Types of urinary incontinence in Bangladeshi women at midlife: Prevalence and risk factors

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ABSTRACT

Objective: To determine the prevalence of, and risk factors for, sub-types of urinary incontinence (UI) in a nationally representative sample of midlife Bangladeshi women.

Methods: Bangladeshi women, aged 30–59, recruited by multi-stage cluster sampling, completed the Questionnaire for the Diagnosis of Urinary Incontinence. The prevalence and the factors associated with each form of UI were explored using multivariable weighted logistic regression.

Results: 59.3% of the women were premenopausal, 8.4% perimenopausal and 32.3% postmenopausal. 83.2% had a BMI $< 28\,kg/m^2$ and none were using menopausal hormone therapy. The prevalence of stress UI was 5.4% (95% CI 4.4–6.6%), urgency UI 11.3% (9.8–12.9%), and mixed UI 7.0% (5.8–8.3%). Urgency UI was the most prevalent form of UI at each decade of age. Postmenopausal women were significantly more likely to have urgency UI (AOR 2.41, 95%CI 1.38–4.20; p = 0.002) and mixed UI (AOR 2.35, 95%CI 1.22–4.50; p = 0.010). Having more than 2 children was significantly associated with stress UI (AOR 2.79, 95%CI 1.30–6.00; p = 0.009) and urgency UI (AOR 2.34, 95%CI 1.28–4.30; p = 0.006), pelvic organ prolapse with stress UI (AOR 2.46, 95%CI 1.34–4.52; p = 0.004) and mixed UI (AOR 3.40, 95%CI 2.00–5.80; p < 0.0001), and diabetes with mixed UI (AOR 3.16, 95%CI 1.67–5.97; p < 0.0001). The women in the highest wealth quintile (AOR 0.27, 95%CI 0.10–0.72; p = 0.009) and underweight women had a lower risk of urgency UI (AOR 0.21, 95%CI 0.06–0.77; p = 0.018), while urgency UI was associated with working outside the home (AOR 3.11, 95%CI 1.36–7.15; p = 0.007) and obesity (AOR 3.00, 95%CI 1.57–5.74; p = 0.001).

Conclusions: The overall prevalence of UI amongst Bangladeshi midlife women is low, with urgency UI the most common form, in contrast to developed countries, where stress UI predominates. Being postmenopausal, having more than two children, being obese and working outside the home increase the likelihood of urgency UI, whereas higher socio-economic status and lower weight appear to be protective. Menopausal hormone therapy use was not reported by any study participants.

1. Introduction

Urinary incontinence (UI), the involuntary loss of urine, affects women of all ages and across different cultures and races [1–3]. Studies in developed countries show that UI impairs physical, mental and sexual health [4–6], with women reporting embarrassment, fear of odour, low self-esteem, and social withdrawal [6,7]. The limited data from Bangladesh shows an association between UI and depression in elderly women [8]. It is estimated that more than 200 million women around the world presently experience UI [9]. The reported prevalence of UI varies between 5.2% and 70.8%, with some studies suggesting prevalence rates may be higher in developing countries than developed

countries [1,3,9,10]. There is a paucity of data to support this conclusion, and little is known of the epidemiology of the subtypes of UI, namely stress, urgency and mixed UI, in developing countries. Risk factors that have been associated with stress and urgency UI in developed countries include age, menopausal status, obesity, vaginal delivery, parity, chronic pelvic pain, hypertension, constipation, diabetes mellitus, and age, overweight, having at least one comorbidity, respectively [4,11,12]. Mixed UI has been associated with age, overweight and obesity, past hysterectomy, having at least one comorbidity and chronic obstructive pulmonary disease [4,11,12]. Whether these risk factors extend to developing countries remains to be established. Considering the increasing prevalence of weight excess and that

childbirth at a young age is very common in developing countries, we hypothesized that stress UI would be common and that parity and BMI would be strong risk factors for UI amongst midlife women in Bangladesh.

The Bangladesh Midlife Women's Health Study (BMWHS) was a national, cross-sectional study that recruited a representative sample of women aged 30–59 years [13]. This study has provided a unique opportunity to report the prevalence of, and risk factors for, the subtypes of UI identified by a validated questionnaire.

2. Materials and methods

2.1. Study design and participants

The BMWHS was a population-based cross-sectional study, with participants recruited between September 2013 and March 2014, from seven randomly selected districts within the seven divisions of Bangladesh, as described in detail elsewhere [13]. Utilizing a multi-stage cluster sampling technique, based on the Population and Housing Census 2011, the number of women aged 30–59 years recruited in each of the seven districts was determined by the distribution of the 3·24 million women of the target age group in these districts [14]. The smallest defined unit (enumeration area; EA) within each of the seven districts included, on average, 120 households [15]. When the total sample size was distributed across the rural and urban areas, the smallest number of women needed in any single EA was 36 [13]. Within each district, the urban-rural EAs were selected randomly. Within each EA, the first household was selected at random and subsequent households were selected using systematic sampling, with only one woman included from each household. If an eligible woman was not found in a selected household, the neighbouring household was approached. According to the multi-stage cluster design, sampling weight adjusted for unequal probabilities of selection and ensured representativeness of the sample at all stages as has previously been described [16].

The BMWHS was approved by the Monash University Human Research Ethics Committee, Melbourne, Australia (CF13/1280-2013000646), and the Bangladesh Medical Research Council, Dhaka, Bangladesh (BMRC/ERC/2013-2014/1336).

2.2. Sample size

The prevalence of UI was a pre-determined secondary outcome, with the primary outcome being awareness of cervical cancer screening. Therefore, the sample size calculation was based on the previously reported prevalence of cervical cancer screening uptake (8·6%) [17], with a margin of error of ± 2%, among women at midlife. This provided a minimum sample size of 755. The sample size was then multiplied by the design effect of 2 and further increased by 5% to allow for non-sampling error. The final sample size was 1586 women. The study was appropriately powered for the outcomes for UI subtypes reported here at 2% levels of precision [18].

2.3. Data collection

Data were collected by face-to-face interviews using a structured questionnaire, as literacy is low in Bangladesh. Four female interviewers underwent a two-week thorough training program, including mock interviews and field practice to ensure interview consistency and reliability. A verbal explanation of the study, the objectives and the anticipated time required for the interview, were given and confidentiality explained. Verbal consent was recorded for each participant. Completed questionnaires were checked daily. Households were revisited the day after the interview if response clarification was required, or to collect missing data.

The study questionnaire was developed in English and translated

into Bengali. It was then back-translated into English by a bilingual translator to verify validity and piloted amongst Bangladeshi women [13]. The study questionnaire comprised questions about personal, socio-demographic, and household characteristics. Women were asked if they were taking oral contraception or using menopausal hormone therapy. The accurate determination of the age of women in Bangladesh was a challenge, particularly for illiterate and/or older women due to lack of formal birth registration until 2007. A combination of the average age of onset of menarche in Bangladesh and life events were used to determine age that has been described in detail elsewhere [13]. Each household's 'wealth index' was derived from variables including housing materials, household assets and amenities, sources of water and toilet facilities [19]. Height and weight, in light clothing, were measured by the interviewers. Women were considered to have diabetes mellitus if they reported having been diagnosed by a health professional as having high 'blood sugar' or diabetes.

2.4. Outcomes

The presence and type of UI was assessed by the Questionnaire for Urinary Incontinence Diagnosis (QUID) [20]. The first three questions of QUID pertain to stress incontinence, while the last three to urgency incontinence over the past month. Each question includes 6 frequency-based response options, ranging from "none of the time = 0" to "all of the time = 5" (score 1 = rarely, 2 = once in a while, 3 = often and 4 = most of the time), which are scored from 0 to 5 points. Scores are summed resulting in separate stress and urgency scores, each ranging from 0 to 15 points. A total score of ≥4 out of 15 for questions 1–3 classified a woman as having stress UI and a total score of ≥6 out of 15 for questions 4–6 classified a woman as having urgency UI [21]. Women with both stress and urgency UI were classified as having mixed UI.

2.5. Statistical analysis

The weighted prevalence estimates and 95% confidence interval (95% CI) for each UI subtype, incorporating the design effect, appropriate sample weights, and complex sample design are presented. Estimates with relative standard errors of more than 25% were not considered statistically reliable [22]. 'The wealth index' of each household was constructed using a principal component analysis and is expressed as wealth quintiles [19,23]. Since "the Boy or Girl, two-children are enough" campaign has played a vital role in reducing population growth over the last 25 years in Bangladesh, parity was treated as dichotomous for regression analyses, 'two or fewer children' versus 'more than two children' [24]. Multivariable weighted logistic regression analyses were used to calculate the adjusted odds ratios (AORs) and 95% CIs controlling for the potential and known risk factors for each form of UI. We considered 13 variables as potential predictors for all outcomes. We developed two sets of multivariable models, one including age and the other including menopausal status (pre-, peri, and post) along with all other variables described below. It is not appropriate to include both age and menopausal status in the same model as they are highly correlated. Furthermore, place of residence was excluded from the multivariable logistic regression model due to collinearity with the wealth quintile. Religion and use of the oral contraceptive pill (OCP) were not included in the model, as they were not statistically significant in univariate logistic regression analyses. Regression analyses were restricted to non-hysterectomised women as the reasons women had a hysterectomy were not known. Data about mode of childbirth was not collected. For women of this age in Bangladesh, over 93% would have had home births, with about 10% delivered by skilled birth attendants, and less than 2% would have had a caesarean section [25,26]. Thus, the number of births was considered as indicative of the number of vaginal deliveries. All statistical tests were two-sided, and a p-value < 0·05 was considered statistically significant.