

Self-Reported Prevalence of Urinary Tract Infections Among Individuals with Type 2 Diabetes Mellitus

Susan Grandy¹, Kathleen M. Fox², for the SHIELD Study Group

¹AstraZeneca LP, Wilmington, DE, USA; ²Strategic Healthcare Solutions, LLC, Monkton, MD, USA

BACKGROUND

- Uncomplicated UTI is the most common bacterial infection encountered in clinical practice¹
- Approximately half of all women will have at least 1 symptomatic UTI during their lifetime^{2,3}
- About 20% of all UTIs occur in men⁴
- Diabetes has been associated with an increased risk of UTI⁵
- Patients with diabetes often have increased complications of UTI, including rare complications, fungal infections, and increased severity and unusual manifestations⁶
- Yet, there is limited information on the prevalence of UTI in diabetes and whether UTIs are more common among adults with T2DM than those without diabetes

OBJECTIVES

- To estimate the prevalence of self-reported UTI among individuals with and without T2DM
- To assess age and gender differences in rate of UTI among individuals with T2DM
- To determine whether adults seek medical care for the UTIs

METHODS

Study Design

- Cross-sectional analysis of data collected in 2008 among SHIELD respondents with or without T2DM
- Study to Help Improve Early evaluation and management of risk factors Leading to Diabetes (SHIELD) is a 5-year population-based survey conducted to better understand the risk for the development of diabetes, as well as disease burden
 - Based upon a screening questionnaire mailed to 200,000 nationally representative households (TNS NFO Household Panel), responses for 211,097 adults from 127,420 households were obtained (64% response rate)
 - A baseline survey was sent in 2004 to 22,001 selected individuals derived from the screening respondents. Since 2005, annual SHIELD surveys have captured self-reported information on health status, attitudes and behaviors, quality of life, and anthropometry from this representative sample of the US population
 - The 2008 survey collected information from 14,921 individuals (71% response rate)

Study Population

- Respondents were 18 years of age or older
- Self-reported diagnosis of T2DM was based on being "told by a doctor, nurse or other healthcare professional that you have type 2 diabetes"
- Individuals who did not report a diagnosis of T2DM, T1DM, or gestational diabetes were included as a comparison group

Study Measures

- Respondents were asked how many times in the past 12 months they had a UTI
- Respondents were also asked to report the number of times they consulted with their doctor and/or nurse regarding a UTI and the number of times they treated the UTI themselves
- Overweight was defined as BMI of 25.0–29.9 kg/m², and obese was defined as a BMI ≥30 kg/m²
- Comorbid conditions were self-reported based on survey questions of being told by a healthcare professional that they had the condition

Statistical Analyses

- Respondents with T2DM were compared with respondents who did not report diabetes on the occurrence and frequency of UTIs
- Comparisons between respondents with and without reported diabetes were conducted using chi-square test for categorical variables and *t*-tests for continuous variables
- Logistic regression was used to adjust for age and gender
- Statistical significance was set *a priori* as *p* <0.05

RESULTS

- There were 2,671 respondents with T2DM and 8,907 respondents without diabetes who responded to the UTI survey questions

Table 1. Characteristics of respondents with and without diabetes

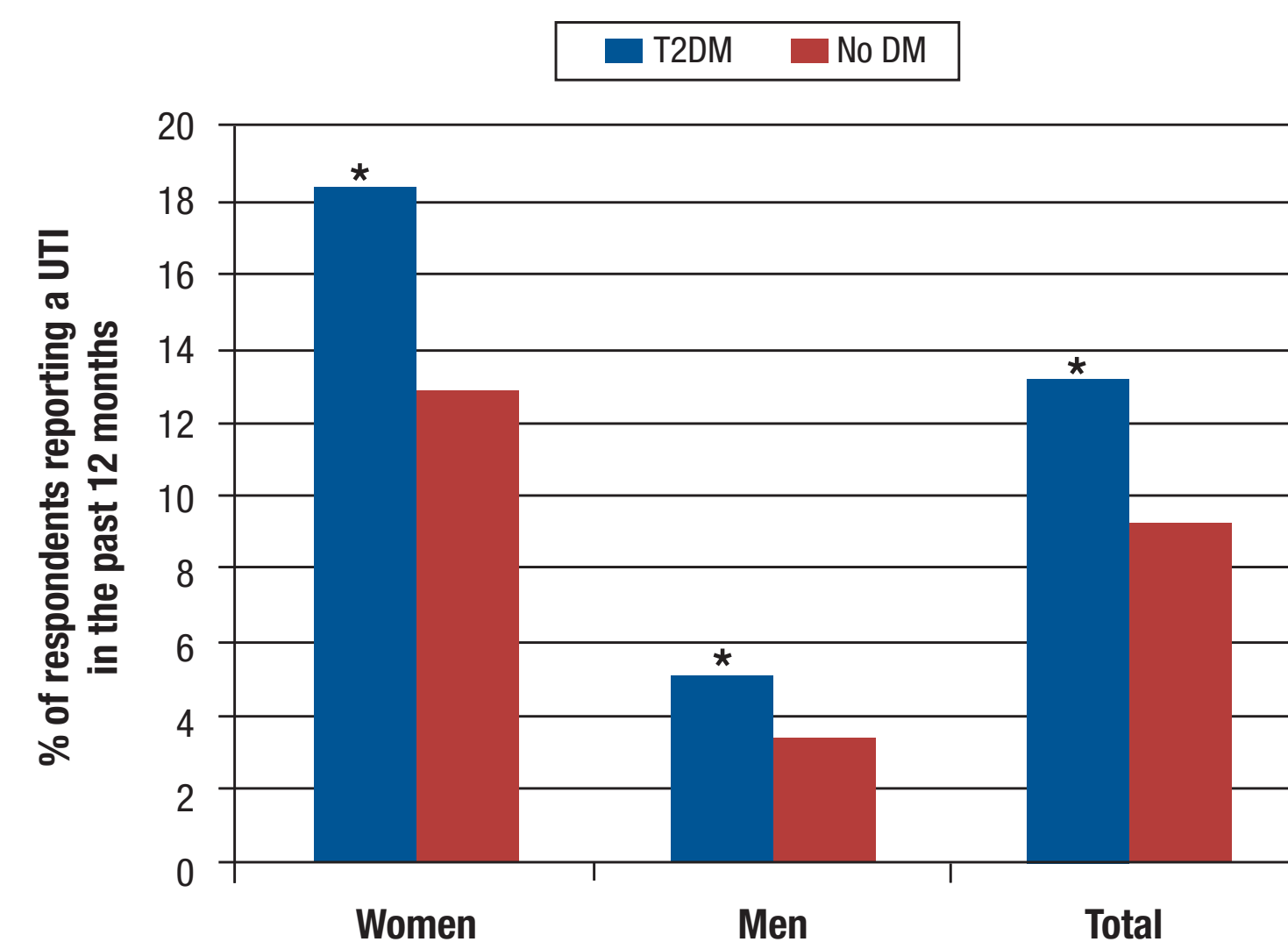
Characteristics	T2DM (n = 2,671)	No Diabetes (n = 8,907)
Age, years, mean (SD)	63.1 (11.7)*	56.9 (15.5)
Women, %	60.3	62.3
White, %	73.7*	67.0
Education, high school degree or less, %	34.1*	28.2
Household income, <\$30,000, %	36.2*	27.9
Overweight or obese, %	89.9*	75.6
Number of comorbid conditions, mean (SD)	5.3 (3.1)*	3.3 (2.7)
Atherosclerosis, %	9.1*	4.7
Cholesterol problem, %	74.5*	46.5
Heart disease, %	24.0*	12.9
Hypertension, %	72.4*	45.4

**p* <0.05

- A significantly larger proportion of T2DM respondents were older, white, had lower education and income, were overweight or obese, and had more comorbid conditions, than those without diabetes (Table 1)

Prevalence of UTI

Figure 1. Respondents reporting a UTI by diabetes status and gender

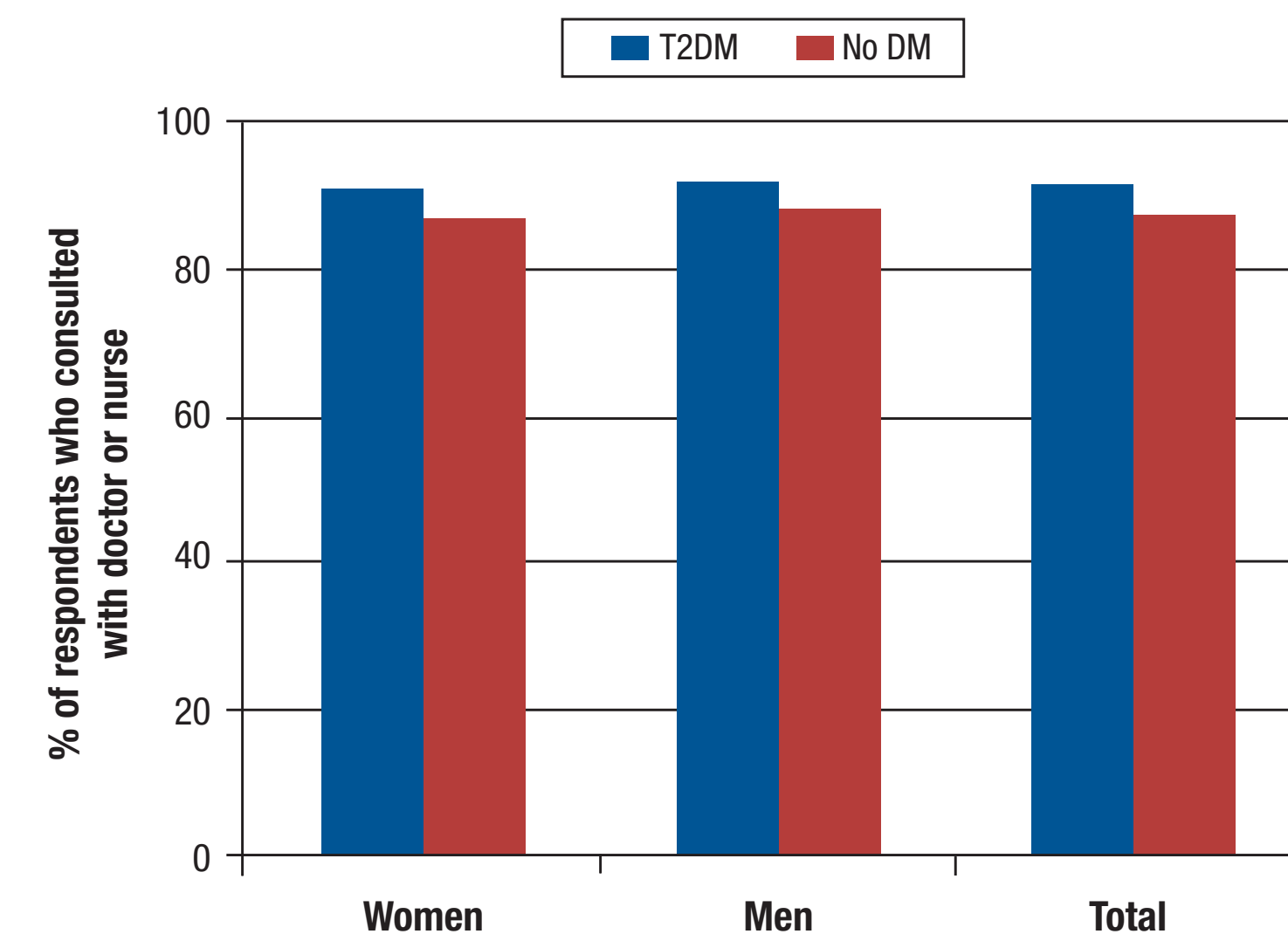


**p* <0.01 for comparison between T2DM and No DM

- Among women, 18.4% of those with T2DM, compared with 12.8% of those without diabetes, reported at least 1 UTI (*p* <0.001) (Figure 1). The prevalence rate of UTI for women was 184.4 per 1,000 people for those with T2DM and 127.8/1,000 for those without diabetes
- Among men, 5.1% of those with T2DM, compared with 3.4% of those without diabetes, reported at least 1 UTI (*p* = 0.01) (Figure 1). The prevalence rate of UTI for men was 50.9 per 1,000 people for those with T2DM and 33.9/1,000 for those without diabetes
- Overall, 13.1% of respondents with T2DM and 9.2% of respondents without diabetes reported at least 1 UTI in the past 12 months
- A higher proportion of women with T2DM than men with T2DM reported at least 1 UTI (*p* <0.01)

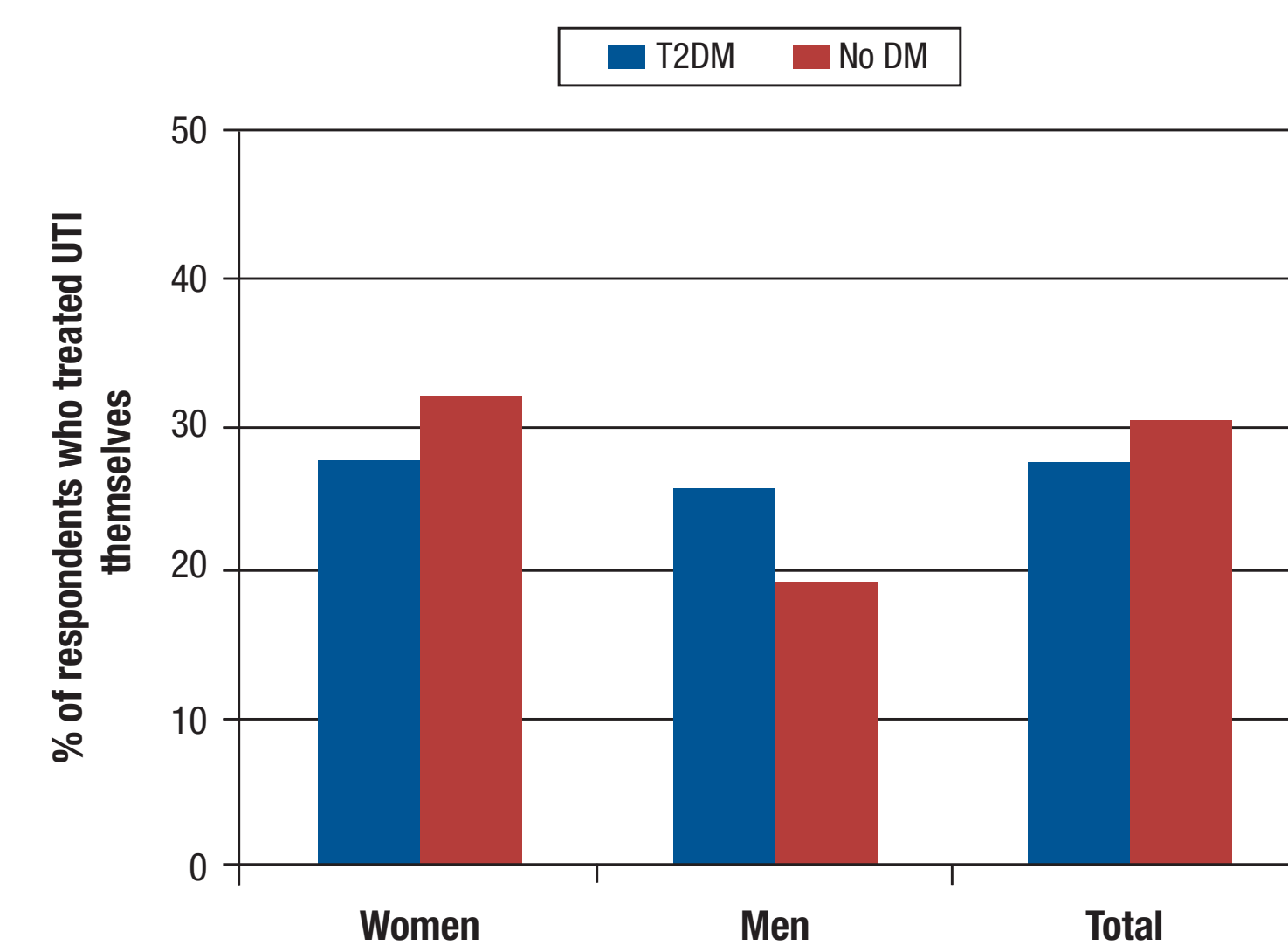
Consulted with Health Professional about UTI

Figure 2. Respondents who consulted their doctor or nurse regarding a UTI



- Among those who reported ≥1 UTI, 87%–92% reported that they had consulted their doctor or nurse about the UTI (Figure 2)
- There was no difference in the proportion consulting their healthcare professional about a UTI between those with and without diabetes

Figure 3. Respondents who reported treating the UTI themselves



- Among those who reported ≥1 UTI, 19%–32% reported that they had treated a UTI themselves (Figure 3)
- There was no difference in the proportion self-treating a UTI between those with and without diabetes. No difference was found in the proportion self-treating a UTI between men and women with T2DM

Table 2. Odds ratio of having a UTI in the past 12 months, adjusting for age group and gender

Characteristics	Odds ratio (95% CI)	P value
T2DM (No DM as reference group)	1.54 (1.34–1.76)	<0.0001
Age group 50–59 (age group <50 years as reference group)	0.95 (0.80–1.23)	0.54
60–69 years	0.90 (0.75–1.08)	0.27
70–79 years	1.08 (0.90–1.32)	0.40
≥80 years	1.52 (1.21–1.90)	<0.0001
Women (men as reference group)	4.24 (3.58–5.02)	<0.0001

- Odds of having at least 1 UTI were 1.5 times higher among T2DM respondents than No DM respondents, after adjusting for age and gender (Table 2)
- Women were 4.2 times more likely than men to have at least 1 UTI, after adjusting for diabetes status and age
- Elderly (≥80 years of age) respondents were more likely than younger (<50 years of age) respondents to have a UTI, after adjusting for diabetes status and gender. Other age groups were not associated with increased odds of having a UTI compared with those <50 years of age

LIMITATIONS

- Diagnosis of diabetes, other comorbid conditions, and UTI were self-reported and could not be validated with medical record review or administrative claims data. However, this bias is similar between the groups compared in this study
- Household panels, like the TNS NFO panel, tend to under-represent the very wealthy and very poor segments of the population and do not include military or institutionalized individuals

CONCLUSIONS

- UTIs were more prevalent among respondents with T2DM, compared with respondents without diabetes
- UTIs were more frequent among women with T2DM, compared with men with T2DM and men without diabetes
- Elderly respondents were more likely than younger respondents to have a UTI
- Future research about risk factors for UTI other than age and gender among individuals with diabetes may allow evidence-based information to be used in the management of infections

REFERENCES

- Platt FW, Keating KN. *Int J Clin Pract* 2007;61:303–308
- Kunin CM. *Clin Infect Dis* 1994;18:1–12
- Engel JD, Schaeffer AJ. *Urol Clin North Am* 1998;25:685–701
- Griebing TL. *J Urol* 2005;173:1288–1294
- Foxman B. *Am J Med* 2002;113 (Suppl 1):5–13
- Stapleton A. *Am J Med* 2002;113 (Suppl 1):80–84

LIST OF ABBREVIATIONS

BMI	Body mass index
DM	Diabetes mellitus
SHIELD	Study to Help Improve Early evaluation and management of risk factors Leading to Diabetes
T1DM	Type 1 diabetes mellitus
T2DM	Type 2 diabetes mellitus
TNS NFO	Taylor Nelson Sofres National Family Opinion
UTI	Urinary tract infection

This research was supported by funds from AstraZeneca LP.

Presented at the American Public Health Association 138th Annual Meeting, Denver, CO, November 6–10, 2010