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Urinary incontinence is strongly associated with depression in middle-aged and older Korean women: Data from the Korean longitudinal study of ageing

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ABSTRACT

Objective: To investigate the relationship between urinary incontinence (UI) and depression in middle-aged and older Korean women.
Study design: A total of 1116 participants diagnosed with UI among 7486 respondents were included in this study, using data from a well-established survey that investigated a nationally representative population: the Korean Longitudinal Study of Ageing (KLoSA). Computer-assisted personal interviewing was used to assess the status of UI and depression. Depression was assessed using the 10-item Center for Epidemiological Studies-Depression (CES-D 10) scale. Odds ratios (ORs) and 95% confidence intervals (95% CIs) for depression were adjusted for age, household income level, marital status, education level, working status, smoking behavior, alcohol drinking behavior, exercise level, residence, and accompanying chronic diseases.
Results: The proportion of patients with depression was significantly higher among women with UI (9.1%) than among women without UI (6.3%) ($P < 0.0001$). The depression scores became worse with worsening UI symptoms (OR of better vs. same vs. worse, 1.00 vs. 1.51 vs. 2.15, respectively; P for trend = 0.0001), with an increased number of days experiencing UI during the prior month during the 2 years of the panel study period (OR of none vs. 1 ≤ days ≤ 10 days vs. 10 days < were 1.00 vs. 2.15 vs. 4.36; P for trend = 0.003).
Conclusions: Inadequately controlled and frequent UI is strongly associated with depression in middle-aged and older Korean women. The management of worsening UI may be of value as part of the assessment and management of depression.

Introduction

Urinary incontinence (UI) is a common cross-cultural condition and is reportedly highest among Hispanic women, followed by white, black, and Asian-American women (36%, 30%, 25%, and 19%, respectively) [1,2]. The prevalence of UI in Korean women is similar and is reportedly 24.4% in older patients and those with pelvic organ prolapse [3,4]. UI is troublesome, and affects activities of daily living, quality of life (QOL), economic status, and mental health [5]. In particular, psychological distress, depression, and anxiety in patients with UI can present with symptom aggravation, worsening QOL, and increased functional impairment [6–9]. Several large studies have shown that incontinent women tend to have more depression than continent women [10–13]. A recent long-term follow-up study reported that both depression and anxiety are associated with UI in Norwegian women [10]. A recent article reported that anxiety, depression, and prior sexual assault influence the natural history of overactive bladder in women veterans [13]. Ethnicity can affect the association between UI and depression; for example, the emotional effect of UI was greater in African-American women than in white women [14]. Therefore, a study in Korean women is essential to understand ethnic differences in the emotional significance of UI. To the best of our knowledge, such a study has not been conducted in Korean women; therefore, the objective was to investigate the relationship between the severity and frequency of UI and depression among women aged 45 years or older in a panel study, the 4th Korean Longitudinal Study of Ageing (KLoSA).

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Materials and methods

Data collection and participants

We obtained data from the 4th phase of the KLoSA, conducted by the Korea Labor Institute and the Korea Employment Institute Information Service in 2012. The KLoSA is a survey of nationally-representative Koreans aged 45 years or older, excluding institutionalized people and residents of Che-Ju Island. The KLoSA is a longitudinal dataset derived from a multidisciplinary, nationally representative, internationally harmonized panel survey. The 1 st KLoSA baseline survey was conducted in 2006 to create a nationwide basic dataset on the process of population ageing. A total of 10,254 participants were surveyed and interviewed. Among the original respondents, 7486 were able to participate in the 4th phase of the survey, conducted from July to December 2012. To investigate the association between UI and depression, the dataset consisted of 1116 participants who had been diagnosed with UI in phase 4. A total of 307 participants (307/7486, 4.1%) in this panel who were taking medication for mild mental disease were also excluded. A computer-assisted personal interview was conducted, in which professional interviewers instructed respondents to read questions on a computer and provide answers directly. Interviewers also provided information about research objectives, methods, potential benefits, and risks to all participants prior to the survey. Each KLoSA participant was identified by a randomly selected number to protect anonymity.

Study variables and measurements

Depression

Depression was assessed using the 10-item Center for Epidemiological Studies-Depression (CES-D 10) scale, a brief screening tool that assesses depressive symptoms experienced during the most recent week. Two items on the scale are in the positive phase area (being happy, enjoying life), and 8 are in the negative phase area (feeling depressed, feeling that everything I did was an effort, being restless, feeling lonely, feeling unfriendly, feeling sad, feeling that people disliked me, hard to get going). The responses for each item ranged from 0 to 3, with 0 signifying rarely (less than once a day), 1 signifying sometimes (1–2 days during the past week), 2 signifying often (3–4 days during the past week), and 3 signifying almost always (5–7 days during the past week). The total scores for all items, with scores reversed for the positive phase items, served as the outcome variable. Higher scores indicated greater mental distress. The cut-off between moderately severe and severe depression has been identified as 10 points [15], which is the standard cut-off score we used to define individuals with depression.

UI characteristics

The KLoSA survey includes broad questions about the progress of the UI and its frequency. Participants were asked to estimate progress with the following question: "How are your symptoms of UI since the last panel survey?" Possible answers were "completely recovered," "improved," "identical," "aggravated," and "severely aggravated." Next, we classified the status of UI into 3 categories: getting worse (aggravated and severely aggravated), same (identical), and getting better (improved and completely recovered). The severity of UI was estimated with the following question: "How many days did you suffer from UI last month?" Possible answers ranged from 0 to 30 days per month. We regrouped the frequency of UI into 3 categories: 0, fewer than 10 days, more than 10 days.

The KLoSA survey included questions about age, household income, education, marital status, smoking, alcohol drinking behavior, exercise, residence, working status, and history of chronic diseases. The income level was categorized as <$1500, <$2500, or ≥$2500. The education level was categorized in 4 groups (elementary school, middle school, high school, or college). Marital status was divided into 2 categories: living with a spouse or living alone (including divorce, bereavement, separation, missing, and never married). Smoking and alcohol-drinking behavior were categorized as current, past, or never. Regular exercise was defined as exercise for at least one-half hour more than once per week. Administrative regions in Korea were categorized into 3 groups based on the size of population: rural areas (less than 50,000), cities (more than 50,000), and metropolitan cities (more than 1 million). Chronic diseases included hypertension, diabetes, pulmonary and hepatic diseases, and arthritis. These diseases are well-known causes of depression [16–18]. Thus, we used participant self-reports about the status of these physician-diagnosed diseases during the follow-up period of 6 years.

Statistical analyses

We compared the demographic characteristics between participants with and without depression using a proportional trend test. Multiple logistic regression models were used to evaluate the association between control status/severity of UI and the risk of depression. Statistical analyses were performed using SAS (version 9.3, SAS Institute, Cary, NC, USA). A 2-tailed p-value of < 0.05 was considered statistically significant.

Results

Among 7486 respondents in the 4th phase of KLoSA, a total of 1116 women (14.9%) diagnosed with UI by physicians were included in this analysis. The proportion of patients with depression was significantly higher in women with UI (7.8%) than in women without UI (6.3%) ($P < 0.0001$). The depression scores became worse with worsening symptoms of UI (OR of better vs. same vs. worse, 1.00 vs. 1.51 vs. 2.15, respectively; P for trend = 0.0001), with an increased number of days experiencing UI during the past month during the 2 years of the panel study period (OR of none vs. 1 ≤ days ≤ 10 days vs. 10 days < were 1.00 vs. 2.15 vs. 4.36; P for trend = 0.003).

The demographic and clinical characteristics of the study population are shown in Table 1. Respondents were aged 60–80 years. The mean age of UI patients with depression was higher than that of UI patients without depression (69.60 vs. 64.89 years). The majority in both groups had income levels below $1500 per month, education level below elementary school, and irregularly exercised. In addition, the proportions of never smoked, current alcohol drinking, rural residence, and non-working status were higher in UI patients with depression than in those without depression, but the difference was not statistically significant.

Table 2 shows depression rates according to the progress of UI and the number of days the patient experienced UI during the prior month. Most UI patients, regardless of depression, reported that disease status had been stable for the prior year. Among 87 patients whose UI was getting worse, 15 had both UI and depression. Of 1038 UI patients without a comorbidity, 452 stated that they experienced UI for more than one day and fewer than 10 days during the prior month. On the other hand, of 104 patients with a comorbidity, 68 reported that they experienced UI for more than 10 days during the prior month.

Table 3 shows adjusted odds of depression for progress of UI and the number of days UI was experienced. The progress of UI was significantly associated with increased odds of depressive