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The prevalence of urinary incontinence in American Indian women from a South Dakota tribe

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Abstract

Introduction and hypothesis—The purpose of this pilot study was to evaluate the prevalence and associated risk factors for urinary incontinence in a Northern Plains tribe of American Indian women.

Methods—The Urogenital Distress Inventory-Short Form was used to assess urinary incontinence in a sample of American Indian women from one tribe. This was a cross-sectional convenience sampling of 234 eligible participants. Participant's ages ranged from 18 to 80 years. Stata/Se 9.1 software was used in statistical analysis.

Results—The overall prevalence of urinary stress incontinence was 15.4%, urgency incontinence 2.14%, and mixed incontinence 20.5%. Both stress and urgency incontinence was found to be low in this sample population.

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The Abstract of this work was presented as a "Poster" at the International Urogynecology Association meeting in June 2009 and at the American Urogynecology Society meeting in September 2009.

Conflicts of interest

Dr. K.D. Benson has been a speaker for Astellas and instructor for Medtronic. The other authors have none to declare.

Conclusions—A reduced prevalence of stress and urgency incontinence is seen in our sample. Our study group showed a high prevalence of known risk factors associated with urinary incontinence. We intend to extend our study for further understanding of this patient population.

Keywords

American Indian women; National Health and Nutrition Examination Survey; Urinary incontinence

Introduction

Urinary incontinence (UI) represents a collection of debilitating symptoms affecting million of people worldwide and resulting in billions of dollars expended by the respective health care systems. The International Continence Society has provided specific definitions of all lower urinary tract dysfunctions [1].

Epidemiological and clinical studies have been conducted in various populations and have revealed risk factors and contributing variables for UI and other lower urinary tract symptoms (LUTS) [2, 3]. Well-documented risk factors for UI include age, parity, and obesity as well as other risk factors including smoking, menopause, restricted mobility, chronic cough, chronic straining due to constipation, and previous urogenital surgery [4, 5]. Data on risk factors contributing to the incidence of UI, remission, and the natural history of LUTS are limited and have been derived mainly from cross-sectional studies [6]. This limits generalizations and restricts interpretation of etiology [3, 4].

This pilot study was initiated to determine the prevalence of urinary incontinence and associated risk factors in a population of American Indian women. This group of women has not been previously studied relative to the medical issue of urinary incontinence.

Materials and methods

This pilot study was approved by tribal and institutional review boards, and all subjects gave written informed consent prior to participation. Participants were recruited for the study at the local Indian Health Service (IHS) and through “word of mouth” from other community members. The IHS center represents a gathering place for the tribe, with many different events of interest occurring there. With the cooperation of tribal health administration and IHS, a survey center was set up in the foyer of the IHS facility. From June to September of 2008, the questionnaire was administered by a local nursing student, who was a member of the tribe, at the IHS facility. The nursing student had been educated on the nature and substance of the questionnaire. Her involvement with each participant was to first provide the questionnaire and second to be available to answer questions which may arise during completion of the survey. When questionnaires were returned to the nursing student, she reviewed them to confirm that each question had been answered by each participant. When a question had not been answered, it was typically because the participant was uncertain of how to answer. The nursing student would then offer explanation of the specific question or questions unanswered for the participant so that all questionnaires she collected were fully completed.

Inclusion criteria for participation in the study required that subjects were female, at least 18 years of age or older, and American Indian. Pregnant patients were excluded due to the temporarily increased incidence of stress urinary incontinence in this group [7]. All women expressing an interest in participation were allowed to enroll and answer the questions. This was allowed so as not to discourage others from participating.

The Urogenital Distress Inventory (UDI-6) Short Form was chosen for use in this pilot study to assess urinary incontinence symptoms and establish the demographic features of this sample. In addition to determining the subtype of urinary incontinence, the UDI-6 provides data on the degree to which symptoms associated with urinary incontinence are troubling to women. Previous research has evaluated the UDI using test–retest reliability and concurrent and construct validity [8]. The scale for severity of urinary incontinence ranges from 0 to 3, with “0” indicating no incontinence, “1” a little bit, “2” moderate, and “3” greatly bothered by urinary symptoms and involuntary urine loss.

The UDI short form (UDI-6) was developed to improve compliance in the completion of this form. The original 19-item questionnaire was changed to a six-item questionnaire after a regression analysis identified six subsets of questions that best approximated scores of the long-form versions [9]. Data on the reliability and validity of the UDI-6 demonstrated that it is psychometrically strong and can be self-administered [9]. In addition, positive responses to subscale questions (obstruction, stress incontinence, or bladder overactivity) are correlated with a corresponding diagnosis of incontinence [10]. There is a high correlation between a decreased UDI-6 score and an actual decrease in incontinence episodes ($p<0.001$) [8].

In addition to the six questions of the UDI-6, the survey included various demographic questions (i.e., age, race) and questions targeted at urinary incontinence risk factors, including BMI (weight in kilograms/height in square meters), history of diabetes, urinary tract infections, pregnancy history, substance use, and smoking status. Because the UDI-6 questionnaire had not been previously used in this American Indian population, a committee that included tribal members was formed to evaluate this study tool for ethnocentricity. This committee suggested we provided the definitions of stress and urge incontinence for each participant to refer to as they filled out the questionnaire. They felt that these terms were unfamiliar to these women and that the definitions should be provided for them. These definitions are presented as Table 1. Importantly, the content and the substance of the questions asked in the UDI-6 form remained unchanged. To make the form more culturally sensitive to American Indian women, the form had Native American art and pictures imbedded with it. Figure 1 identifies the UDI-6 form as it was utilized in this study.

The completed surveys were sent from the tribal site to a collaborating research center for data entry and analysis. Any individual that scored positive on the UDI had their entire survey individually reviewed by the two physician investigators. The investigators assigned an initial diagnosis of pure stress incontinence, pure urge incontinence, or mixed stress/urge incontinence from review of the UDI-6 forms. When women answered question 12b, a response of 2 or 3 would identify a women with urge incontinence. A response to question

12c of 2 or 3 would generate an assignment of pure stress incontinence. If questions 12b and 12c were both answered with 2 or 3, they were assigned to the mixed incontinence group.

MINITAB (Student release 14, Belmont, CA, USA) was utilized for descriptive statistics and for establishing means and confidence intervals for demographic data to characterize the patient population. Statistical analyses were performed using Stata/Se version 9.1 (Statistical Software: Release 9, College Station, TX, USA). Women from each incontinence group were compared with the remaining sample as follows: Categorical variables (i.e., type II DM, cigarette smoking) were compared using the chi-square test. Fisher's exact test was used if one or more cell counts were <5 (i.e., urge incontinence group). Continuous variables (i.e., age and BMI) were compared using a two-sample t test. Parity was compared between each incontinence group and the remaining sample using the chi-square test.

Results

A total of 279 participants provided completed questionnaires; 45 participants were excluded because they were not American Indian ($n=27$) or were pregnant ($n=18$). A total of 234 eligible participants remained, and their questionnaires were evaluated. The average age was 42.7 (± 13.8) years with a range of 18–80, BMI was 30.6 (± 6.6) with a range of 17.9–51.8, and average parity was 3 (± 2.02) with a range of 0–12. Type II diabetes and cigarette smoking were reported in 25.8% and 49.4%, respectively, of the study group. In addition, almost 75% of respondents reported a previous vaginal delivery.

These health characteristics are highlighted because they are known risk factors for urinary incontinence. Overall, the average BMI in this sample fell within the obese category. The average parity [3] in the study group is higher than reported in the general population [11]. Type II diabetes and smoking were both much higher in this study group than seen in the general population [12].

Women classified as having mixed incontinence were older than women who did not have mixed incontinence (53.2 ± 12.5 years versus 40.0 ± 12.7 , $p < 0.001$) had a higher BMI (33.3 ± 6.3 kg/m² versus 29.9 ± 6.5 , $p = 0.0013$) and were more likely to have type II diabetes (77.8% with diabetes versus 27.4%, $p = 0.002$). All other comparisons of incontinence group (i.e., urge and stress) to the remaining sample were not significant. We found a statistically significant relationship between parity and mixed incontinence (chi-square with 12 degrees of freedom = 45.0, $p < 0.001$). As parity increased, the number with mixed incontinence increased.

The overall frequency of moderate and severe urinary stress incontinence was 15.4%, urgency incontinence was 2.14%, and mixed incontinence was 20.5% based on the UDI-6 responses. Table 2 provides demographic characteristics and results of the breakdown of urinary incontinence by type. These data showed that the women in the mixed incontinence group were more likely to show a significant increase in Age, BMI, and incidence of type II diabetes when compared to the remainder of the study population.

Discussion

The prevalence of urinary incontinence has been studied throughout the world in various populations, including the (Chinese, Taiwanese, South Korean, Egyptian, Turkish, Thai) [13–18] and US Caucasian, African American, and Hispanic-American women [19–23]. Differences in prevalence, quantity, and type of urinary incontinence have been seen in the USA between African American and Caucasian women, although the frequency of risk factors for urinary incontinence was generally similar in these two populations [21]. In a prospective, randomized cohort study provided by Thom et al., the RRISK study, they established the prevalence rates of urinary incontinence in White, Black, Hispanic, and Asian-American women in a northern California region [24]. The same data on UI are unavailable for American Indian women because they have not been included in urinary incontinence research.

The primary objective of this study was to assess the prevalence of urinary incontinence and associated contributing risk factor in American Indian women in one Midwestern tribe. Our results indicated that the frequency of stress urinary incontinence and urgency incontinence in American Indian women in this pilot study is low.

Based on a cross-sectional survey of American Indian women from one tribe, these results have shown that although American Indian women may have certain risk factors for urinary incontinence, they have similar rates of mixed urinary incontinence and their rates of stress and urge urinary incontinence are lower than that reported in other studies [4–6, 10, 20].

Mixed incontinence in our study shows a similar prevalence as is reported by other studies [3, 11, 15]. The Native American subjects in our study with mixed incontinence had an increased incidence of type II diabetes ($p<0.002$), increased BMI ($p<0.0015$), and advanced age ($p<0.001$) when compared to the remainder of the study population. There was also a statistically significant relationship between mixed incontinence and parity (chi-square with 12 degrees of freedom=45, $p<0.001$) in the American Indian sample. Type II diabetes, cigarette smoking, age, BMI, or parity was not found to be significantly different in women with stress or urge incontinence in this group.

This sample of American Indian women had several risk factors for urinary incontinence that should be further evaluated in a larger, random sample accompanied by clinical evaluation to confirm the actual prevalence of urinary incontinence in American Indian women. Some limitations of this study include a cross-sectional, convenience sample of American Indian women from one tribe, limiting the generalization of the results to American Indian women as a whole and preventing a full comparison with rates of urinary incontinence in other populations. The small sample size also limits the conclusions we can draw from this investigation. Our study was designed only as a pilot effort and as an initial attempt to understand better this disease process within this ethnic group. Specific areas such as genetic factors and obstetric events have not only been addressed in this preliminary study but may also be contributing variables to the findings reported here.

Further study of urinary incontinence in this group of Native American women is about to be initiated. In a prospective study, we plan to further evaluate the types of incontinence in

this group of women using additional study tools while incorporating clinical confirmation of incontinence type for each participant. Those Native American women identified with incontinence will then receive evidence-based medical therapy for their specific condition. Hopefully the identification and treatment of these conditions in this underserved group of women will improve their quality of life.

Acknowledgments

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Subject ID: _____

Urinary incontinence refers to the unintentional, uncontrolled release of urine. Commonly, this happens during a cough, laugh or sneeze, or when you have the urge to urinate but can't reach a bathroom in time.

An estimated 17 million women in the U.S. cope with urinary incontinence. There have been studies on incontinence with women from all over the world. Unfortunately, no studies have been done with American Indian women, so we don't know how American Indian women are affected by incontinence. The purpose of this survey is to help us understand the issue of incontinence with American Indian women.

General Information:

1. Age: _____
2. Race (check all that apply):

☐ American Indian or Alaska Native	☐ Native Hawaiian or other Pacific Islander
☐ Asian	☐ White
☐ Black or African American	☐ Other (please specify): _____
3. Height: _____ (feet) _____ (inches)
Weight: _____ (pounds)
4. Are you currently pregnant? ☐ No ☐ Yes—PLEASE SKIP TO QUESTION 17

Health History:

Health issues such as diabetes, urinary tract infections, problems with your kidneys, or a history of stroke can increase the chance you will be affected by urinary incontinence. Please check "yes" or "no" if you have been affected by these issues.

5. Have you ever been diagnosed with diabetes?	☐ Yes	☐ No
6. Have you ever had a stroke?	☐ Yes	☐ No
7. Have you ever been diagnosed with a urinary tract infection?	☐ Yes	☐ No
8. Have you ever had problems with your kidneys?	☐ Yes	☐ No

Pregnancy History:

Some women find that they are affected by incontinence after having a baby, which is why we are asking questions about pregnancy and delivery.

9. How many times have you been pregnant? _____
10. How many times have you given birth? _____

a. Have you ever had a C-Section?	☐ Yes	☐ No
b. Have you ever had a vaginal delivery?	☐ Yes	☐ No
c. Did the doctors ever have to use forceps?	☐ Yes	☐ No

Substance Use:

While not a direct cause of incontinence, smoking and drinking alcohol may make incontinence worse.

11. Do you smoke cigarettes now?

☐ Yes: About how many per day? _____ (number of cigarettes per day)
☐ No
12. Do you drink alcohol now?

☐ Yes: About how much per week? _____ (number of drinks per week)
☐ No

Types of Urinary Incontinence.

There are different types of urinary incontinence. "Stress" and "Urge" Incontinence are the two most common types of incontinence.

Stress Incontinence

Stress incontinence is an involuntary loss of urine that occurs during physical activity, such as coughing, sneezing, laughing, or exercise. This condition can be worsened by smoking, being overweight, or during menopause.

Urge Incontinence

When you hear the phrase "overactive bladder," it's normally describing the condition of urge incontinence. Urge incontinence involves a strong, sudden need to urinate, followed by a bladder contraction, which results in leakage.

13. On a scale of 0 to 3 (0 being not at all and 3 being greatly), please circle the answer that best applies to you.

Do you experience and, if so, how much are you bothered by:

	Not at all	A little bit	Moderately	Greatly
a. Frequent urination	0	1	2	3
b. Urine leakage related to urgency (feeling like you have to go to the bathroom and then not making it in time)	0	1	2	3
c. Urine leakage related to physical activity (laughing, coughing, sneezing, exercise, bending over)	0	1	2	3
d. Small amounts of urine leakage (like a little bit that you can't hold before you make it to the bathroom)	0	1	2	3
e. Difficulty emptying your bladder	0	1	2	3
f. Pain or discomfort in the lower abdomen or in your private parts	0	1	2	3

14. Do you feel that you are currently affected by urinary incontinence, or the inability to control your bladder? For example: You don't feel confident leaving the house or attending activities where a bathroom may not be available. It could also be that you feel like you're affected by incontinence, but only once in awhile.

☐ Yes: For how long? _____ number of years (OR) _____ number of months
☐ No

15. Do you feel like you have to wear protection for incontinence, like a panty liner or Depends?

☐ Yes: How often (check one)? _____ Everyday (OR) _____ Occasionally (OR) _____ Rarely
☐ No

16. Have you ever had surgery for urinary incontinence?

☐ Yes: How long ago? _____ number of years (OR) _____ number of months
☐ No

17. If you were to receive surgery or other treatment for urinary incontinence, where would you rather be seen for services?

☐ Indian Health Service
☐ In a non-IHS facility, such as a hospital in Sioux Falls

Fig. 1.

Two-page questionnaire which has incorporated Native America art and definitions of both stress and urge incontinence

Table 1**Definitions of incontinence**

Types of urinary incontinence

There are different types of urinary incontinence. “Stress” and “Urge” incontinence are the two most common types of incontinence.

Stress incontinence

Stress incontinence is an involuntary loss of urine that occurs during physical activity, such as coughing, sneezing, laughing, or exercise. This condition can be worsened by smoking, being overweight, or during menopause.

Urge incontinence

When you hear the phrase “overactive bladder,” it’s normally describing the condition of urge incontinence. Urge incontinence involves a strong, sudden need to urinate, followed by a bladder contraction, which results in leakage.

These definitions were placed above the UDI-6 forms to allow our participants to fully understand the questions

Table 2

Demographics of IHS incontinence study

Demographics and comparison of incontinence groups						
All participants	Stress incontinence	Urge incontinence	Mixed incontinence			
<i>n</i> =234	<i>n</i> =36	<i>n</i> =5	<i>n</i> =48	<i>p</i> value	<i>p</i> value	<i>p</i> value
Age (years)	42.7 (±13.8)	42.3 (±11.6)	44.2 (±5.9)	NS	53.2 (±12.5)	<0.001 ^a
BMI	30.6 (±6.6)	31.7 (±6.7)	32.0 (±7.3)	NS	33.3 (±6.3)	<0.0015 ^a
Type II diabetes	25.8%	33.3%	60.0%	NS	43.8%	<0.002 ^a
Cigarette smoking	49.4%	41.7%	60.0%	NS	45.8%	NS

^aWomen from each incontinence group were compared with the remaining sample as follows: categorical variables (i.e., type II DM, cigarette smoking) were compared using chi-square test. Fisher's exact test was used if one or more cell counts were <5 (i.e., urge incontinence group). Continuous variables (i.e., age and BMI) were compared using a two-sample *t* test