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Prevalence of Urinary Incontinence and Probable Risk Factors in a Sample of Kurdish Women

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معدل انتشار سلس البول وعوامل الخطورة المحتملة بين مجموعة من النساء الكرديات

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الملخص: الهدف: يعتبر سلس البول من أهم مظاهر اعتلال قاعدة الحوض، والذي يصيب 15–50% من البالغات اعتمادا على العمر وعوامل الخطورة للعينة المدروسة. **الهدف:** حساب معدل انتشار سلس البول وعوامل الخطورة المحتملة، دراسة خواص النساء المصابات، ووصف أنواع سلس البول لدى المصابات. **الطريقة:** إجريت دراسة مقطعية في مستشفى الامومة في أربيل، كردستان العراق للفترة من شباط الى اب 2011. شملت الدراسة 1,107 إمرأة من مرافقات المريضات الراقدات في المستشفى. تم تصميم إستمارة لجمع المعلومات من قبل الباحثين. تم استخدام فحص كاي الاحصائي لدراسة العلاقة بين سلس البول وعوامل الخطورة. إستخدم كذلك فحص الانحدار اللوجستي الثنائي. **النتائج:** معدل إنتشار ساس البول كان 51.7%. كان معدل إنتشار سلس البول الاجهادى، والعصبى، والنوع المختلط 5.4%، 13.3%، و 33% على التوالي. كانت هناك علاقة معتدة إحصائيا بين سلس البول وإنقطاع الطمث، زيادة عدد الأطفال، داء السكر، السعال المزمن، الإمساك، وتاريخ إجراء عمليات نسائية. بينما كانت هناك علاقة عكسية (سالبة) بين سلس البول وتاريخ الولادة بشكل طبيعي أو بالعملية القيصرية. **الخلاصه:** كان معدل إنتشار سلس البول مرتفعا في العينة المدروسة، وكانت عوامل الخطورة المحتملة هي تعدد الولادات، إنقطاع الطمث، الإمساك، السعال المزمن، وداء السكري.

مفتاح الكلمات: معدل الانتشار؛ النساء؛ عوامل الخطورة؛ إنقطاع الطمث؛ نوعية الحياة؛ سلس البول؛ العراق.

abstract: ***Objectives:*** The most common manifestation of pelvic floor dysfunction is urinary incontinence (UI) which affects 15–50% of adult women depending on the age and risk factors of the population studied. The aim of this study was to determine the probable risk factors associated with UI; the characteristics of women with UI; describe the types of UI, and determine its prevalence. ***Methods:*** A cross-sectional study was conducted between February and August 2011, in the Maternity Teaching Hospital of the Erbil Governorate, Kurdistan Region, northern Iraq. It included 1,107 women who were accompanying patients admitted to the hospital. A questionnaire designed by the researchers was used for data collection. A chi-square test was used to test the significance of the association between UI and different risk factors. Binary logistic regression was used, considering UI as the dependent variable. ***Results:*** The overall prevalence of UI was 51.7%. The prevalence of stress, urgency, and mixed UI was 5.4%, 13.3% and 33%, respectively. There was a significant positive association between UI and menopause, multiparity, diabetes mellitus (DM), chronic cough, constipation, and a history of gynaecological surgery, while a significant negative association was detected between UI and a history of delivery by both vaginal delivery and Caesarean section. ***Conclusion:*** A high prevalence of UI was detected in the studied sample, and the most probable risk factors were multiparity, menopausal status, constipation, chronic cough, and DM.

Keywords: Prevalence; Women; Risk factors; Menopause; Quality of life; Urinary incontinence; Iraq.

Advances in knowledge

- *This study provides information for the first time on the prevalence of all types of urinary incontinence (UI) in a sample of the Kurdish population of northern Iraq.*
- *Knowing probable risk factors of UI may help in counselling people regarding changing their lifestyles and improving conditions so that UI can be avoided.*

Applications to Patient Care

- *This study provides information to healthcare providers on the risk factors for UI in order to help screen high-risk populations.*
- *Physicians and nurses should screen for UI during gynaecological examinations by directly questioning patients about symptoms of involuntary urine loss.*

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The most common manifestation of pelvic floor dysfunction is urinary incontinence (UI). Incontinence can have a significant impact on women's health, leading to physical problems such as skin breakdown, infection, and rashes. Psychosocial consequences include embarrassment, isolation and withdrawal, and feelings of worthlessness, helplessness, and depression.[1–3]

Through epidemiological studies, the International Continence Society (ICS) has developed a new definition of UI and its types. UI is defined as a complaint of involuntary loss of urine. Stress urinary incontinence (SUI) is defined as a complaint of involuntary loss of urine on effort or physical exertion. Urgency urinary incontinence (UUI) is defined as a complaint of involuntary loss of urine associated with urgency. Mixed urinary incontinence (MUI) is defined as a complaint of involuntary loss of urine associated with both urgency and physical exertion.[4]

Urinary incontinence is a medical condition affecting 15–50% of adult women depending on the age and risk factors of the population studied. It is considered one of the top 10 sources of expenditure for treatment of illness.[5] Approximately 50% of persons residing in nursing homes are incontinent and it is the tenth leading cause of hospitalisation.[6] Although half of all elderly people experience episodes of incontinence, it is also a problem that affects younger women.[7]

Even though information concerning its prevalence and incidence in the population as a whole remains uncertain, clinical attention is increasingly focused on UI and its treatment.[8] The lack of adequate epidemiological data on the prevalence of female UI in the Kurdish population of Erbil led us to conduct a cross-sectional study on a sample of women attending the Maternity Teaching Hospital in Erbil, Iraq. The aim of the present study was to determine the prevalence and characteristics of women with UI, to describe types of UI, and to find probable risk factors associated with UI.

Methods

A cross-sectional study was conducted between 10th February and 10th August 2011 in the Erbil Maternity Teaching Hospital in the Kurdistan Region of northern Iraq. The Erbil Maternity Teaching Hospital is the only governmental maternity hospital in Erbil and so receives obstetrical and gynaecological cases from all over the Erbil governorate. Erbil is the capital of the Iraqi Kurdistan Region with a population approaching two million.

The study was approved by the Erbil Directorate of Health and the scientific and ethical committees of the Nursing College. Included in the study were women accompanying patients admitted to the hospital. The purpose of the study was explained to each woman during personal interviews, and informed verbal consent was obtained from all participants.

Participants were excluded if they were pregnant or had urinary system problems. Data were collected *via* an English-language questionnaire which was designed by the researchers after reviewing published literature and consultating with experts. The questionnaire was translated into the Kurdish language and then reverse translated by an independent party to ensure accuracy. A pilot study was prepared by testing the final questionnaire, on 20 women attending the Erbil Maternity Teaching Hospital, to ensure a correct translation and easy understandability for ordinary women and to explore any unclear points. The questionnaire was completed during personal interviews with the women.

Data collection was performed by three Kurdish-speaking nurses who were working in inpatient wards. The nurses were trained regarding how to administer the questionnaire by one of the investigators. The questionnaire was designed to investigate the following: women's demographic characteristics; medical and obstetric history; maternal age; marital status; place of residence; parity and mode of previous deliveries (i.e. vaginal or Caesarean delivery); previous deliveries of macrosomic babies; previous abdominal surgery; presence of chronic diseases, including diabetes mellitus (DM); chronic cough or constipation; smoking, and menopausal state. The types of UI were diagnosed by asking about the frequency of micturition during the day, the presence of *nocturia* or a sudden desire to urinate which could not be deferred, and the leakage of urine on coughing or sneezing.

The sample size was estimated using the Epi Info 6 statistical software, Version 6.04 (Centers

Table 1: Association between urinary incontinence and age

Age group (years)	n	UI n (%)	*P* value
<45	43	41 (95.3)	<0.001
45–49	573	183 (31.9)	<0.001
50–54	190	131 (68.9)	<0.001
55–59	178	136 (76.4)	<0.001
≥60	123	81 (65.9)	<0.001
Total	**1,107**	**572 (51.7)**	

UI = urinary incontinence.

for Disease Control, Atlanta, Georgia, USA, and the World Health Organization, Geneva, Switzerland). The following data were entered into the programme: the estimated number of admitted women during the 6-month study period was 21,708. The estimated prevalence of UI was 30% based on the average prevalence of some studies.[2,5] The absolute precision was set at 2.5% (above and below the 30%) with a 95% confidence level. Accordingly, the estimated sample size was 1,218 women. A total of 1,107 women who were accompanying patients admitted to different departments of the same hospital were willing to participate in the study, so the non-response rate was 9.1%.

Data were analysed using the Statistical Package for Social Sciences (SPSS), Version 18 (IBM, Inc., Chicago, Illinois, USA). A chi-squared test of association was used to test the significance of the association between UI and different factors. Binary logistic regression was used considering the UI as the dependent variable. A *P* value of ≤0.05 was considered statistically significant.

Results

The mean age (± standard deviation [SD]) of participating women was 50.59 ± 6.77 years, ranging from 28 to 85 years. All of the women were married. The overall prevalence of UI was 51.7%. The prevalence of SUI, UUI, and MUI was 10.5%, 25.7% and 63.8%, respectively. The prevalence among those living outside the city (66.2%) was significantly higher than the prevalence among those living in the city (48%) (*P* <0.001). Also, the prevalence was higher among smokers (69.4%) as compared with the prevalence among non-smokers (48.7%) (*P* <0.001).

Table 1 shows a highly significant association between certain age groups and UI prevalence. A high prevalence of UI (95.3%) was found among those aged less than 45 years. The prevalence rates of UI among age groups 50–54 (68.9%), 55–59 (76.4%), and ≥60 (65.9%) were high. However, no consistent pattern of UI prevalence could be detected in different age groups.

Table 2: Association between types of urinary incontinence and age

Age group (in years)	n	Types of urinary incontinence			*P* value
		SUI n (%)	UUI n (%)	MUI n (%)	
<45	41	12 (29.3)	1 (2.4)	28 (68.3)	<0.001
45–49	183	19 (10.4)	61 (33.3)	103 (56.3)	<0.001
50–54	131	13 (9.9)	34 (26.0)	84 (64.1)	<0.001
55–59	136	13 (9.9)	30 (22.1)	93 (68.4)	<0.001
≥60	81	3 (3.7)	21 (25.9)	57 (70.4)	<0.001
Total	**572**	**60 (10.5)**	**147 (25.7)**	**365 (63.8)**	

SUI = stress urinary incontinence; UUI = urgency urinary incontinence; MUI = mixed urinary incontinence.

Table 2 shows a highly significant association between age groups and types of UI. The highest proportion of USI (29.3%) was in those aged 45 years or less. The overall proportion of UUI was 25.7%, while it was present in 33.3% in 45–49 year olds. The same table shows that 70.4% of those aged ≥ 60 years complained of MUI.

Results of the study showed a highly significant association between UI and menopause; parity (≥5); vaginal delivery; a history of giving birth to neonates weighing ≥4 kg; or a history of DM, chronic cough, constipation, or pelvic surgery [Table 3]. Table 4 shows that there was significant positive association between UI and many factors like menopause (odds ratio [OR] = 1.9); parity (OR = 2.5); DM (OR = 4.2); chronic cough (OR = 4.02); constipation (OR = 2.1), and a history of gynaecological surgery (OR = 2.9), while a significant negative association was detected between UI and a history of either vaginal or Caesarean delivery (OR = 0.11).

Discussion

The prevalence of UI ranges from 3–55% depending on the definition of incontinence and the age of the population studied.[2] The results of the present study showed that 51.7% of the sample had UI, which is

Table 3: Prevalence of urinary incontinence by obstetrical history

Variables	n	UI n (%)	*P* value
Menopausal status			
Yes	455	315 (69.2)	<0.001
No	652	257 (39.4)	
Parity			
≤4	331	96 (29)	<0.001
≥5	776	476 (61.3)	
Mode of delivery			
Vaginal	949	516 (54.4)	
Caesarean section	127	50 (39.4)	<0.001
Both	30	5 (16.7)	
Delivery of baby ≥4 kg			
Yes	319	225 (70.5)	<0.001
No	788	347 (44)	
Diabetes			
Yes	125	104 (83.2)	<0.001
No	981	467 (47.6)	
Chronic cough			
Yes	131	108 (82.4)	<0.001
No	973	462 (47.5)	
Constipation			
Yes	250	181 (72.4)	<0.001
No	855	390 (45.6)	
Previous pelvic surgery			
Yes	218	166 (76.1)	<0.001
No	844	406 (45.7)	

UI = urinary incontinence.

Table 4: Output of binary logistic regression showing the association between urinary incontinence as a dependent variable, and some other independent variables

Factor	B	*P*	OR	95% CI of OR	
				Lower	Upper
Residence	0.352	0.065	1.422	0.979	2.066
Smoking	-0.042	0.857	0.959	0.609	1.510
Menopause	0.753	<0.001	2.124	1.421	3.174
Grand multiparity	0.882	<0.001	2.415	1.667	3.498
Mode of delivery Cesarean section (reference)					
Vaginal delivery	0.442	0.100	1.556	0.919	2.632
History of both types	-2.201	**<0.001**	0.111	0.033	0.374
Delivery of baby ≥4 Kg	1.514	**<0.001**	4.543	3.109	6.638
Diabetes	1.347	**<0.001**	3.845	2.198	6.727
Chronic cough	1.457	**<0.001**	4.293	2.479	7.434
Constipation	0.740	**<0.001**	2.095	1.458	3.010
History of pelvic operation	1.154	**<0.001**	3.172	2.129	4.726
Age (years)	-0.016	0.264	0.984	0.956	1.012
Constant	-1.462	0.047	0.232		

B = regression coefficient; P = P value; OR = odds ratio; CI = confidence interval.

much higher than the neighbouring countries of Turkey and Iran. In a study done by Kocak *et al.* in Turkey on 242 women, the overall prevalence of UI was 23.9%.[9] In another study conducted in Iran on 411 married women, the overall prevalence of UI was 18.9%.[10] The high prevalence of UI in the present study could be due to the high number of vaginal deliveries in the Kurdistan region which is responsible for pelvic floor dysfunction. Also, UI health education is limited in our locality.

Regarding nutrition, which is responsible for the development of DM and overweight, both are strong risk factors for UI and could have been the cause of the high prevalence of UI in our sample. In a study conducted by Al-Bader *et al.* on 379 Saudi women with a mean age of 35 years, the overall prevalence of UI was 41.4%.11 In another study done in Egypt on 1,652 women, the overall prevalence of UI was 54.8%, which is consistent with the present study.[12] In a study conducted by Katz *et al.* on 851 women aged 18 years and older who were selected randomly in Australia, 267 women (31.3%) stated that they had noted some degree of incontinence during the preceding 12 months, and 142 (16.6%) suffered two or more regular episodes of leakage per month. Daily incontinence was reported by 5%, and 2.3% were incontinent often or continuously.[13]

Kim *et al.* conducted a study on 276 women in South Korea and found that the prevalence of UI by type was 12.8% (UUI), 38.5% (SUI), and 48.7% (MUI). These rates were higher than those in the present study.[14] The prevalence of the types of UI in a study conducted in the Turkey was 25.6% (UUI), 33.1% (SUI), and 41.3% (MUI), which was more or less consistent with the results of the present study.[9] The prevalence of different types of UI in a study conducted in Iran was 4.1% (UUI), 18.7% (SUI) and 4.1% (MUI); the prevalence of SUI was higher than that in the results of the present study, where we found a 10.5% incidence of SUI, while the incidence of UUI, and MUI was much lower.[10] Studies in Western countries have revealed that UUI is the most common type of UI in the elderly, occurring in 40–70% of those who present to physicians with

complaints of incontinence.[15] Brown *et al.*'s study of the prevalence of UI among 2,763 postmenopausal women found the prevalence of UI as follows: 14.4% (UUI), 12.8% (SUI), and 12.3% (MUI); the mean age in their study was 66.7 years.[16]

In the present study, the percentage of UI among those in the <45 years age group was high. This research is the first conducted in our locality related to UI in those of Kurdish ethnicity. This is significant as race/ethnicity differences exist in self-reported incontinence.[17,18] However, it is unknown how ethnic differences affect UI prevalence in young women. Further research should be conducted in a larger sample size of young Kurdish females to correlate the risk factors, as the sample size in this study (n = 43) was too small for this purpose.

Bunyavejchevin found a significant association between UI and chronic cough and constipation in the study on 360 postmenopausal Thai women, which is consistent with the result of the present study.[19] Tseng *et al.*, in their study on 4,470 Taiwanese women, found a significant association between UI and multiparity, and no association with age, which was also consistent with the result of the present study.[20]

In the current study, there was a significant association between UI and DM, chronic cough, and constipation which is consistent with the results of other studies.[11] SUI is triggered by physical exertion, including coughing, sneezing, straining, or exercise. In women, a weakness in the pelvic floor muscles, due to vaginal childbirth, may cause a defect in the support of the internal sphincter, ultimately leading to SUI. Multiparous women are prone to cystocele and urethrocele, which are also linked to SUI. A patient with DM has a 30–70% increased risk of developing UUI or MUI. Advanced age can also contribute to UUI.[8,11,12] Different studies have found a significant relationship between a history of pelvic surgery and UI, which is consistent with the result of the current study.[9–11]

The limitations of the present study were as follows: there was no validated instrument to detect prevalence rates of UI in Kurdish women, the prevalence of UI was not studied in one specific age group, and UI was not studied in relation to obesity. Further studies should be conducted to test these important correlations.

Conclusion

A high prevalence of UI was detected in a selected sample of Kurdish women in the Maternity Teaching Hospital in Erbil, Iraq. Associated risk factors were found to be the delivery of a baby ≥4 Kg, chronic cough, DM, a history of a pelvic operation, multiparity, menopausal status, and constipation. A history of both types of delivery had no protective effect against UI.

References

1. Lemone P, Burke K. Medical-Surgical Nursing, 3rd ed. New Jersey: Pearson Education 2004. Pp. 733–5.
2. Holroyd-Ledue JM, Straus SE. Management of urinary incontinence in women. JAMA 2004; 297: 986–95.
3. Abreu NS, Baracho ES, Tirado MGA, Dias RC. Quality of life from the perspective of elderly women with urinary incontinence. Rev Bras Fisioter, São Carlos, 2007; 11:429–36.
4. Haylen BT, de Ridder D, Freeman RM, Swift SE, Berghmans B, Lee J, et al. An International Urogynecological Association (IUGA)/International Continence Society (ICS) joint report on the terminology for female pelvic floor dysfunction. Int Urogynecol J Pelvic Floor Dysfunct 2010; 21:5–26.
5. Scott JR, Gibbs RS, Karlan BY, Haney AF. Danforth's Obstetrics and Gynecology, 9th ed. Philadelphia: Lippincott Williams & Wilkins, 2003. Pp. 845–50.
6. Krauss NA, Altman BM. US Department of Health and Human Services. Characteristics of Nursing Home Residents. From: http://meps.ahrq.gov/mepsweb/data_files/publications/rf5/rf5.shtml Accessed: Jul 2012.
7. Littleton L, Engebretson J. Maternal, Neonatal and Women's Health Nursing. Albany NY: Delmar, Thomson Learning, Inc., 2002. P. 245.
8. Smith DA. Urinary incontinence: Epidemiology, demographics and costs. Director 2003; 11:115–9.
9. Kocak I, Okyay P, Dundar M, Erol H, Beser E. Female urinary incontinence in the west of Turkey: Prevalence, risk factors, and impact on quality of life. Eur Urol 2005; 48:634–41.
10. Nojomi M, Amin EB, Rad RB. Urinary incontinence: Hospital-based prevalence and risk factors. JRMS 2008; 13:22–8.
11. Al-Badr A, Brasha H, Al-Raddadi R, Noorwali F, Ross S. Prevalence of urinary incontinence among Saudi women. Int J Gyecol Obstet 2012; 117:160–3.
12. EI-Azab AS, Mohamed EM, Sabra HI. The prevalence and risk factors of urinary incontinence and its influence on the quality of life among Egyptian women. Neurourol Urodyn 2007; 26:783–8.

13. Katz VL, Lobo RA, Lentz GM, Gershenson DM. Comprehensive Gynecology, 5th ed. Philadelphia: Mosby, 2007.

14. Kim JS, Lee EH, Park HC. Urinary incontinence: Prevalence and knowledge among community-dwelling Korean women aged 55 and over. J Korean Acad Nurs 2004; 34:609–16.

15. Merkelj I. Urinary incontinence in the elderly. South Med J 2001; 94:952–7.

16. Brown JS, Grady D, Ouslander JG, Herzog AR, Varner RE, Posner SF. Prevalence of urinary incontinence and associated risk factors in postmenopausal women. Obstet Gynecol 1996; 87:715–21.

17. Thom DH, Eeden SK, Ragins AI, Wassel-Fyr C, Vittinghof E, Subak LL, et al. Differences in prevalence of urinary incontinence by race/ethnicity. J Urol 2006; 175:259–64.

18. Dooley Y, Kenton K, Cao G, Luke A, Durazo-Arvizu R, Kramer H, et al. Urinary incontinence prevalence: Results from the national health and nutrition examination survey. J Urol 2008; 179:656–61.

19. Bunyavejchevin S. Risk factors of female urinary incontinence and overactive bladder in Thai postmenopausal women. J Med Assoc Thai 2005; 88:S119–23.

20. Tseng LH, Liang CC, Lo HP, Lo TS, Lee SJ, Wang AC. The prevalence of urinary incontinence and associated risk factors in Taiwanese women with lower urinary tract symptoms. Chang Gung Med J 2006; 29:596–601.