

Prevalence of urinary incontinence in diabetes mellitus type 2 and its impact on quality of life.

A Cross-sectional study

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Abstract : BACKGROUND- Type 2 diabetes mellitus is increasingly common because of increases in the prevalence of a sedentary lifestyle. Urinary incontinence is defined by the International Incontinence Society as the involuntary loss of urine that represents a hygienic or social problem to the individual [5]. Evidence suggests that urinary incontinence can be caused by microvascular damage due to Diabetes mellitus leading to alterations in detrusor muscle function, innervation, and function of the neuronal component [7]. Two microvascular complications caused by diabetes are microalbuminuria, and peripheral neuropathic pain, were significantly associated with incontinence [4].

AIM- To study the prevalence of urinary incontinence in young old population with type 2 diabetes mellitus and its impact of quality of life.

OBJECTIVE- 1. To check whether any sign and symptoms of urinary incontinence in patients who are diagnosed with type 2 diabetes mellitus using revised urinary incontinence scale. **2.** To assess the impact on quality of life in patients with urinary incontinence using incontinence quality of life questionnaire.

OUTCOME MEASURES- Revised urinary incontinence scale [RUIS] for diagnosis of urinary incontinence and Incontinence quality of life questionnaire to see the impact of urinary incontinence on the quality of life.

METHODOLOGY- Ethical approval had been obtained. Subject chosen ranged in age from 40-70 years on the basis of inclusion and exclusion criteria. A RUIS and Incontinence quality of life questionnaire was distributed among the 150 subjects. Written and signed consent was taken from the participants. The questionnaire was explained to the participants. The score was given according to the question answered which were calculate the prevalence. A Statistical analysis was performed and the result were tabulated.

RESULT-150 subjects having diabetes mellitus between age group 40 to 70 were included in cross-sectional study. Out of 150 subjects having type 2 diabetes mellitus screened for prevalence of urinary incontinence, 58.7% population having urinary incontinence as per Revised urinary incontinence scale. Amongst the affected people 75 subjects are male and 67 subjects are female. Out of 150 subjects, 62.4% population has effect on their quality of life.

CONCLUSION - This study concludes that there is a 58.7% prevalence of urinary incontinence in type 2 diabetes mellitus and 62.4% population shows affected quality of life due to urinary incontinence.

KEY WORDS - Urinary Incontinence, Diabetes Mellitus, RUIS

Introduction

India is one of the epicenters of the global diabetes mellitus pandemic [1]. Rapid socioeconomic development and demographic changes, have led to the explosive increase in the prevalence of diabetes mellitus in India over the past four decades [2]. Type 2 diabetes mellitus is increasingly common, primarily because of increases in the prevalence of a sedentary lifestyle and obesity [2]. It is one of the most common metabolic disorders that is caused by a combination of two factors: defective insulin secretion by pancreatic β -cells and the inability of insulin-sensitive tissues to respond appropriately to insulin [3]. Defects in any of the mechanisms can lead to a metabolic imbalance responsible for the development of the disease [3]. Diabetes appears to be related to increased risk of incontinence both with or without obesity [4].

Urinary incontinence is defined by the International Incontinence Society as the involuntary loss of urine that represents a hygienic or social problem to the individual [5]. It is the point of issue that will create physiological, psychological stress to both genders.[5] Storage symptoms such as urgency, frequency, and nocturia, with or without urge incontinence, are characterized as overactive bladder (OAB). OAB can lead to urge incontinence [6]. Disturbances in nerves, smooth muscle, and urothelium can cause this condition [6].

Evidence suggests that urinary incontinence can be caused by microvascular damage due to Diabetes mellitus leading to alterations in detrusor muscle function, innervation, and function of the neuronal component [7]. Two microvascular complications caused by diabetes are microalbuminuria, and peripheral neuropathic pain, were significantly associated with incontinence [4]. These suggest that incontinence may be a more common consequence of hyperglycemia than other microvascular complications such as retinopathy, neuropathy, or nephropathy [4]. Aging is associated with declining function in nearly every physiologic system [8]. The aging bladder specifically may be described as manifesting detrusor overactivity, impaired contractility, or a combination of both [8].

Urinary incontinence also occurs as a result of any changes or problem with transfer of signals from the brain to the bladder or due to problem with the detrusors response, sphincters or as a result of combination of all the problems [9]. Potential risk factors for UI include increasing age, parity, obesity, surgery, vaginal deliveries, constipation, and chronic respiratory problems. The inability to

control urine is quite a distressing problem [9]. Although it does not lead to death, it causes substantial morbidity, social seclusion, and psychological stress resulting in impaired QoL [9].

Revised urinary incontinence scale [RUIS] is used for diagnosis of urinary incontinence [10]. The RUIS total score is calculated by adding up a person's score for each question [10]. Adding the score for each of five questions will result in possible score range 0-16 [10]. Incontinence quality of life questionnaire is used to see the impact of urinary incontinence on the quality of life [11]. The I-QOL has 22 questions with the following 3 subscales: avoid and limiting behaviors (items), psychosocial impacts (9 items), and social embarrassment (5 items) [11].

AIM –

To study the prevalence of urinary incontinence in young old population with type 2 diabetes mellitus and its impact of quality of life.

OBJECTIVES –

Check whether any sign and symptoms of urinary incontinence in elderly who are diagnosed with type 2 diabetes mellitus using revised urinary incontinence scale.

To assess the impact on quality of life in elderly with urinary incontinence using incontinence quality of life questionnaire.

METHODOLOGY AND MATERIALS –

- Type of study- Cross-sectional Study.
- Sample method- Purposive sampling.
- Sample size- 150.
- Study area- Pune.
- Study duration- 6 months

INCLUSION AND EXCLUSION CRITERIA

Inclusion Criteria	Exclusion criteria
Controlled Type 2 diabetes mellitus.	Motor neuron disease
Age group[40-70 years]	Abdominal surgery
Both male and female	hernia

OUTCOME MEASURE

1. Revised urinary incontinence scale.
2. Incontinence quality of life questionnaire.

PROCEDURE -

The ethical committee provided its approval. Individuals were approached, and those who met the inclusion criteria were chosen. The participants' consent was obtained. Following the completion of the consent forms, the demographic data of the participants, including age, gender, diagnosed diabetes mellitus since how many years were collected. Patients were asked to complete a questionnaire based on their symptoms. Data is gathered and analyzed using the most appropriate statistical tests.

STATISTICAL ANALYSIS

Table 1 – No. of Individual Participated in the study

Gender	No. of Subjects
Male	77(51.3%)
Female	73(48.7%)

Interpretation – Table shows total of 150 participants out of which 48.7% are female and 51.3% are male.

The column chart shows the count of participants i.e., 73 females and 77 males.

TABLE-2 Represents Age group.

AGE GROUP	No. of subjects	Percentage
40-50 YEARS	40	26.7%
51-60 YEARS	51	34%
61-70 YEARS	59	39.3%

Interpretation- Table 2 shows out of 150 subjects, 26.7% belongs to age group 40-50 years,34% belongs to 51-60 years,39.3% belongs to 61-70 years.

Revised

Urinary

Incontinence

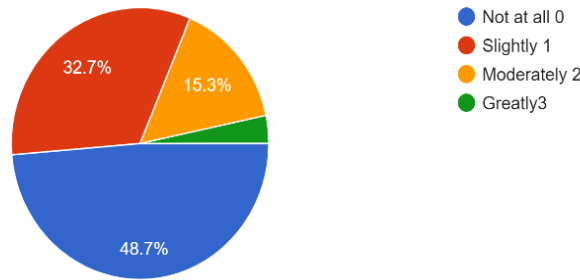
Scale

1. Urine leakage related to the feeling of urgency.

TABLE-3

GRADE	NO. OF SUBJECT	Percentage
NOT AT ALL	73	48.7%
SLIGHTLY	49	32.9%
MODERATELY	23	15.3%
GREATLY	5	3.3%

FIGURE-1



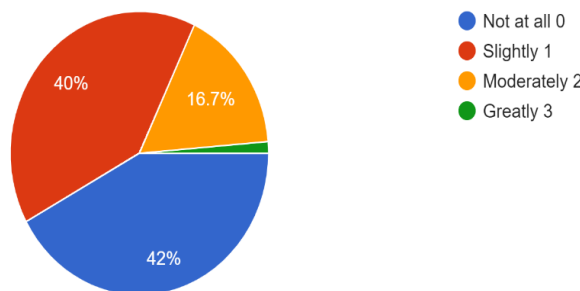
Interpretation – out of 150 subjects,48.7% are not having any urinary leakage ,32.9% are having slight urine leakage ,15.3% are having moderate urine leakage,3.3% are having great urine leakage related to a feeling of urgency.

2.Urine leakage related to physical activity, coughing, or sneezing.

TABLE-4

GRADES	NO. OF SUBJECT	PERCENTAGE
Not at all	63	42%
Slightly	60	40%
Moderately	25	16.7%
Greatly	2	1.3%

FIGURE-2



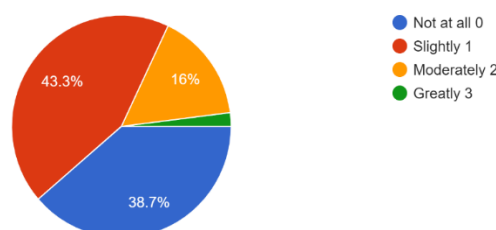
Interpretation- out of 150 subjects,42% have no urine leakage, 40% are having slight urine leakage , 16.7% are having moderate urine leakage, 1.3% are experiencing great urine leakage related to physical activity, coughing, or sneezing.

3.Small amount of urine leakage(drops).

TABLE-5

GRADE	NO. OF SUBJECT	percentage
NOT AT ALL	58	38.7%
SLIGHTLY	65	43.3%
MODERATELY	24	16%
GREATLY	3	2%

FIGURE-3



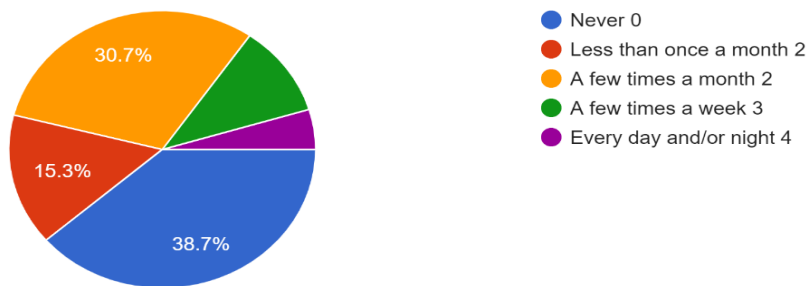
Interpretation-out of 150 subjects,38.7% are having no amount of urine leakage, 43.3% are having a slight amount of urine leakage, 16% are having a moderate amount of urine leakage, 2% are having a great amount of urine leakage(drops).

4.How often do you experience urine leakage?

TABLE-6

GRADES	NO. OF SUBJECT	percentage
NEVER	58	38.7%
LESS THAN ONCE A MONTH	23	15.3%
A FEW TIMES A MONTH	46	30.7%
A FEW TIMES A WEEK	16	10.5%
EVERY DAY AND/OR NIGHT 4	7	4.6%

FIGURE-4



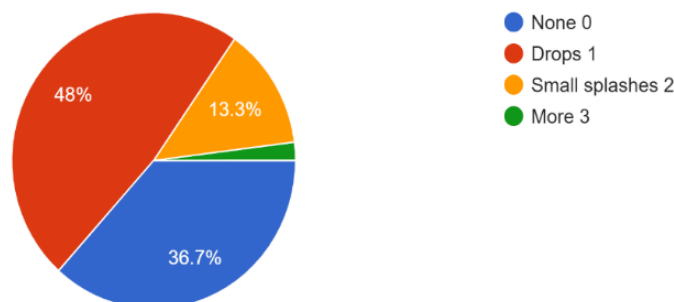
Interpretation- out of 150 subjects, 38.7% never experienced urine leakage,15.3% experience urine leakage less than once a month, 30.7% experience urine leakage a few times a month, 10.5% experience urine leakage a few times a week , 4.6% experience urine leakage every day and/or night.

5.How much urine do you lose each time?

TABLE-7

Grade	No. of subjects	Percentage
NONE	55	36.7%
DROPS	72	48%
SMALL SPLASHES	20	13.3%
MORE	3	2%

FIGURE-5



Interpretation-out of 150 subjects,36.7% have experienced no loss of urine, 48% experienced urine loss in the form of drops, 13.3% experienced urine loss in the form of small splashes, 2% experienced a great amount of urine loss.

Incontinence Quality of life questionnaire interpretation -

FIGURE-6

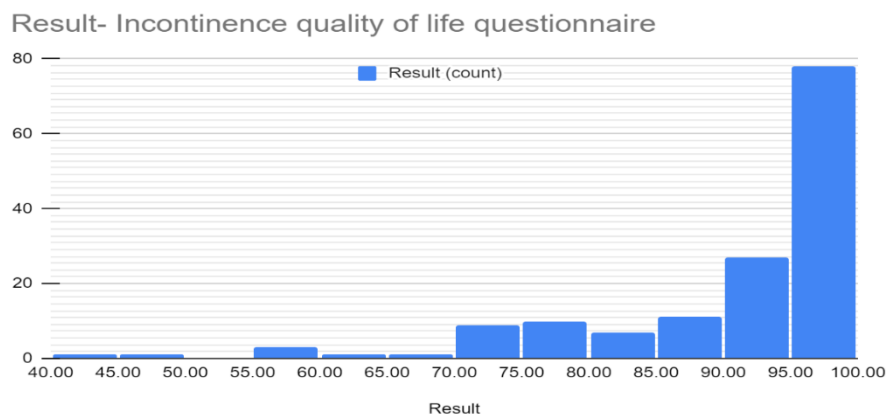
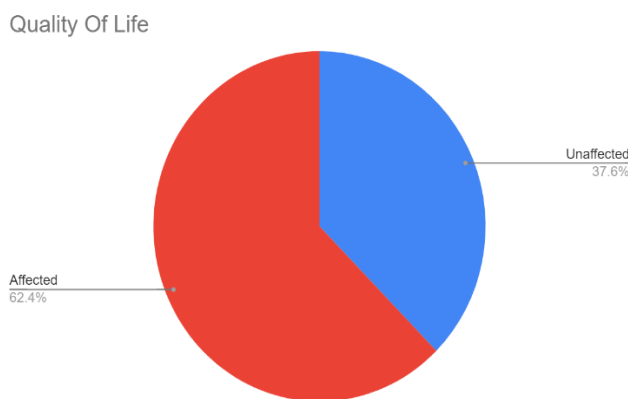


FIGURE-7



Interpretation-Figure 7 shows out of 150 responses, 93 subjects have impact on their quality of life, 57 have no impact on their quality of life.

RESULT –

- Table 1 shows total of 150 participants out of which 48.7% are female and 51.3% are male. The column chart shows the count of participants i.e., 73 females and 77 males.
- Table 2 shows out of 150 subjects, 26.7% belongs to age group 40-50 years, 34% belongs to 51-60 years, 39.3% belongs to 61-70 years.
- Figure 1 shows that 48.7% have no urine leakage, 32.7% have slight urine leakage, and 15.3% have moderate urine leakage related to the feeling of urgency.
- Figure 2 shows that 42% have no urine leakage, 40% have slight urine leakage, 16.7% have moderate urine leakage, and 1.3% have great urine leakage related to physical activity, coughing, or sneezing
- Figure 3 shows that 38.7% have no small amount of urine leakage, 43.3% have a slight amount of urine leakage (drops), 16% are having a moderate amount of urine leakage (drops) and 2% are having a great amount of urine leakage (drops)
- Figure 4 shows that 38.7% never experienced urine leakage. 15.3% Experiencing urine leakage less than once a month. 30.7% Experiencing urine leakage a few times a month. 10.7% Experiencing urine leakage a few times a week. 4.6% experience urine leakage every day and/or night.
- Figure 5 shows that 36.7% experiencing no loss of urine. 48% experiencing urine loss in the form of drops. 13.3% experiencing urine loss in the form of small splashes. 2% experiencing a great amount of urine loss
- Figure 7 shows 62.4% population has effect on their quality of life. 37.6% have no effect on their quality of life.

DISCUSSION-

Type 2 diabetes mellitus (DM) is a chronic metabolic disorder in which prevalence has been increasing steadily all over the world [12]. Type 2 DM is characterized by insulin insensitivity as a result of insulin resistance, declining insulin production, and eventual pancreatic beta-cell failure [12]. Urinary incontinence is a common problem among older women and men, has a significant negative impact on quality of life [13]. Incontinence can result from a failure of storage, i.e., detrusor instability or a failure of the sphincter mechanism leading to urinary incontinence. In addition, there is a complex neural control that coordinates urethral and bladder function to alter from storage to voiding at socially acceptable times. [14]. Diabetes mellitus is an independent risk factor for urinary incontinence [15]. Evidence suggests that urge incontinence can be caused by microvascular damage due to DM leading to alterations in detrusor muscle function, innervation, and function of the neuronal component, whereas stress UI is due to dysfunction of the striated muscle of the urethral sphincter and pelvic floor muscles and their innervation [15]. DM plays particularly a role in Urge UI due to glycosuria, detrusor overactivity, recurrent urinary tract infections, and diabetic cystopathy. [15]

Based on the questionnaire, 37.3% population has mild urinary incontinence, 18.7% population has moderate urinary incontinence, and 2.7% have severe urinary incontinence. Diabetic medication can lead to urinary incontinence symptoms. The medication regulates high blood sugar levels, forces glucose from the blood out into the urine and the bladder can become irritated, leading to incontinence. The excessive thirst caused by diabetes can lead to incontinence issues, as well. It can also contribute to nocturia which irritates the bladder. In the present study, 96.7% population are on regular medication. High blood sugar levels can contribute to frequent urinary tract infections (UTI) which can contribute to an overactive bladder and urinary frequency. [16]

Worsening glycemic control may cause progressive microvascular injury leading to gradually worsening connective tissue support, or cause worsening dysfunction at the pudendal nerve endings leading to gradually compromised voluntary urethral sphincter function [17]. Worsening glycemic control also leads to greater glycosuria with a higher volume load, and may lead to decreased bladder contractility, baseline maximum flow rates, and voided volume, leading to urinary incontinence [17]. The purpose of my study was to find out the prevalence of urinary incontinence in type 2 diabetes mellitus using a revised urinary incontinence scale and its impact on their quality of life using the incontinence quality of life questionnaire. There is a 58.7% prevalence of urinary incontinence in type 2 diabetes mellitus and 62.4% population shows affected quality of life due to urinary incontinence.

Many studies suggested that age along with diabetes mellitus plays a significant role in urinary incontinence, several studies agree that the risk of urinary incontinence increase after the age of 60. Similarly, in the present study, 36.7% population is above 60 years. In the study done by Mark Goepel, Ruth Kirschner-Hermanns, Urinary Incontinence in the Elderly in 2010 showed that urodynamic investigations in elderly people with type 2 diabetes have shown pathological findings in 79% of men and 59% of women (reduced sensory reflexes, detrusor hypercontractility, residual urine, increased bladder capacity) [18]. In addition to the central and peripheral polyneuropathic changes, different diabetes-related functional impairments take effect in the development of urinary incontinence [18].

CONCLUSION-

This study concludes that there is a 58.7% prevalence of urinary incontinence in type 2 diabetes mellitus and 62.4% population shows affected quality of life due to urinary incontinence.

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