

Prevalence of lower urinary tract symptoms (LUTS) among young age medical population

Zalina N^a, Aruku N^b, Azura N^c, Shahida N^c, Akhmarina N^c, Dian F^c

^a Urogynaecology & Pelvic Reconstructive Unit, Department of Obstetrics & Gynecology, Kulliyah of Medicine, International Islamic University Malaysi

^b Women Pelvic Health Unit, Department of Obstetrics & Gynecology, Hospital Ipoh, Perak, Malaysia

^c Royal College Medicine of Perak, Ipoh, Perak

ABSTRACT

Introduction: Frequency of lower urinary tract symptoms (LUTS) in young age women is not well studied. It is said to be common among female elderly and multiparous population. The aim of this study is to obtain the prevalence of LUTS among nulliparous students in relation to their personal hygiene. **Materials and methods:** This is a prospective cross-sectional study conducted among 200 nulliparous medical and nursing students aged between 18-28 years using standardized questionnaires. Urine samples were also collected from students to detect urinary tract infections. **Results:** The complete data sets of 146 students were analyzed. All of them were nulliparous, single and not sexually active. The prevalence of LUTS was 52.7% consist of over-active bladder, urinary incontinence (UI) and voiding difficulty respectively (51.3%, 34.9% and 45.2%). The most common type of UI was stress urinary incontinence which was 21.9% followed by 11.6% of urgency incontinence. **Conclusion:** The prevalence of LUTS among young age population is high at 52.7%. Public awareness regarding LUTS and availability of treatment is needed.

KEYWORDS: urination disorders, stress urinary incontinence, urinary tract infection, urge urinary incontinence, young adult.

INTRODUCTION

Lower urinary tract problems are common and distressing among females.¹ Lower urinary tract symptoms (LUTS) include incontinence (stress urinary incontinence (SUI), urgency incontinence (UUI) and mixed urinary incontinence), over-active bladder (OAB), urinary storage and voiding problems. The symptoms are overlapping and urinary tract infection (UTI) needs to be excluded. LUTS is often attributed to aging and associated with age-related changes such as decreased bladder capacity or incomplete bladder emptying and loss of estrogen.² It was found that UI to be a common health problem among women even in younger age group. It is associated with poor self-esteem, impaired quality of life, social isolation, and depression.³ UI comprises 85%-90% of all cases in women and ranges from 14.7-52.0% in healthy young age group.^{4,5,6}

Several studies have explored the relationship between UI and specific variables, some of which suggest causal links between physiological changes and

incontinence. Incontinence in women is perhaps most often attributed to the effects of childbearing, ageing and hysterectomy.⁷ Women who have urinary incontinence have an increased risk for UTI and experience increased incontinence during an acute episode.⁸ Because of the paucity of epidemiological data on young age group, we aimed at evaluating the prevalence of and risk factors for LUTS in a female population with a special focus on younger age group, using a standardized questionnaire.

MATERIALS AND METHODS

This is a cross-sectional study conducted between May 2006 and June 2006. The students who were listed in the Royal College Medicine of Perak (RCMP) and the Nursing College registration book were invited to participate. Total of 200 medical and nursing students were recruited. All were nulliparous, aged between 18-29 years with or without bladder and urinary problems. The participation in this study was voluntary and subjects were free to withdraw at any time.

Subjects were interviewed using a self answered questionnaires consisting of demographic data, modified questionnaire pertaining to urinary incontinence and bladder symptoms (Table I) and assessment on personnel hygiene (Table II). Before distributing the questionnaires, the purpose of the study and contents of the questionnaires were explained to the students. Subjects were consented and confidentiality was ensured by using anonymous questionnaire. Exclusion criteria include all male students, subjects who refused to take part in the study and cases with incomplete information.

Corresponding author;

*Dr. Zalina Nusee
Urogynaecology & Pelvic reconstructive Unit,
Department of Obstetrics & Gynecology
Kulliyah of Medicine, International Islamic
University Malaysia
Jalan Hospital, Kuantan, Pahang
Tel: +6019 9880506
E-mail: drzalina@iiu.edu.my*

Table 1. Questionnaires on bladder and urinary problems

<p>1. In total, how many times do you go to the toilet in a 24-hour period?</p> <p><input type="checkbox"/> 1-6 times</p> <p><input type="checkbox"/> 7-10 times</p> <p><input type="checkbox"/> More than 10 times</p> <p>2. How often do you go to the toilet during the day?</p> <p><input type="checkbox"/> 1-4 times</p> <p><input type="checkbox"/> More than 8 times</p> <p><input type="checkbox"/> 5-8 times</p> <p>3. How often do you wake up to go to the toilet during the night?</p> <p><input type="checkbox"/> Occasionally</p> <p><input type="checkbox"/> 1-2 times</p> <p><input type="checkbox"/> 3-4 times</p> <p><input type="checkbox"/> More than 4 times</p> <p>4. Do you feel a strong and sudden urge to urinate?</p> <p><input type="checkbox"/> Never</p> <p><input type="checkbox"/> Sometimes</p>	<p>5. Does urine leak before you can get to the toilet?</p> <p><input type="checkbox"/> Never</p> <p><input type="checkbox"/> Sometimes</p> <p><input type="checkbox"/> Most of the time</p> <p>6. Do you leak urine when you laugh, sneeze, cough, jump or run?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p>7. Do you leak urine when you are asleep?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p>8. Do you have to wear any protections (eg. pads) because of your leakage problems?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p>9. Do you have pain when you urinate?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Most of the time</p>
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<p>10. Do you have to strain to urinate?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>11. Is there a delay before you can start urinate?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>12. Have you experienced incomplete urinary bladder emptying?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>13. How often do you take beverages containing caffeine (eg.coffee, tea)?</p> <p><input type="checkbox"/> 0</p> <p><input type="checkbox"/> 1-3 times</p> <p><input type="checkbox"/> 4-6 times</p> <p><input type="checkbox"/> More than 6 times</p>	<p>15. Do you smoke?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If yes how many cigarette do you smoke per day?</p> <p><input type="checkbox"/> 1 to 4 cigarettes</p> <p><input type="checkbox"/> 5 to 8 cigarettes</p> <p><input type="checkbox"/> 6 to 12 cigarettes</p> <p><input type="checkbox"/> More than 12 cigarettes</p> <p>14. Do you drink?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If yes, how many glasses do you drink per day?</p> <p><input type="checkbox"/> 1 to 3 glasses</p> <p><input type="checkbox"/> 4 to 6 glasses</p> <p><input type="checkbox"/> More than 6 glasses</p>
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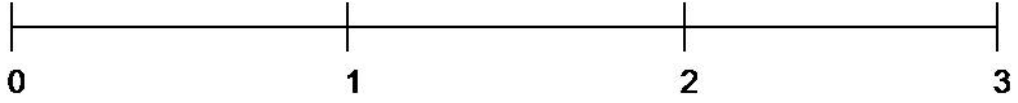
If you have urinary problem, please fill up this part. If not, please go to the next section. For following questions please use this scale;

0 - Not at all 1 - Slightly 2 - Moderately 3 - Greatly

16. Over the past month, do your urinary problems interfere with your physical activity?
(eg. swimming, jogging, walking)



17. Over the past month, do your urinary problems affect your ability to do daily task?
(eg. cooking, house cleaning, laundry)



18. Over the past month, do your urinary problems affect your social life?
(eg. meeting friends, watch movies, concert)



Table II. Questionnaires on personal hygiene

<p>1. How many times do you take your bath each day?</p> <p><input type="checkbox"/> 1-2 times</p> <p><input type="checkbox"/> 3-5 times</p> <p><input type="checkbox"/> More than 5 times</p> <p>2. Do you use vaginal douching?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>3. Do you wash the inner part of labia majora?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>4. Do you dry yourself after each urination?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If yes, what do you use to dry yourself with?</p> <p><input type="checkbox"/> Disposable towel</p> <p><input type="checkbox"/> Non-Disposable towel</p> <p>5. How many times a day do you change your underwear?</p> <p><input type="checkbox"/> No change required</p> <p><input type="checkbox"/> 1 time</p> <p><input type="checkbox"/> 2-3 times</p> <p><input type="checkbox"/> 4-5 times</p> <p><input type="checkbox"/> More than 5 times</p>	<p>6. What type of underwear do you usually wear?</p> <p><input type="checkbox"/> Cotton</p> <p><input type="checkbox"/> Synthetic (Nylon)</p> <p>7. Do you wash your underwear separately from your other clothes?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>8. Do you wash your underwear with</p> <p><input type="checkbox"/> Water only</p> <p><input type="checkbox"/> Soap</p> <p><input type="checkbox"/> Detergent powder</p> <p><input type="checkbox"/> Detergent liquid</p> <p>9. Do you wear panty liners / mini pads?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If yes, how frequent do you change your panty liners?</p> <p><input type="checkbox"/> No change required</p> <p><input type="checkbox"/> 1 time</p> <p><input type="checkbox"/> 2-3 times</p> <p><input type="checkbox"/> 4-5 times</p> <p><input type="checkbox"/> More than 5 times</p>
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10. Do you dry your underwear under the sun?

Yes No

11. Do you wash your hand during this condition?

- After using the toilet

Yes No

- Before making or eating food

Yes No

- After handling dogs or other animals

Yes No

12. How many times on average you change your pad during menstruation?

No change required

1 time

2-3 times

4-5 times

More than 5 times

13. After defecation, how do you wash and wipe your rectum and vagina?

From back to front

From front to back

14. Are you a sexually active woman?

Yes No

If yes, do you wash your rectum and vagina after sexual intercourse?

Yes No

Subjects were required to complete all sections of the questionnaires. The medical students answered English version questionnaires whereas the nursing students used the Malay version. At the end of session, each of the participants was given a urine container for urine sample for verification of UTI. The subjects were instructed to obtain an early morning urine specimen, to clean their perineum, separate the labia and collect mid stream urine. Urine specimens were transported to the laboratory and analyzed within 2 hours after collection to avoid contamination and ensure the accuracy of the result. The urine samples were analyzed using urine dipstick method and microscopic urinalysis.

Definitions

For the purpose of this study the following definitions were used: (1) UTI is defined as positive symptoms and urine analysis result (presence of more than three leukocytes, red blood cells and nitrite in an uncontaminated specimen). (2) Personal hygiene was further classified as poor (0-13 points), moderate (14-26 points) and good (27-39 points). (3) OAB is defined as ‘urgency’, with or without UUI usually with increased daytime frequency and nocturia. (4) Urinary urgency is ‘the complaint of a sudden compelling desire to pass urine which is difficult to defer’ and UUI is ‘the complaint of involuntary leakage accompanied by or immediately preceded by urgency’. (5) SUI is involuntary leakage on effort or exertion or on sneezing or coughing.⁹

Statistical test

SPSS software (version 12, Chicago, Illinois, USA) was used for statistical analysis for both quantitative and qualitative data. Independent t-test was used to compare quantitative with qualitative data. Analytical tests used were Pearson’s test to correlate between two quantitative variables and Chi-square test to compare two qualitative variables considering a significant level of $p < 0.05$.

RESULTS

The complete data sets of 146 students were analyzed. The data were obtained from 55 students in medical course and 91 students in nursing course. All of the students were nulliparous, single and not sexually active. The mean age was 21.4 years (range 18-29) and means BMI was 21.42. The majority of students (89.7%) were Malay (Table III).

LUTS symptoms were found in 77 subjects (52.7%). Majority of the participants 75 (50.7%) experience urgency and 2.7% had frequency and nocturia which can be classified as OAB symptoms (table IV). Other major symptoms include voiding dysfunction and UI respectively (45.2%, 34.9%). Eleven students (7.6%) had significant history related to LUTS including history of taking medicines for overactive bladder symptoms (e.g. Ditropan and Tofranil), surgical history (e.g. incontinence surgery) and past experience of bladder problem. Only 3 students (2.1%) with the

Table III: Demographic data

Demographic data	Case (n=146)	Frequency (%)
Age(years) :		
18-20	34	23.3
21-23	97	66.4
24-26	13	8.9
27- 29	2	1.4
Race :		
Malay	131	89.7
Chinese	4	2.7
Indian	10	6.8
Others	1	0.7
BMI:		
< 18.5	31	21.2
18.5-24.9	87	59.6
25- 29.9	25	17.1
> 30	3	2.1
On medications	2	1.4
Surgical History	3	2.1
Previous history of UTI	6	4.1

Table IV: Clinical Presentation of lower urinary tract symptoms

Symptoms	Frequency (n=77)	Percentage (%)
Day frequency (> 8 times)	2	1.4
Night frequency /nocturia (> 2 times)	2	1.4
Urgency	75	50.7
Urgency incontinence	17	11.6
Stress incontinence	34	23.3
Bed wetting	4	2.7
Incomplete emptying	60	41.1
Straining	6	4.1

*Subjects can have more than one symptom.

above history continued to have problems with either incontinence or urinary tract infection. Students without the history of LUTS had a greater percentage at 28.8% (42 students) for having bladder and urinary problems compared to those with positive past history ($p=0.099$).

Of all the 146 students involved, 11% (16/146) had positive urinalysis that potentially indicated urinary tract infections. Only 28% were symptomatic which include lower abdominal pain (15.1%), oliguria (11.6%) and dysuria (1.4%). None of the student reported haematuria. The majority of these students presented with frequent vaginal discharge (72%) and 2.7% (4/146) had yellow-greenish type of vaginal discharge.

Twenty two students (15.1%) revealed good hygiene, 124 (84.9%) were moderate and none of them found to have poor hygiene. The majority potential UTI (13/16) were in the moderate group hygiene ($p=0.664$) compared to 3 in the good hygiene group ($p=0.600$) which was statistically not significant. There were no statistically significant correlation between BMI and age with risk of UI and UTI.

DISCUSSION

LUTS is proven not only attributed to elderly, multiparity and sexually active group population but also in young age, nulliparous and those who are not sexually active. We reported a high prevalence of LUTS at 52.7% which is consistent with other studies.^{1,10,11} We diagnosed 50.7% subjects with OAB based on symptoms. OAB is a broad spectrum of symptoms, which are usually overlapping between SUI, UI, mixed incontinence and voiding dysfunction. The single most important symptom for OAB is urgency. Urodynamic test is the objective confirmatory tool to differentiate the above diagnoses.

There is distinct lack of consensus relating to the use of urodynamic assessment in the interpretation of voiding dysfunction in women. There are no universally accepted nomograms for women with outflow obstruction. Sander and colleagues prospectively looked at whether a 'minimally' urodynamic evaluation including flow rate and post void residual urine determination was helpful in identifying bladder emptying problems.¹² Out of 408 incontinence women, 43% complained of symptoms of incomplete bladder emptying, but only 6% of patients were found to have elevated PVR urine (>149 ml). Furthermore, only 1.5% of patients had clinically significant consequences arising from the abnormalities found by this test. They concluded that in a primary-care setting, health care providers could safely assess women with LUTS without these particular urodynamic studies.¹²

Women have far less voiding dysfunction compared to men. Therefore no questionnaires on the subject of voiding disorders in women have been adequately validated. In women, voiding dysfunction encompasses a heterogeneous group of patients who have difficulty

emptying their bladder, whether due to an inability of the detrusor to contract effectively (in the case of flaccid bladder), bladder outlet obstruction, detrusor-sphincter-dyssynergia, or a combination of these. For the evaluation of LUTS in female who do not have urinary incontinence symptoms, the International Incontinence Society had proposed the use of International Consultation on Incontinence Questionnaire (ICIQ)-FLUTS.¹³ A modified questionnaire (Table I) was used in our study to cater our target population with urinary incontinence.

SUI remains the predominant type of incontinence (23.3%) as shown by others which ranged between 14.7 - 52.0%.^{5,6} In a study of 4211 healthy nulliparous student nurses (17-25years), Wolin et al. found some degree of stress incontinence in 51% and daily problem with urine leakage in 16%. Similarly, Nemir and Middleton reported that of 1327 nulliparous female college students, 52% had stress incontinence, although only 5% had urine loss on regular basis.^{10,11}

There appears to be epidemiological support for the role of obesity in incontinence. Incontinence has been associated with higher body mass index and greater weight. In one study, a significant relationship was found between UI and body mass index.⁶ Women with regular incontinence have the highest body mass index and those without incontinence have the lowest body mass index. A link between body mass index and incontinence supports the concept that weight gain may increase the susceptibility to incontinence and suggests that weight loss may decrease incontinence. However we did not find such a correlation in our study subjects.

Most women with urinary incontinence can be treated by simple interventions.¹⁴ Nevertheless, many incontinent women suffer in silence. The usual reasons for not seeking help are embarrassment, believing that incontinence is a normal part of ageing and that nothing can be done and fear of surgery.¹⁵ They may be unaware of the available treatment. There is an obvious need for educating the public about incontinence.^{3,15} The same situation applies to our population as most of the symptomatic subjects did not sought medical treatment.

Symptoms of cystitis are the main key for diagnosis of uncomplicated UTI in young female population.¹⁶ Our subjects showed 11% of potentially indicated UTI without obvious classical symptoms. Vaginal discharge was the main complaint (72%) which could contribute to pyuria. It is important to consider the diagnosis of vaginitis (trichomoniasis or candidiasis) or urethritis (Neisseria gonorrhoeae or Chlamydomphila trachomatis) when evaluating female patients who have urinary tract complaints.

Nearly 50% of female patients seen in the emergency department with symptoms of cystitis were found to have sexually transmitted disease.¹⁷ Many diseases of the urinary tract produce significant pyuria without

bacteriuria. These include staghorn calculi, tuberculosis, and infections caused by Chlamydia and Mycoplasma spp.

Hydrodynamic factors by flushing out the contaminated urine and practice good personal hygiene has been associated with a reduction in the incidence of UTI.¹⁰ However Krienger in his data did not support this classic teachings involving increased water intake, direction of wiping, cranberry juice, and voiding promptly after intercourse.¹⁸ We also did not find correlation between personal hygiene and risk of UTI which is consistent with Krienger's data.

Because urine cultures are expensive, we decided to analyze our urine sample using urine dipstick method and microscopic analysis only. There have been evaluations to find a more cost-effective method of detecting bacteriuria. It is well known that pyuria is not always present in bacteriuria, nor is it specific for bacteriuria. McNair and colleagues reported a 53% false negative rate with dipstick screening of nitrite and leukocyte esterase in pregnant patients.¹⁹ Conversely, Hurlbut et al. reported dipstick urinalysis that shows presence of either leukocyte esterase or nitrites is highly predictive of a positive urine culture, whereas absence of both findings markedly reduces the likelihood.^{14,20} A negative dipstick urinalysis is sufficient to rule out UTI in most cases for otherwise healthy women of reproductive age. The use of dipstick urinalysis improves physicians' diagnostic accuracy and can reduce antibiotic prescribing compared with history and physical examination alone.²¹ Given the increased cost and time involved in performing a formal microscopic analysis, the urine dipstick is the screening test of choice in most scenarios to make the diagnosis of UTI.²²

Several problems had occurred in this study which could affect the results. These include small sample size because many students refused to participate in this study. The reasons were; doubtful of the confidentiality of the study, some claimed the questionnaires were too personal, many of them refused to give urine sample and few did not answer the question completely. There could be some dishonesty in answering personal questions. The study was non representative of the population as respondent could be those who have LUT problems who were trying to know more about their problems.

CONCLUSION

The prevalence of LUTS among young age group female medical population is high at 52.7%, the symptoms mainly of OAB and voiding dysfunctions. The risk of UTI and UI did not correlate with the personal hygiene, BMI and age. Public awareness regarding LUTS and the availability of treatment is necessary to reduce the problems.

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