

# Vulvodynia prevalence and associated psychosexual problems in middle-aged diabetics at a tertiary care hospital in Pakistan

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## Abstract

**Background & Objective:** Vulvodynia is a significant clinical disorder in women but it remains a neglected health problem in many societies. The present study was aimed to identify the frequency of vulvodynia in the diabetic and non-diabetic population and its association with common psychosexual problems in the population of Khyber Pakhtunkhwa, Pakistan. **Methods:** This study is cross sectional descriptive investigation and conducted in tertiary care hospital (Lady Reading Hospital, Peshawar) in 2018-2019. A total of 75 cases categorized into diabetic and non-diabetic groups were collected under the supervision of qualified gynecologists. Groups were compared on the basis of demographics, symptom frequency, psychological and clinical data, using a pre-designed proforma. **Results:** The incidence of vulvodynia in women with type 1 and type 2 diabetes ( $n = 50$ ) and in the non-diabetic population ( $n = 25$ ) was 66.6% and 33.3%, respectively. The vulvodynia severity score based on Friedrich's criteria in diabetes was 80% and in non-diabetes it was 40%. The cotton bud swab test severity index was 80% in diabetes and 40% in non-diabetes. The erythema rating scale score in diabetes was 81% and in non-diabetes it was 39%. Finally, psychological and psychosexual problem frequency in diabetes was 100% and in non-diabetes was 88%.

**Conclusions:** Women with diabetes had a fourfold risk of vulvodynia up to middle age as compared to non-diabetics in Peshawar, Pakistan. Diabetics with vulvodynia possessed a nine-fold risk of experiencing psychological symptoms of depression (OR = 9.33; 95% CI 1.0-88.6) and an even higher risk of somatic depression symptoms.

**Keywords:** Vulvodynia, diabetes mellitus, frequency, psychosexual disorders.

## INTRODUCTION

Vulvodynia is a significant clinical disorder in women but it remains a neglected health problem in many societies.<sup>1</sup> According to the National Institutes of Health US (2002-2006), vulvodynia may be defined as a “chronic, persistent, poorly identified painful condition of the entire or a portion of the vulva”.<sup>2</sup> It is characterized by a sensation of burning, stinging, irritation, or rawness, for which optimal pharmacological intervention still remains unclear.<sup>3</sup> In the case of provoked vulvodynia, common triggers/factors include intromission (resulting in introital dyspareunia) or tampon insertion.<sup>4</sup>

Vulvar pain and diabetic neuropathy share similar clinical characteristics. Both illnesses are chronic and have a slight concordance between symptomatology and signs, patient age being no bar for this condition. The adjectives used to describe the pain in vulvar and diabetic neuropathic syndromes coincide and include such terms as burning, lancinating and knife-like. In both conditions, symptoms may be generalized or localized. Both clinical syndromes have a psychosomatic component, and may be linked with sexual dysfunction.<sup>5</sup> The etiology of vulvodynia is still unknown and for individual female patients, there may be many contributing

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factors. It is estimated that the prevalence of vulvodynia is 3-7% of the female population.<sup>6</sup>

Vulvodynia remains a hidden health problem and approximately 40% of patients do not seek medical care.<sup>7</sup> Sixty percent of vulvodynia sufferers have reported an adversely affected quality of life, many also describing a moderate to severe disturbance of sex life and dissuasion from sexual relations.<sup>2</sup> The chronicity of pain and presence of physical disease affects sexuality and self-image leading towards depression and anxiety.<sup>8</sup> Although complex pathophysiological mechanisms are implicated in the mediation of vulvodynia, in general, the overall result appears to stem from neuropathically mediated pain. The existing management approach to vulvodynia resembles neuropathic pain management, involving adjunct therapy where monotherapy often fails. Moreover, adverse effects invariably limit clinical therapeutic utility and sometimes discontinuation of therapy is the outcome, hence there is an overt need to evaluate the management of vulvodynia.<sup>9</sup>

Currently, no preclinical or clinical data regarding the prevalence and effective clinical management of vulvodynia are available in Pakistan. Hence, there is a distinct need to assess the prevalence and management of the condition in the local population. The present study was designed therefore to identify the frequency of vulvodynia in the diabetic and non-diabetic population and its association with common psychosexual problems.

## METHODS

### *Subjects*

The two groups of females were composed of patients suffering from type 1 and type 2 diabetes mellitus (> 3 years duration) and non-diabetic females between the ages of 35-60 years presenting with vulvodynia. The exclusion criteria comprised pregnant patients and those individuals who had completely recovered from vulvodynia.

### *Study design*

The study was designed as a cross sectional descriptive investigation and was conducted in the Department of Gynecology and Obstetrics, Lady Reading Hospital, Peshawar. Informed consent was obtained from respective participants on attendance at the start of the study. Due to any possibility of a literacy constraint, patient information was provided verbally and consent was articulated orally.

### *Diagnosis of diabetes mellitus*

Participants were independently evaluated for diabetes mellitus (HbA1c and plasma glucose) and the subjects were divided into two study groups; diabetic and non-diabetic females. During diagnosis of diabetes mellitus, Friedrich's criteria for diagnosis of vulvodynia was applied as mentioned below.

### *Friedrich's criteria for diagnosis of vulvodynia (Friedrich, 1987)<sup>2,11,12</sup>*

The following criteria were applied: (1) Severe pain upon vestibular touch or attempted vaginal entry (dyspareunia); (2) tenderness to pressure localized within the vulvar vestibule during the cotton swab test, and (3) vulvar erythema (inflammation). Physical outcomes were confined to vestibular erythema of varying degrees.<sup>2,7</sup>

Scoring scale criteria were employed for the diagnosis of vulvodynia and the measures encompassed four variables: dyspareunia, burning, itching, swab test and erythema. The following scoring scale was adopted to evaluate these parameters: 0 = absence of all four variables; 1 = mild variables; 2 = moderate variables; 3 = severe variables.<sup>13</sup>

### *The cotton swab test/Q-tip test*

A swab test was used to localize the painful areas (vulvodynia) and to categorize the severity. The test was performed with a cotton swab lightly palpated at each of six sites within the vulvar vestibule (i.e., clitoris, perineum, right and left labia minora, and right and left labia majora) and rated on a four-point scale: absent (0), mild (1), moderate (2), and severe (3).

### *The erythema rating scale*

Visual assessment of vulval erythema was conducted using the following four-point rating scale (14): absent (0), mild (1), moderate (2), and severe (3).<sup>13</sup>

### *Ethical approval*

The study was approved by the Institutional Research and Ethics Board (IREB) of Lady Reading Hospital, Peshawar, Pakistan vide reference letters 41/IREB/PGMI/LRH. Informed consent was obtained from respective participants on attendance at the start of the study. The study was also approved by the Ethical Committee of the Department of Pharmacy, University of Peshawar, Pakistan; vide reference Number09/EC-19/Pharm.

### Data analysis

Data was analyzed by mean  $\pm$  standard deviation for descriptive statistics and for comparison of variables; the chi square test ( $\chi^2$ ) was applied. In the case of co-morbid conditions for vulvodynia, risk ratios were calculated.

### RESULTS

Approximately 35,000 female patients presented at the outpatient Department of Gynecology and Obstetrics, Lady Reading Hospital Peshawar, Pakistan in the year 2018-2019. Out of the overall total of presenting patients, 13,000 (37%) reported vulvar pain symptoms, of whom 6000 (46%) declined to participate in the study, 2,000

(15.3%) patients had symptoms of vulvodynia which subsided soon after pregnancy, 1,000 (7.7%) were past cases (i.e. completely recovered from vulvodynia) and out of the remaining 6,000 (46.1%) patients, after imposition of exclusion criteria there were 75 patients with vulvodynia remaining (Figure 1).

Thus, study cases ( $n = 75$ ) which fulfilled the inclusion criteria, consisted of patients suffering from diabetes experiencing vulvodynia ( $n = 50$ : Type 1 = 15, Type 2 = 35) and non-diabetic patients with vulvodynia ( $n = 25$ ) indicating a higher proportion of diabetic females suffering vulvodynia within the whole study sample ( $P < 0.001$ ) as shown in Table 1.

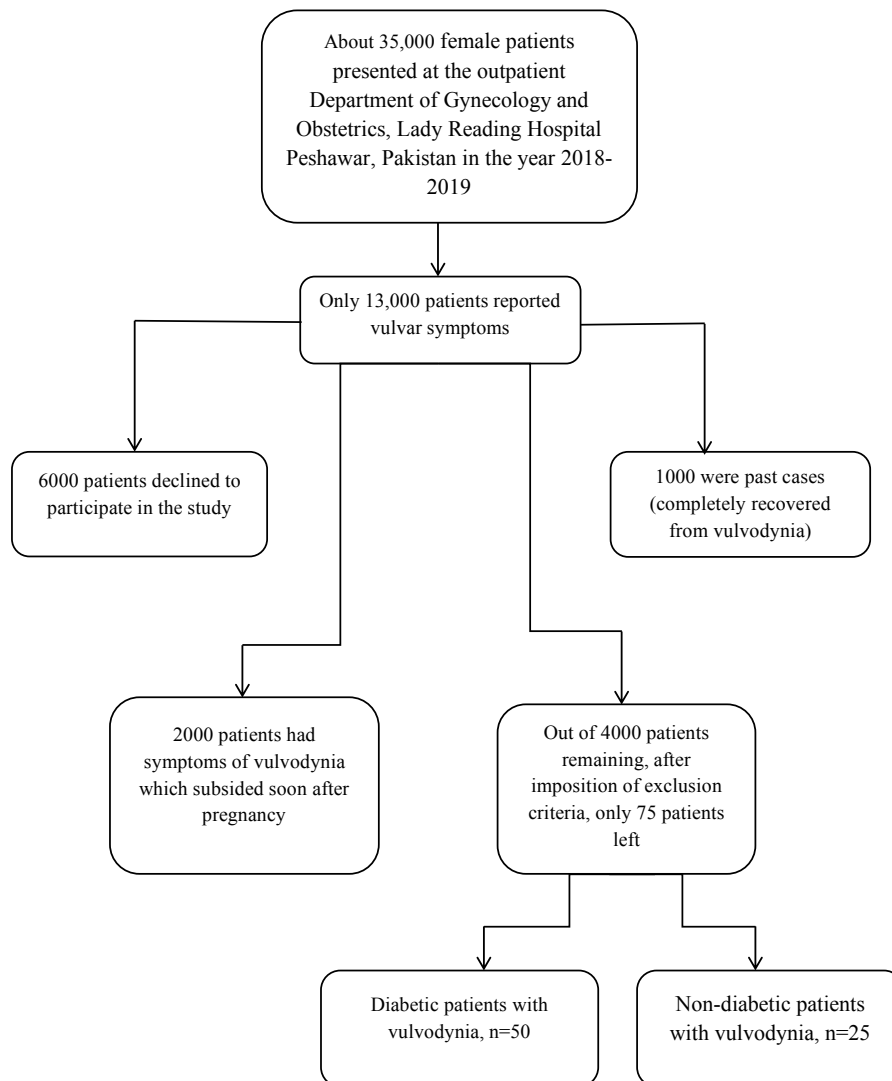


Figure 1. Patient enrollment chart at the outpatient Department of Gynecology and Obstetrics, Lady Reading Hospital Peshawar, Pakistan in the year 2018-2019.

Table 1: Demographic characteristics

	Diabetic patients with vulvodynia n=50	Non-diabetic patients with vulvodynia n=25	X <sup>2</sup> value	p-value
<b>Age (y, SD)</b>	48.2(±5.9)	45.8(±4)		
<b>Employment status</b>			0.08	0.78
Employed	5(10)	2(8.0)		
Unemployed	45(90)	23(92.0)		
<b>Marital status</b>			1.19	0.75
Married	41(82)	23(92.0)		
Divorced	1(2)	0		
Unmarried	3(6)	1(4.0)		
Widowed	5(10)	1(4.0)		
<b>Education</b>			18.58	<0.001**
Educated	12(24)	19(76.0)		
Uneducated	38(76)	6(24.0)		
<b>Health condition</b>			0.93	0.63
Poor	5(10)	4(16.0)		
Average	31(62)	16(64.0)		
Good	14(28)	5(20.0)		
<b>Residency</b>			0.12	0.74
Urban	20(40)	9(36.0)		
Rural	30(60)	16(64.0)		
<b>Nationality</b>			0.43	0.52
Pakistani	46(92)	25(100.0)		
Other	4(7)	0(0.00)		
<b>History of pregnancy</b>			0.59	0.74
Fertile and sexually active	43(86)	23(92.0)		
Primary infertility	4(8)	1(4.0)		
unmarried	3(6)	1(4.0)		
<b>Premenopausal</b>	49(98)	24(96.0)	4.65	0.03
Postmenopausal	1(2)	1(4.0)		
<b>Taking care of pelvic hygiene</b>	38(76)	6(24.0)	18.58	<0.001**
<b>History of dysmenorrhea</b>	40(80)	24(96.0)	3.40	0.065
<b>Irregular periods</b>	44(88)	11(44.0)	16.50	<0.001**
<b>Birth control</b>			1.83	0.40
Hormonal	5(10)	3(12.0)		
Condoms	26(52)	17(68.0)		
IUD/vasectomy/hysterectomy	6(12)	0(0.0)		
Postmenopausal	1(2)	1(4.0)		
None or not active	12(24)	4(16.0)		

Footnotes: IUD = Intrauterine devices, \*\*: Level of significance, n: number of patients (percent), y : age in years, X<sup>2</sup> : Chi Square test

#### Demographics characteristics of diabetic and non-diabetic middle-aged females

As depicted in Table I, the majority of females between two groups reported that the origin of vulvodynia was spontaneous with a mean age of

48.2 years for diabetic and 45.8 years for non-diabetic females. Employment record (10% vs. 8%,  $P = 0.77$ ), marital status (married 82% vs. 92%, divorced 2% vs. 0%, unmarried 6% vs. 4%, widowed 10% vs. 4%,  $P = 0.77$ ), education

**Table 2. Vulvodynia descriptors**

	<b>Diabetic patients with vulvodynia n=50</b>	<b>Non-diabetic patients with vulvodynia n=25</b>	<b>X<sup>2</sup> value</b>	<b>P-value</b>
<b>Cotton swab test(positive)</b>			13.16	0.001**
• Clitoris	4(8.0)	3(12.0)		
• Clitoris + right labia minora + left labia minora	6(12.0)	12(48.0)		
• Clitoris + right labia minora + left labia minora + right labia majora + left labia majora + perineum	40(80.0)	10(40.0)		
<b>Friedrich's criteria</b>	12.5/10	19.5/21.5	18.86	0.000**
<b>Score 0</b>	0	0(0.0)		
<b>Score1</b>	5(10.0)	4(16.0)		
<b>Score 2</b>	5(10.0)	11(44.0)		
<b>Score 3</b>	40(80.0)	10(40.0)		
<b>Pain type</b>			3.02	0.22
• Provoked	18(36.0)	6(24.0)		
• Unprovoked	26(52.0)	19(76.0)		
• Mixed (provoked +unprovoked)	6(12.0)	1(4.0)		
<b>Pain descriptors</b>			0.27	0.966
• Aching	5(10.0)	3(12.0)		
• Stinging	5(10.0)	3(12.0)		
• Burning	30(60.0)	15(60.0)		
• stabbing	10(20.0)	4(16.0)		
<b>Condition during periods</b>			27.13	<0.001**
• Worsen during periods	40(80.0)	10(40.0)		
• Condition resolves during periods	2(4.0)	14(56.0)		
• No affect(remains same)	8(16.0)	1(4.0)		
<b>Conditions/factors that resolves symptoms</b>			6.90	0.032*
• Self-resolving	28(56.0)	21(84.0)		
• By using medication	4(8.0)	2(8.0)		
• By having home treatment	18(36.0)	2(8.0)		
<b>Conditions/factors that worsen symptoms</b>			3.02	0.52
• Urination	1(2.0)	1(4.0)		
• Intercourse	12(24.0)	2(8.0)		
• Urination+ Intercourse	2(4.0)	1(4.0)		
• Urination + intercourse + walking + diet	5(10.0)	4(12.0)		
• Urination + Intercourse + undergarments + bowel movements	30(60.0)	17(68.0)		
<b>Medication used before</b>	15(30)	1(4.0)	6.71	0.01*
<b>Dyspareunia</b>	48(96)	24(96.0)	0.00	1.00
<b>Impact on intercourse</b>			9.15	0.01*
• Ever stopped intercourse due to pain	30(60)	17(68.0)		
• Fear of intercourse	20(40)	5(20.0)		
• comfortable	0	3(12.0)		
<b>Disturbed sexual life</b>	42(84)	22(88.0)	0.21	0.64
<b>Chronic fatigue</b>	50(100)	13(52.0)	24.61	<0.001**

Footnotes: \*\*: Level of significance, n: number of patients (percent), X<sup>2</sup>: Chi Square test

**Table 3: Psychological symptoms of depression associated with vulvodynia**

	Diabetic patients with vulvodynia n=50	Non-diabetic patients with vulvodynia n=25	Risk ratio	95% confidence of interval	X <sup>2</sup> value	P-value
<b>Psychological symptoms of depression</b>			9.33	0.98-88.56	5.25	0.022*
• Continuous low mood, sadness/Lack of interest/enjoyment	42(44.0)	15(60.0)				
• Tiredness/intolerant	6(12.0)	7(28.0)				
• Recurrent thoughts about death	2(4.0)	0(0.0)				
• normal	0(0.0)	3(12.0)				
<b>Somatic symptoms of depression</b>			180	28.1-1154.34	55.65	<0.001**
• Sleep disturbances + Loss of appetite	2(4.0)	1(4.0)				
• Fatigue/loss of energy + Bodily aches/pains + Loss of libido	3(6.0)	23(92.0)				
• Sleep disturbances + Loss of appetite + Fatigue/loss of energy + Bodily aches/pains + Loss of libido	45(90.0)	1(4.0)				

Footnotes: \*\*: Level of significance, n: number of patients (percent), X<sup>2</sup>: Chi Square test

(24% vs. 76%,  $P < 0.001$ ), health condition (poor 10% vs. 16%, average 62% vs. 64%, good 28% vs. 20%,  $P = 0.62$ ), residency (urban 40% vs. 36%, rural 60% vs. 64%,  $P = 0.73$ ), nationality (Pakistani 92% vs. 100%,  $P = 0.51$ ).

*Vulvodynia descriptors of diabetic and non-diabetic middle-aged females*

The data concerning vulvodynia descriptors are shown in Table 2. In the cotton swab tests, women living with diabetes having vulvodynia reported the highest number of positive test areas as compared to non-diabetic females, the

**Table 4: Vulvodynia with comorbid conditions**

	Diabetic patients with vulvodynia n=50	Non-diabetic patients with vulvodynia n=25	Risk ratio	95% confidence of interval
<b>fibromyalgia</b>	12(24)	3(12)	2.3	0.59-9.11
<b>Interstitial cystitis</b>	7(14)	3(12)	1.1	0.28-5.07
<b>Inflammatory bowel syndrome</b>	9(18)	4(16)	1.3	0.31-4.18
<b>Hemorrhoids</b>	0	10(40)	0.03	0.004-0.25
<b>No comorbidity</b>	23(46.0)	5(20)	3.4	1.10-10.5

Footnotes: n: number of patients (percent).

difference being highly significant (80% vs. 40%,  $P < 0.001$ ). Women with diabetes reported a significantly higher score (3) of Friedrich's criteria for vulvodynia diagnosis than non-diabetic females (score1: 10% vs. 16%, score2: 10% vs. 44%, score 3: 80% vs. 40%,  $P < 0.001$ ), pain type (provoked 36% vs. 24%, unprovoked 52% vs. 72%, mixed 12% vs. 4%,  $P = 0.22$ ). Among the pain descriptors, burning (60%) was most reported type of pain in the women living with diabetes followed by stabbing (20%), stinging (10%) and aching (10%). In non-diabetic females the rank order of reported pain types were burning (60%), stabbing (16%), aching (12%) and stinging (12%) there being no significant difference between the patient groups ( $P = 0.9$ ).

#### *Psychological symptoms of depression of diabetic and non-diabetic middle-aged females*

Odds ratios demonstrated that females with diabetes had nine fold increased rate of psychological symptoms of depression (OR = 9.3; 95% CI 1.0-88.6) as shown in Table 3.

#### *Vulvodynia with comorbid conditions of diabetic and non-diabetic middle-aged females*

Results with comorbid conditions demonstrated that 46% of the patients with diabetes and vulvodynia presented with no co-morbidity as compared to 20% with vulvodynia but no diabetes as given in Table 4.

## **DISCUSSION**

Neurogenic pain or neuropathic pain according to the International Association for the Study of Pain (IASP) is defined as "pain arising as a direct consequence of a lesion or disease affecting the somatosensory system".<sup>14</sup> There are multiple factors contributing to neuropathic pain such as the peripheral nervous system (PNS) and CNS trauma, traumatic nerve lesion, metabolic disorders (diabetes), infections (herpes zoster and HIV), mechanical pressure (compression and entrapment), post-surgical nerve lesion and spinal cord trauma.<sup>15</sup>

According to the US National Institutes of Health (2002-2006), vulvodynia can be defined as a chronic, persistent, poorly identified, painful condition of the entire or a portion of the vulva. It is characterized by a sensation of burning, stinging, irritation, or rawness, for which optimal pharmacological intervention still remains unclear. It is estimated that the prevalence of vulvodynia

is 3-7% of the female population.<sup>2,6,16-18</sup> and without effective intervention, this prevalence is expected to rise. Epidemiological reports regarding vulvodynia designate it as a chronic state with a low remission rate of less than 25%. Most women do not discuss this disorder and even many investigators are also reluctant to converse about this condition. Thus, vulvodynia remains a hidden health problem and approximately 40% of patients do not seek medical care.<sup>7,19</sup> Sixty percent of vulvodynia sufferers have reported an adversely affected quality of life, many also describing a moderate to severe disturbance of sexual life causing them to stop or to avoid sexual relations.<sup>2</sup> Heightened pain can be felt with activities which exert pressure on the vulva including tampon and speculum insertion, intercourse, bicycling, horseback riding and even exercising, sitting, walking or ablutions.<sup>9,12</sup> Although complex pathophysiological mechanisms are most likely considered to be implicated in the mediation of vulvodynia, in general, the overall result appears to be a neuropathically mediated pain.

Calculation of the odds ratios indicated that within the study group up to their current life stage, patients living with diabetes had 4 times the risk of experiencing vulvodynia compared to non-diabetic patients (OR= 4; 95% CI 2.0-7.9). The data suggested that pre or post menopausality did not have any significant effect on either group (98% vs. 96%) whether they were diabetics or non-diabetics ( $P = 0.031$ ). In addition, the types of birth control method used (hormonal 10% vs. 12%, condoms 52% vs. 68%, IUD/vasectomy/hysterectomy 12% vs. 0%,  $P = 0.40$ ) did not significantly differ between either group (Table 1). In both study groups the percentage of reported incidence of dyspareunia was identical (96% vs. 96%,  $P = 1.0$ ), and the occurrence of a disturbed sex life was also comparable (84% vs. 88%,  $P = 0.64$ ). In the diabetic group, 60% compared to 20% of females in the non-diabetic group reported that they usually stopped intercourse midway due to pain, 40% vs. 68% reported a fear of intercourse and 4% vs. 12% reported no issue with intercourse, the inter group difference being highly significant ( $P = 0.001$ ). Moreover, diabetic females were more likely than non-diabetics to report chronic fatigue after intercourse (100% vs. 52%;  $P < 0.0001$ ) as given in Table 2.

Findings regarding exacerbation of vulvodynia revealed that diabetic women were more likely to report a worsening of vulvodynia during menstruation than non-diabetics (80% vs. 40%,  $P = 0.0001$ ). Factors that resolved vulvodynia

symptoms included medications (8% vs. 8%), home treatments (24% vs. 8%) and cases of self-resolution (68% vs. 84%) ( $P = 0.032$ ). Factors worsening vulvodynia symptoms comprised urination, intercourse, walking, diet, contact with undergarments and bowel movements. Hence, they were of multiple origin with no statistical significance between either study group ( $P = 0.52$ ) as shown in Table 2. Psychological/somatic symptoms of depression displayed highest significance of difference between groups ( $P < 0.001$ ) as shown in Table 3. Relative to non-diabetic females with vulvodynia, females with diabetes and vulvodynia had a twofold rate of co-morbid diagnosis of fibromyalgia (OR = 2.3; 95% CI 0.58-9.11), together with equivalent risks for interstitial cystitis (OR = 1; 95% CI 0.22-4.38) and inflammatory bowel syndrome (OR = 1.31; 95% CI 0.36-1.59) as shown in Table 4. Arising from the present study, it can be concluded that there was a raised incidence of vulvodynia in diabetic as opposed to non-diabetic middle-aged females, the increase being highly significant (50% vs. 25%,  $P < 0.0001$ ). In the cotton swab test, diabetic females with vulvodynia exhibited the highest number of positive test areas as compared to non-diabetic females (i.e. 80% vs. 40%,  $P = 0.001$ ).

The severity scale for vulvodynia in diabetic against non-diabetic individuals disclosed a substantial difference for those reporting the more severe symptoms (score 1: 10% vs. 16%, score 2: 10% vs. 44%, score 3: 80% vs. 40%,  $P < 0.0001$ ). Pain type in diabetic and non-diabetic middle-aged females with vulvodynia (provoked 36% vs. 24%, unprovoked 52% vs. 72%, mixed 12% vs. 4%,  $P = 0.22$ ). Pain descriptors in diabetic and non-diabetic middle-aged females with vulvodynia, aching 10% vs. 12%, stinging 10% vs. 12%, burning 60% vs. 60%, stabbing 20% vs. 16%,  $P = 0.9$ , with no significant difference. Co-morbid conditions in diabetic and non-diabetic middle-aged females with vulvodynia. Relative to non-diabetic females with vulvodynia, females with diabetes and vulvodynia had nearly two times the rate of co-morbid diagnosis of fibromyalgia (OR = 1.31; 95% CI 0.4-1.6). Birth control methods in diabetic and non-diabetic females with vulvodynia, (hormonal 10% vs. 12%, condoms 52% vs. 67%, IUD/vasectomy/hysterectomy 6% vs. 1%,  $P = 0.40$ , with no significant difference. Regarding psychological symptoms of depression in diabetic and non-diabetic middle-aged females with vulvodynia, the odds ratios demonstrated that females with diabetes had nine times the incidence

of psychological symptoms of depression (OR = 9.3; 95% CI 1.0-88.6) and an even higher risk for symptoms of somatic depression (OR = 180; 95% CI 28.1-1154.3).

In conclusion, the present study has assessed the prevalence of vulvodynia in diabetics compared to non-diabetics (50% vs. 25%,  $P < 0.001$ ) and this will provide the basis for a future phase of study i.e. a specific drug formulation under development which may be applied for the management of vulvodynia pain.

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## DISCLOSURE

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