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Research paper

The prevalence of urinary incontinence and factors associated with urinary incontinence in community dwelling older Turkish people

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ABSTRACT

Purpose: Urinary incontinence (UI) is very common problem in older problem. This study evaluates the prevalence of UI, and associated factors with UI in community dwelling older people in Turkey.
Materials and methods: This was a cross-sectional study as part of a health survey conducted with community dwelling older people. Demographic, clinical data, UI and its types were obtained by interview. Post-void residual (PVR) volume was measured with ultrasound.
Results: The prevalence of UI was 43.9%. The most common type was urge UI (23.7%). Associated factors with UI were gender, low income, low education level, chronic diseases, chronic constipation, chronic cough, number of deliveries, benign prostatic hyperplasia, past genitourinary surgery and lower urinary tract symptoms. PVR volume was not related with UI.
Conclusions: UI is very common in older people in Turkey. PVR volume is not related to the presence of UI in our study due to the lower prevalence of significantly high PVR volumes and lack of individuals with overflow UI.

1. Introduction

Urinary incontinence (UI) is defined as the complaint of any involuntary leakage of urine [1]. UI is common in older people due to the combined effects of aging on the genitourinary system and medical conditions [2]. UI affects life quality adversely [3]. UI can lead to complications such as perineal dermatitis and pressure ulcers as a result of skin moisture and irritation, urinary tract infections due to urinary retention and indwelling catheters, falls and fractures by slipping because of stepping on urine [4–7]. The economic burden of UI is also striking [4]. Although effective treatment options exist for UI, elderly people are generally reluctant to seek treatment and physicians underestimate UI [4].

The prevalence of UI increases with age and varies between different studies as a result of differences in UI definitions, study populations and other factors [8]. UI can be categorized as transient and chronic [4]. Stress UI (SUI), urge UI (UUI) and mixed UI (MUI) are the most common forms of chronic UI. SUI is defined as involuntary urine leakage during laughing, sneezing or physical exercise and UUI is defined as involuntary urine leakage following an urge to urinate [1,4]. MUI is defined as SUI and UUI seen together [1]. Other types of chronic UI are functional UI and overflow UI [9].

Post-void residual (PVR) volume is the urine volume remaining in the bladder after voiding. It indicates the emptying function of the bladder [10]. PVR volume can be measured by ultrasound or catheterization and increases with age [11,12]. In general, a PVR volume < 50 mL shows sufficient emptying, while a PVR volume > 200 mL is accepted as inadequate emptying [4].

The aim of this study was to evaluate the prevalence of UI, the prevalence of UI types, factors associated with UI including PVR volume measurement in a large sample of community dwelling older people in Turkey.

2. Materials and methods

2.1. Study protocol

This was a community-based study and had a cross-sectional design. It was part of a health survey organized by the health services of the Mamak municipality and the Geriatric Medicine Department of Ankara University School of Medicine. The target

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population was community dwelling individuals who were 65 years old or older and living in the Mamak district of Ankara, Turkey. Informative leaflets and telephone calls were used to invite participation in the health survey. The public relations office of the Mamak municipality organized the invitation process. Informative leaflets were prepared by the public relations office of the Mamak municipality in consultation with the medical team of the health survey. Older people who volunteered were admitted to the medical center of the Mamak municipality to be evaluated for recruitment. Inclusion criteria for this study were to be 65 years old or older and to give signed informed consent. Exclusion criteria were illness like stroke, severe arthritis, injury, or restraint that interfered with mobility, communication problems, advanced dementia, malignancy, drug related acute onset UI, UI that had been present less than 1 month and urinary tract infection. A total of 1000 older individuals were suitable for inclusion in the study.

2.2. Data collection

Demographic data, information about comorbidities, medications and past surgeries were obtained by face to face interview. The monthly income levels were defined as: low $<$ 512 € and moderate to high $\geq$ 512 € (1 € = 1.7282 Turkish lira in January 2008). This limit based on the minimum retired pay of a worker in 2008. Questionnaire form was developed by study team. History of cardiovascular diseases, neurologic diseases, diabetes, depression, benign prostatic hypertrophy and chronic obstructive lung disease were defined according to the self-report data and the presence of medications used for these diseases. Chronic cough is defined as a cough that lasts for 8 weeks or longer. Chronic constipation is defined according to the Roma III criteria. All participants were questioned for the presence and type of UI. The presence of UI and UI types were investigated using 3 Incontinence Questions (3IQ). The 3IQ questionnaire is a useful test with acceptable accuracy for classifying UUI and SUI [13]. The frequency of UI was categorized as a few times a month, a few times a week or daily. The amount of urine lost per UI episode was categorized as drops or more. Lower urinary tract symptoms (LUTS) were defined according to the report from the standardisation sub-committee of the International Continence Society [1].

2.3. Post-void residual volume measurement

PVR volume was performed on another day that the interview and participants were invited for measurements. A total of 866 participants responded. PVR volume measurements were performed at the health center of Mamak municipality. A portable ultrasound device (Cubescan BioCon-700 Bladder Volume Measurement System, Roxon medi-tech Ltd.) was used for PVR volume measurement. Participants were asked not to urinate when they woke up on the morning of the testing day in order to avoid emptying their bladders. Participants went to the bathroom and emptied their bladder. Measurements were performed immediately after voiding with the patient in a supine position. A trained nurse performed all PVR volume measurements. According to the protocol, the study nurse uncovered the area between the umbilicus and the pubis of each participant and then the ultrasound device was switched on. The patient type (female or male) was selected using an icon on the touch screen. The male setting was used for women who had a hysterectomy. Afterwards, ultrasound gel was applied and the ultrasound probe was placed approximately 3 cm above the symphysis pubis at 60° from the participant. The bladder was located using the pre-scan function. After the bladder was centered on the green line, the bladder was scanned and PVR was measured automatically by the software of the ultrasound device. The average of two measurements was taken as the final PVR volume. Results were given in milliliters.

2.4. Statistical analysis

Statistical Package for Social Sciences version 11.5 (SPSS Inc; Chicago IL, USA) program was used for statistical analysis. Numeric variables were given as mean ± standard deviation (SD). If distribution of a numeric variable was not normal, the median (minimum-maximum) was used. Percentages were used to describe nominal and ordinal variables. Numeric variables were assessed by Independent Samples *t*-Test, Mann-Whitney and Kruskal-Wallis H test. Nominal and ordinal variables were assessed by Chi^2 test. *P*-values of 0.05 or less were accepted as statistically significant.

Informed consent was obtained from all study participants. This study was approved by the ethical committee of the Ankara University School of Medicine (the decision number: 124-3367) in 21.01.2008. No potential conflicts of interest were disclosed.

3. Results

A total of 1000 individuals participated in the study. Ages of participants were not normally distributed, as assessed by Shapiro-Wilk's test ($P < 0.05$). The median age of the study population was 70 (65-92). Among all participants, 49.2% (492) were male and 50.8% (508) were female. The mean age of female and male participants was 70.29 ± 5.68 and 71.4 ± 5.42 respectively.

3.1. The prevalence of UI and UI types

The prevalence of UI was 43.9% ($n = 439$) in our study population. The prevalence of UI types were 23.7% ($n = 237$), 6.3% ($n = 63$), 8.8% ($n = 88$) and 5.1% ($n = 51$) for UUI, SUI, MUI and other types of UI, respectively. The prevalence of UI and UI types in the entire population and according to gender is shown in Table 1. UUI was the most common UI type among females and males. Overall, UI prevalence was significantly higher in women (277 [54.5%]) compared to men (162 [32.9%]) ($P < 0.001$). While UUI, SUI and MUI were significantly higher in women (130 [25.5%], 63 [12.5%], 84 [16.5%], respectively) compared to men (107 [21.8%], 0 [0%], 4 [0.8%], respectively) ($P < 0.001$), other types of UI were significantly higher in men (51 [10.3%]) compared to women (0 [0%]) ($P < 0.001$) (Table 1). Of participants with UI, 74.9% reported drops for the amount of UI and 25.1% reported more than drops as the amount of UI. The reported frequencies of UI for a few times a month, for a few times a week and for daily were 3.7%, 31.4% and 64.7%, respectively.

Table 1
The prevalence of UI and UI types in the total population and according to gender.

UI and UI types	Female ($n = 508$)	Male ($n = 492$)	*P*-value	Total population ($n = 1000$)
UI	54.5% (277)	32.9% (162)	< 0.001	43.9% (439)
Urge UI	25.5% (130)	21.8% (107)	< 0.001	23.7% (237)
Stress UI	12.5% (63)	0% (0)	< 0.001	6.3% (63)
Mixed UI	16.5% (84)	0.8% (4)	< 0.001	8.8% (88)
Other UI	0% (0)	10.3% (51)	< 0.001	5.1% (51)

UI: urinary incontinence.