

# Survey on the Perception of Urogenital Complications in Diabetic Patients

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**Purpose:** Retinopathy, neuropathy, and nephropathy are well-known complications of diabetes; they are often expected to occur and, therefore, are usually tested for. However, urogenital complications, such as sexual and voiding dysfunctions, are less well known, and consequently, many patients are not treated appropriately despite their symptoms. Thus, we surveyed diabetic patients with regard to their perception of urogenital complications.

**Materials and Methods:** We designed a survey for patients in our hospital who were being treated for diabetes mellitus (DM). The questionnaire included items on age, sex, treatment duration, treatment options for and the level of perception of urogenital symptoms, the presence of urogenital symptoms, and whether treatment was intended or had been initiated.

**Results:** In total, 275 patients participated in the survey. The perception questions on DM-associated urogenital complications showed that 89 patients (32.4%) had no knowledge, 84 patients (30.5%) had some knowledge, and 102 patients (37.1%) had detailed knowledge about these complications. A total of 124 patients (45.1%) reported urogenital symptoms: 93 patients (75.0%) reported voiding dysfunction and 61 patients (49.2%) reported sexual dysfunction. Common symptoms of voiding dysfunction were urinary frequency, nocturia, sense of residual urine, weak stream, and urinary incontinence. Common symptoms of sexual dysfunction were reduced libido, and erectile and ejaculatory dysfunction.

**Conclusions:** The survey showed that the subjective prevalence rate of urogenital symptoms in diabetic patients was 45.1%. However, only a small percentage (37.1%) of the patients cognized that these symptoms were associated with DM. Therefore, it is necessary to properly inform and educate diabetic patients on possible urogenital complications that may occur.

**Key Words:** Diabetes mellitus, Complications, Urogenital system

## INTRODUCTION

Diabetes mellitus (DM) is one of the most common chronic diseases with a gradually increasing prevalence in Korea. DM is associated with an earlier onset and in-

creased severity of urologic diseases, resulting in costly and debilitating urologic complications. Urologic complications such as sexual and voiding dysfunctions have a profound effect on the quality of life of diabetic patients.<sup>1</sup> Knowledge about the complications that are associated

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with DM has also gradually progressed. However, urogenital disorders are less well-known complications, and therefore, many patients do not receive adequate or appropriate treatment despite their symptoms. Thus, we performed a survey on diabetic patients to assess their perception and the prevalence rate of DM-associated urogenital complications.

## MATERIALS AND METHODS

Between March and September 2009, we conducted a survey that included questions on urogenital complications with patients who were being treated for DM at Korea University Guro Hospital. Approval for this study was obtained from the Institutional Review Board at the hospital and informed consent was obtained from each patient. Urologists and endocrinologists participated in developing a simple questionnaire on symptoms and perceptions. The questionnaire included items on age, sex, treatment duration, treatment options for and the level of perception of urogenital symptoms, the presence of urogenital symptoms, and whether treatment was intended or had been initiated. A total of 275 patients agreed to participate and joined the study.

Each measurement value was recorded as a mean  $\pm$  standard deviation. Student's *t*-tests and Pearson's correlation tests were used for statistical analyses. A *p* value of  $<0.05$  was considered to be statistically significant. All statistical tests were performed using the SPSS program ver. 13.0 (SPSS Inc., Chicago, IL, USA).

**Table 1.** Patient characteristics

Age (yr)	61.5 $\pm$ 9.4
Sex	
Male	143 (52)
Female	132 (48)
Treatment duration (mo)	106.0 $\pm$ 87.5
Treatment	
Oral medication	185 (67.3)
Insulin	45 (16.4)
Insulin + oral medication	25 (9.1)
Others	20 (7.2)

Data are represented as the mean  $\pm$  standard deviation or number (%).

## RESULTS

### 1. Patient characteristics

In total, 275 patients completed the questionnaire. The average age was 61.5 years (range, 37 ~ 83 years), 143 patients (52.0%) were male and 132 patients (48.0%) were female. The average duration of treatment was 106 months (range, 1 ~ 390 months). The survey revealed that 185 patients (67.3%) were receiving oral medication, 45 patients (16.4%) were receiving insulin therapy, and 25 patients (9.1%) were receiving a combination of insulin and oral therapy (Table 1).

### 2. Survey data

With regard to the level of perception of DM-associated urogenital complications, 89 patients (32.4%) had no knowledge ("have no idea"), 84 patients (30.5%) had some knowledge ("heard but do not know in detail"), and 102 patients (37.1%) had detailed knowledge ("know them") about the associated complications.

Of all the patients in the study, 124 (45.1%) complained of urogenital symptoms: 93 patients (75%) reported voiding dysfunction and 61 patients (49.2%) reported sexual dysfunction. Thirty patients (10.9%) complained of both of them. Common symptoms of voiding dysfunction were urinary frequency (57 patients, 61.3% of 93 patients), nocturia (47 patients, 50.5%), sense of residual urine (32 patients, 34.4%), weak stream (22 patients, 23.7%), and urinary incontinence (6 patients, 6.5%). Common symptoms of sexual dysfunction were a reduced libido (44 patients, 72.1% of 61 patients), erectile dysfunction (33 patients, 54.1%), and ejaculatory dysfunction (20 patients, 32.8%) (Table 2).

### 3. Analysis of survey data

Comparison of the levels of perception according to sex showed that male patients were significantly more aware of urogenital complications than female patients (68.0% vs. 32.0%;  $p=0.001$ ). In addition, male patients were also significantly more likely to report urogenital symptoms than female patients (63.0% vs. 37.0%;  $p=0.001$ ).

Pearson's correlation test showed that the duration of DM and the perception of complications were positively correlated ( $r=0.83$ ;  $p<0.001$ ). In addition, the duration of

**Table 2.** The questionnaire

Question	Answer	Number (%)
Are you familiar with DM-associated urogenital complications?	Have no idea	89 (32.4)
	Heard but do not know in detail	84 (30.5)
	Know them	102 (37.1)
Do you have urogenital symptoms?	Yes	124 (45.1)
	No	151 (54.9)
What kind of symptoms do you have?	Voiding dysfunction	93 (75.0)
	Urinary frequency	57
	Nocturia	47
	Sense of residual urine	32
	Weak stream	22
	Urinary incontinence	6
	Sexual dysfunction	61 (49.2)
	Reduced libido	44
	Erectile dysfunction	33
Have you been treated for these symptoms?	Ejaculatory dysfunction	20
	No	87 (70.2)
	Home remedy or self-treatment	7 (5.6)
	Treatment in hospital	30 (24.2)
Do you intend to treat these symptoms?	No	57 (46.0)
	Yes	67 (54.0)

DM: diabetes mellitus.

DM and treatment experience showed a positive correlation as well ( $r=0.76$ ;  $p<0.001$ ).

## DISCUSSION

DM remains a serious health problem worldwide. According to domestic research,<sup>2,3</sup> this disease is relatively common, with a prevalence rate of 7.1~15.2% in adults aged older than 40 years. Owing to its high prevalence, knowledge of DM is increasing, especially in DM patients. Common complications of DM include macrovascular diseases (e.g., coronary artery disease, peripheral arterial disease, and cerebrovascular disease) and microvascular diseases (e.g., retinopathy, nephropathy, and neuropathy). A wide range of educational material on DM is available to patients, and therefore, the common complications that may occur are relatively well known.

Clinicians often routinely test for common complications. However, knowledge of urogenital complications associated with DM, such as sexual dysfunction and voiding dysfunction, is relatively limited, and these complications may not be tested for owing to symptoms not being reported. Therefore, a patient with complications may not

receive the appropriate treatment.

Erectile dysfunction and ejaculation disorders are relatively common in patients suffering from DM and are one of the initial signs of diabetic neuropathy. The prevalence of erectile dysfunction shows a positive correlation with the age of the patient and treatment duration, and erectile dysfunction may occur without any other symptoms of diabetic autonomic neuropathy.

Because the pathophysiology of diabetic erectile dysfunction can vary, it may occur during any stage of an erection. Typical mechanisms underlying dysfunction include increased levels of intracellular reactive oxygen species, macrovascular or microvascular insufficiency, endothelial dysfunction, reduced levels of nitric oxide,<sup>4-6</sup> and autonomic neuropathy.<sup>7</sup> The prevalence rate of erectile dysfunction in diabetic male patients has been reported to be 28~75%, which is very high, although some discrepancy may exist between studies owing to the use of different diagnostic criteria.<sup>8-11</sup> The prevalence shows a positive correlation with age (an older patient is more likely to experience erectile complications), and dysfunction occurs 10~15 years earlier in the diabetic population than in healthy males.<sup>10</sup> Lee et al<sup>12</sup> reported that 72% of diabetic

nephropathy patients experience erectile dysfunction, whereas Oh et al<sup>13</sup> conducted local community-based research on men aged 50 years and older with metabolic syndrome and found that 69% had moderate or severe dysfunction.

In addition to erectile dysfunction, decreased libido is a major sexual complication associated with diabetes. Type 2 DM or metabolic syndrome has been shown to be accompanied by late-onset hypogonadism.<sup>14</sup> In addition, the serum level of testosterone, which is known to be associated with libido, is significantly lower in diabetic patients than in healthy men.<sup>15,16</sup>

In this study, 61 patients (22.2%) reported sexual dysfunction. Because this study was a survey of diabetic patients, the actual prevalence rate may be different from that reported in this study. In men with diabetes, the relative risk for erectile dysfunction increased with poor glycemic control, the duration of diabetes, and the number of nonurologic DM-associated complications.<sup>9</sup> In this study, the recognition and treatment of complications showed a positive correlation with the duration of diabetes.

Voiding dysfunction is another major urogenital complication associated with diabetes. High blood glucose levels may cause axonal damage throughout the nervous system, which leads to demyelination.<sup>17</sup> The early symptoms of voiding dysfunction include an inability to recognize that the bladder is full and incomplete emptying of the bladder, which causes the components of the bladder wall to be altered and may lead to immune dysfunction.<sup>17</sup> Because the contractility of the bladder is impaired, the capacity and post-void residual volume of the bladder increases, which results in hesitancy, decreased voiding frequency, incontinence, and urinary tract infection.<sup>18,19</sup>

Clinical studies have reported that patients with diabetes frequently suffer from detrusor overactivity; the prevalence of this disorder ranges from 39% to 61%.<sup>20,21</sup> Decreased detrusor contractility or sensation are less common,<sup>20</sup> and an acontractile bladder appears to be quite rare. Bladder outlet obstruction may occur in diabetic male patients. Diabetes and metabolic syndrome may cause benign prostate enlargement, resulting in voiding dysfunction.<sup>22</sup>

Of all the patients who participated in this study, 45.1% reported urogenital symptoms. Among these, 93 patients

(75%) reported voiding dysfunction and 61 (49%) reported sexual dysfunction. However, only 37.1% of the patients were aware that these symptoms were associated with DM.

Although urologic complications are common and are major health problems in both male and female diabetes patients, their early diagnosis and treatment is difficult because of the low level of perception regarding these disorders among patients, which was demonstrated in our survey.

Several studies about urogenital complications in diabetic patients revealed varying results<sup>8-11,13,20,21</sup> due to differing inclusion criteria, diagnostic modality, or selection bias of severity. Some studies regarded the International Prostate Symptom Score (IPSS) or International Index of Erectile Function (IIEF) as important, but an imaging study or physical examination by a urologist would have been mandatory to make an accurate diagnosis. An important limitation of the present study was the lack of a control group, since we limited its scope to diabetic patients. A causal relationship between DM and urogenital symptoms was also unclear. However, our study is important because we were able to identify the subjective perception level of urogenital complications in diabetic patients.

In addition, many patients associated these complications with aging, not disease, and had no comprehensive understanding of their symptoms. Hence, the appropriate physicians were not consulted. Urogenital complications are often related to lifestyle and are often irreversible and chronic. In addition, they may occur during the early stages of diabetes, regardless of the severity of DM or the use of insulin. Thus, if DM is diagnosed in a patient, the clinician must thoroughly test for and manage all possible urogenital complications.

## CONCLUSIONS

This survey showed that the prevalence rate of urogenital symptoms in diabetic patients was 45.1%, and the proportion of these patients who were aware that these symptoms were associated with DM complications was low (37.1%). Therefore, it is necessary to adequately inform and educate DM patients regarding the possibility of urogenital complications.

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