modification specific to UI may be strongly predictive of future psychological well being and may be an important target for intervention.

When providing care for older patients with UI, healthcare professionals should be alerted to the potential behavioral modifications and resulting psychosocial needs of these patients. Since the beginning of our investigation, research tools have been developed that could be useful in assessing the consequences of UI on quality of life and psychological distress in clinical practice. The Incontinence Impact Questionnaire and Incontinence Quality of Life Instrument are Likert structured instruments consisting of multiple items assessing the

influence of UI on components of life such as physical activity, travel, social relationships, and emotional health (Shumaker et al., 1994; Patrick et al., 1999). There are several other instruments that are also specifically designed to determine urinary incontinence severity and the impact on quality of life (van de Vaart et al., 2009). Specific items from these evaluations could be chosen for clinical screening to alert providers to functional impairment and the potential psychological distress of patients with UI. In addition, evidence of impaired function and quality of life may be an important determinant of treatment success (Gil et al., 2009).

5. Conclusions

Our study extends previous findings of an association between urinary incontinence and psychological distress by finding that interference in daily functioning specific to urinary incontinence may be a strong predictor of new psychological distress. Limitations in participation in daily activities should be assessed as incontinent symptoms begin to emerge. Interventions may need to address how persons feel about their incontinence and how urinary incontinence affects their lives. Future research should address whether early detection of urinary incontinence and associated distress improves quality of life. Interventions targeting functional impairment secondary to UI may have long term effects on psychological well being and, in turn, overall quality of life (Heidrich and Wells, 2004).

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Fig. 1.

Conceptual model for condition-specific functional loss associated with urinary incontinence as a potential mechanism linking urinary incontinence and subsequent development of psychological distress.

Table 1

Totals and percentages available for analysis in models including all covariates.

	Total from Baltimore ECA Follow-up study without psychological distress in 1993	% Available for the present analysis (<i>n</i> = 559)
Age, 50 years and older	653	85.6
Women	407	86.5
White	412	82.8
Education, <high school	191	82.3
ADL status impaired	14	100
IADL status impaired	24	100
Chronic health conditions	305	89.5
Total	653	85.6

Table 2

The GHQ status in 2004 by socio-demographic variables in 1993 among persons aged 50 and older, *n*, mean $\pm$ S.D., *n* (%).

Parameters	No psychological distress	New psychological distress	<i>p</i> <
Number	489	70	
Socio-demographic			
Age (years)	62.9 $\pm$ 11.0	61.6 $\pm$ 10.8	0.35
Women	303 (62.0)	45 (64.3)	0.71
Education, less than high school	132 (27.0)	26 (37.1)	0.08
White	300 (61.3)	41 (58.6)	0.66
Functional status			
ADL status impaired	6 (1.2)	8 (11.4)	<0.001
IADL status impaired	15 (3.1)	9 (12.9)	<0.01
MMSE score	28.1 $\pm$ 2.5	28.1 $\pm$ 2.0	0.90
Chronic health conditions			
Diabetes mellitus	45 (9.2)	9 (12.9)	0.33
Heart trouble	57 (11.7)	14 (20.0)	0.05
Arthritis	157 (32.1)	34 (48.6)	<0.01
Stroke	8 (1.6)	4 (5.7)	<0.05
Cancer	26 (5.3)	4 (5.7)	0.89
Urinary continence status			
No urinary incontinence,	399 (81.6)	47 (67.1)	<0.01
<i>Incontinent</i>	90 (18.4)	23 (39.9)	<0.01
With condition-specific functional loss	13 (2.7)	11 (15.7)	<0.001
Without condition-spec. functional loss	77 (15.7)	12 (17.1)	0.77

Table 3

Association between UI with and without functional loss in 1993 and new psychological distress in 2004 in persons aged 50 and older.

UI	Crude RO (95%CI)	Adjusted* RO (95%CI)
With condition-specific	7.18*	7.57*
Functional loss	(3.05–16.94)	(2.92–19.62)
Without condition-specific	1.32	1.28
Functional loss	(0.67–2.61)	(0.61–2.67)
None	1.00	1.00

* $P < .05$.