

## Assessment of The Prevalence of Pelvic Floor Disorders in Both Vaginal and Cesarean Deliveries and Their Impact on The Quality of Life

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### ABSTRACT

**Background:** Pelvic floor disorders (PFDs) occurring in women comprises a broad range of clinical scenarios such as pelvic organ prolapse (POP) and stress urinary incontinence (SUI).

**Aim of the work:** The objectives of the present study were to estimate differences in the prevalence of pelvic floor disorders (POP & SUI) in Egyptian women by mode of delivery and their impact on patients' quality of life using assessment questionnaire.

**Materials and Methods:** This observational (non-interventional) cohort study was conducted on 464 parous women from the gynecologic out-patient clinic of Ain Shams Maternity University Hospital for measuring the prevalence of POP and UI regards the mode of delivery in women delivered 5 years back or more and its impact on the quality of their lives. Pelvic organ support was assessed using the Pelvic Organ Prolapse Quantification method (POP-Q), and pelvic floor symptoms were evaluated using assessment questionnaire.

**Results:** Our study found that compared to Cesarean Section (CS; 32.8%), vaginal delivery (VD) was associated with statistically significant increase in the occurrence (43.5%) and severity (Moderate-to-severe UI [39.6% in VD vs. 10.5% in CS]) of UI especially SUI (VD vs. CS: 62.4% vs. 51.3%). Vaginal delivery was associated with more than double the occurrence of POP (19.4% vs. 8.2% in CS), and more than triple the concomitant occurrence of both POP and SUI (9.9% vs. 2.6% in CS).

**Conclusion:** There is a positive correlation between the mode of delivery - as an independent factor - and the prevalence of pelvic floor disorders (both pelvic organs prolapse & urinary incontinence) in parous women.

**Keywords:** Pelvic organ Prolapse -Urinary incontinence - Pelvic Floor Disorders -Vaginal delivery - Cesarean Section.

### INTRODUCTION

Pelvic floor disorder has been defined as the presence of symptoms of UI or fecal incontinence (FI), pelvic organ prolapse (POP), sensory or emptying abnormalities of the lower urinary tract, defecation dysfunction, sexual dysfunction (SD) and chronic pain syndromes, which can present separately or coexist<sup>(1)</sup>. The most common conditions subsumed under the term 'female pelvic floor dysfunction' are urinary incontinence followed by female pelvic organ prolapse<sup>(2)</sup>. Concomitant occurrence of POP and SUI is a common condition because both entities are believed to result from pelvic floor damage due to fascial defects, muscular weakness, or denervation injuries. However, women with coexisting POP and deficit of the stress continence mechanism may be subjectively continent because the descent of the bladder base may mechanically kink or compress the urethra. In these cases, SUI may be revealed only after prolapse reduction and is defined as occult SUI<sup>(3)</sup>.

Pelvic organ prolapse can be considered herniation of pelvic organs, that is, of bladder, uterus, small bowel and/or rectal ampulla through the levator hiatus. The hernial portal is the 'levator hiatus' (i.e. the opening in the pelvic floor muscle

or 'levator ani', which allows the urethra, vagina and ano-rectum to transit the abdominal envelope)<sup>(4)</sup>. In women, SUI is the involuntary loss or leakage of urine from the urethra during increases in intraabdominal pressure, which is not accompanied by the sensation of urinary urgency. The relative frequency of occurrence of SUI is 50% among women with urinary incontinence, and considering the age of patients, in 15-20% of women aged 40-60, on average<sup>(5)</sup>. The etiology is multi-factorial and is associated with pregnancy and childbirth, increasing infant birth weight, ageing, chronic cough, regular heavy lifting and obesity<sup>(6)</sup>.

A normal vaginal delivery causes significant strain on the pelvic floor and can result in some women of fertile age developing urinary incontinence. Vaginal delivery is an even a greater risk factor for pelvic organ prolapse. Birth weights, mode of delivery and length of the second stage of labor have been shown to be additional risk factors<sup>(7)</sup>. Caesarean section may protect against urinary incontinence in women of fertile age, but the effect does not persist when the women become older<sup>(8)</sup>. Many women with objective prolapse are asymptomatic and do not need treatment. The most common symptoms

associated with POP are those of a vaginal lump or bulge, or a 'dragging' sensation. In younger women, vaginal laxity is more commonly noticed and related to sexual dysfunction. Excessive movement of prolapsing tissues can cause dyspareunia. At times, a prolapse will impair voiding, which can occur with urethral kinking or be caused by urethral compression by a low cervix (especially if the uterus is retroverted), an enterocele or a rectocele <sup>(4)</sup>.

Thus, the main goal of our study was to evaluate the differences in prevalence of pelvic floor disorders (POP & UI) in Egyptian women by mode of delivery and their impact on patients' quality of life using assessment questionnaire.

### PARTICIPANTS AND METHODS

This study is observational (non-interventional) cohort study done in Ain Shams University Maternity Hospital. It included 464 parous women from the gynecologic out-patient clinic of Ain Shams Maternity University Hospital for measuring the prevalence of any type of pelvic organ prolapse and stress urinary incontinence regarding the mode of delivery in women who delivered 3 times or more, 5 years back or more and its impact on the quality of their lives. These patients were interviewed and examined at the clinic. Women with multiple pregnancies, previous prolapse surgery, medical disorders including inflammatory bowel disease and collagen disorders were excluded. Demographic data such as age, parity, body mass index (BMI) and obstetric details including gestational age and mode of delivery were collected. The assessment of POP was diagnosed and graded by Pelvic Organ Prolapse quantification (POP-Q) system which is an objective site-specific system for describing, quantifying, and staging pelvic support in women <sup>(9)</sup>. Prolapse was evaluated by a standard system relative to clearly defined anatomic points of reference. The impact of UI on the patients' life style was assessed using 'King's Health Questionnaire' with the assistance of 2 female physicians explaining it in simple Arabic to the

patients. **The study was approved by the Ethics Board of Ain Shams University.**

### Statistical analysis

The collected data have been statistically analyzed using SPSS program (Statistical Package for Social Sciences) software version 18.0. Qualitative data were expressed as mean±standard deviation (SD). Qualitative data were presented as number and percentage. Student t-test was used for the analysis of normally distributed continuous variables and the Mann-Whitney U-test was used for abnormally distributed variables. Categorical variables were presented as number and percentage and inter-group differences were compared using Fisher's exact test (for nominal data) or the chi-squared test for trend (for ordinal data). *p* value of < 0.05 indicated statistical significance.

### RESULTS

In the current study, we found no significant difference between study groups regarding demographic characteristics (**Table 1**). **Table (2)** showed that the frequency of incontinence, POP and both of them together were significantly more frequent among VD group than among CS group. Also, **Table (3)** showed that mild grades of incontinence and stress urinary incontinence were the most frequent in both groups. Higher grades of incontinence were significantly higher in VD group than in CS group. Stress and mixed types were significantly higher in VD group than in CS group. Different incontinence-related quality of life subscales were significantly higher in VD group than in CS group. The present data in **table (4)** showed that different aspects of incontinence-related quality of life subscales were significantly higher in VD group than CS group. **Table (5)** showed that mild grade, anterior POP and asymptomatic POP were the most frequent in both groups. VD group had significantly more frequent high POP grades, symptomatic POP and multiple positions of POP than CS group.

**Table (1): Comparison between study groups regarding demographic characteristics**

Variable	Vaginal Delivery(VD) (N=232)	Cesarean Section(CS) Group(N=232)	p-value
Age (years)	41.9±2.9	42.1±2.8	^0.466
BMI (kg/m <sup>2</sup> )	29.2±2.2	29.3±2.1	^0.890
Parity	3.9±0.8	3.8±0.7	^0.180
Last delivery (years)	12.2±3.4	12.5±3.6	^0.286
Age at Last delivery(years)	33.4±5.2	33.2±4.5	^0.718
Smoking	1 (0.4%)	3 (1.3%)	#1.000

^Independent t-test. Data were represented as mean ±S.D. #Fisher's Exact test, \*Significant

**Table (2): Comparison between study groups regarding incontinence and POP**

Variables	VD (N=232)	CS (N=232)	P-value
Incontinence	101 (43.5%)	76 (32.8%)	0.017*
POP	45 (19.4%)	19 (8.2%)	<0.001*
Both	23 (9.9%)	6 (2.6%)	<0.001*

\*Significant

**Table (3): Comparison between study groups regarding incontinence characteristics**

Variables	Measures	VD (N=101)	CS (N=76)	P-value
Grade of incontinence	Mild	61 (60.4%)	68 (89.5%)	<0.001*
	Moderate	27 (26.7%)	5 (6.6%)	
	Severe	13 (12.9%)	3 (3.9%)	
Type of incontinence	Stress	63 (62.4%)	39 (51.3%)	0.040*
	Urgent	30 (29.7%)	35 (46.1%)	
	Mixed	8 (7.9%)	2 (2.6%)	

\*Significant.

**Table (4): Comparison between study groups regarding incontinence-related quality of life**

	VD (N=101)	CS (N=76)	^P-value
General health	54.0±26.4	41.8±19.7	<0.001*
Incontinence Impact	42.9±28.4	28.9±25.1	<0.001*
Role limitation	54.5±24.1	46.7±19.8	0.024*
Physical limitation	54.1±23.7	44.5±20.6	0.005*
Social limitation	55.6±23.1	47.1±21.3	0.014*
Personal limitation	52.7±22.6	43.1±19.7	0.004*
Emotions	58.2±20.9	45.9±20.2	<0.001*
Sleep and energy	52.6±25.7	44.5±20.4	0.025*
Severity measure	53.0±20.6	44.4±18.7	0.005*

^Independent t-test, \*Significant

**Table (5): Comparison between study groups regarding POP characteristics**

Variables	Measures	VD (N=45)	CS (N=19)	P-value
Stage (POP-Q)	Stage I	23 (51.1%)	16 (84.2%)	0.033*
	Stage II	2 (4.4%)	1 (5.3%)	
	Stage III	16 (35.6%)	1 (5.3%)	
	Stage IV	4 (8.9%)	1 (5.3%)	
Anatomical position	Anterior	18 (40.0%)	10 (52.6%)	0.025*
	Posterior	1 (2.2%)	4 (21.1%)	
	Apical	4 (8.9%)	1 (5.3%)	
	Multiple	22 (48.9%)	4 (21.1%)	
Clinical picture	Symptomatic	19 (42.2%)	3 (15.8%)	0.042*
	Non-	26 (57.8%)	16 (84.2%)	

\*Significant

## DISCUSSION

Pelvic floor dysfunctions caused by pregnancy and delivery are multifactorial and include urinary and anal incontinence, urge symptoms, anatomical changes of pelvic organ support, sexual dysfunction and perineal pain. Vaginal delivery (VD) is a major risk factor for pelvic organ prolapse (POP)<sup>(10)</sup>. The effect of caesarean delivery on POP is controversial as some studies have shown it to have a protective effect, while others have not<sup>(10)</sup>. The main purpose of the present study was to estimate differences in prevalence of pelvic floor disorders (POP & SUI) in Egyptian women by mode of delivery and their impact on patients' quality of life using assessment questionnaire. In our study, the overall prevalence of SUI is 38.15%, estimated to be 43.5% for those who gave birth vaginally exclusively, compared to 32.8% in the CS only group  $\geq 5$  years after the last birth. Our findings are in accordance with previous study which was carried out on 15,307 Norwegian women enrolled in the Epidemiology of Incontinence in the County of Nord-Trøndelag (EPINCONT) study, the prevalence of SUI was 6.9% in the CS group and 12.2% in the VD group. In this study, VD was associated with a greater increase in risk for any UI. Also VD was associated with increased the risk of SUI compared to CS group with OR (CI 95%) = 2.4 (1.7–3.2). Although this study goes with ours stating that SUI prevalence increases with the VD but their prevalence is much lower than ours that is may be because they targeted different age group (i.e all women older than 20 years old) and a different ethnicity (i.e. Scandinavians). The difference in the prevalence may be also attributed to the big difference between the mode of delivery groups in their study (669 women in the CS group vs 11299 women in the VD group)<sup>(11)</sup>.

Also another study found among 4,200 women 6 years after the delivery that those in VD group had a prevalence of UI around 26 % versus 14 % prevalence among those who had only given birth by CS<sup>(12)</sup>. These findings agrees with our study in that the prevalence of UI is higher in the VD group but their different numbers can be attributed to that they sought the prevalence of the UI in general not targeting the SUI in specific and they also choose the 1<sup>st</sup> delivery as their index delivery while we choose the last delivery as our index delivery to search the prevalence of SUI five years after it.

Regarding to the impact of UI on the quality of life (QoL) of the incontinent women not

only their physical well-being but also their psychological and socioeconomic wellbeing using the King's Health Questionnaire (KHQ) - our study showed that the UI negatively impacted the QoL of the affected women in both groups with more affection (i.e. worse impact on the quality of life) on incontinent women of the VD group. The study showed that more women in the VD group self-described their general health condition at the time of the interview as worse than those incontinent women of the CS group with their KHQ subscale scores (Mean $\pm$  SD) 54.0 $\pm$ 26.4, 41.8 $\pm$ 19.7 respectively ( $P < 0.001$ ). Also, more incontinent women in the VD group attributed that negative impact on their QoL to the UI than in the CS group with their KHQ subscale scores (Mean $\pm$  SD) 42.9 $\pm$ 28.4, 28.9 $\pm$ 25.1 respectively ( $P < 0.001$ ).

Among the different aspects of life affected by UI the emotional problems had the most negative impact on QoL of the incontinent women in VD group with KHQ subscale score (Mean $\pm$  SD) of 58.2 $\pm$ 20.9 while the least affected aspect of life affected are the personal relationships and their sleep pattern (either insomnia &/or feeling tired) almost equal as their KHQ subscale scores (Mean $\pm$  SD) 52.7 $\pm$ 22.6, 52.6 $\pm$ 25.7 respectively. While among incontinent women within the CS group the most negatively affected aspect of life was their physical/social activities with KHQ subscale score (Mean $\pm$  SD) = 47.1 $\pm$ 21.3. The least affected aspect was their personal relationships - similar to the VD group - with KHQ subscale score (Mean $\pm$  SD) = 43.1 $\pm$ 19.7.

Regarding to taking any severity measures as wearing pads and/or decreasing their fluid intake derived by getting wet those incontinent women of the VD group got higher subscale scores (worse) than those in the CS group with their KHQ subscale scores (Mean $\pm$  SD) 53.0 $\pm$ 20.6 VS 44.4 $\pm$ 18.7 respectively. Our study also showed that other related lower urinary tract symptoms are reported as more distressing in the VD group than the CS group (i.e. more incontinent women in the VD group reported having these symptoms moderately/a lot than in the CS group).

Regarding to POP prevalence, our study found that it was 19.4% in the VD group which is more than double its prevalence in the CS group (8.2%) while the prevalence of concomitant POP and UI was more than tripled in the VD group (9.9%) than in the CS group (2.6%). Regarding the POP characteristics our study stated that the VD

group had significantly higher POP stages, more symptomatic POP and more frequent multiple compartment prolapse than the CS group (i.e. more severe forms of POP).

Our results are in agreement with **Rortveit G et al.**<sup>(13)</sup> who found that the prevalence of symptomatic POP in the whole VD group (7%) is more than double its prevalence in those delivered by CS only (3%). It also increased to triple the prevalence (9%) in those who gave birth to 3 or more vaginal deliveries. This study results are also agrees with our results but it came up with different prevalence. This may be due to its sample different ethnicity and also this study included only symptomatic patients not both symptomatic and non-symptomatic patients like ours.

### CONCLUSION

Our findings suggested that there is a positive correlation between the mode of delivery - as an independent factor - and the prevalence of pelvic floor disorders (both pelvic organs prolapse & urinary incontinence) in parous women. UI negatively impacted the QoL of the affected women, with more affection to all aspects of incontinence-related quality of life in women of the VD group compared to those women of the CS group.

### REFERENCES

- Durnea CM, Khashan AS, Kenny LC et al. (2014):** Prevalence, etiology and risk factors of pelvic organ prolapse in premenopausal primiparous women. *Int. Urogynecol J.*, 25(11):1463-70. doi: 10.1007/s00192-014-2382-1.
- Dietz HP (2011):** Female pelvic floor dysfunction--an imaging perspective. *Nat.Rev. GastroenterolHepatol.*, 9(2):113-21. doi: 10.1038/nrgastro.2011.213.
- Zacharakis D, Grigoriadis T, Kastanias Set al. (2016):** Occult Stress Urinary Incontinence in Women With Pelvic Organ Prolapse: Is the One Step Surgical Approach a Risky Choice?. *Female Pelvic Med. Reconstr Surg.*, 22(1):55-9. doi: 10.1097/SPV.0000000000000226.
- Dietz HP (2015):** Pelvic organ prolapse - a review. *Aust. Fam. Physician*,44(7):446-52.
- Chmaj-Wierzchowska K, Pięta B, Kotecka M, Michalak M et al. (2012):** Three most important etiological factors of occurrence stress urinary incontinence in nulliparous pre- and postmenopausal Polish women. *Ann. Agric. Environ Med.*,19(3):581-5.
- Cooper J, Annappa M, Dracocardos D, Cooper Wet al. (2015):**Prevalence of genital prolapse symptoms in primary care: a cross-sectional survey. *Int. Urogynecol. J.*,26(4):505-10. doi: 10.1007/s00192-014-2556-x.
- Aydın S, Tuncel MA, Aydın ÇA and Ark C (2014):** Do we protect the pelvic floor with non-elective cesarean? A study of 3D/4D pelvic floor ultrasound immediately after delivery. *J. Obstet. Gynaecol. Res.*,40(4):1037-45. doi: 10.1111/jog.12303.
- Rortveit G and Hannestad YS (2014):** Association between mode of delivery and pelvic floor dysfunction. *Tidsskr Nor. Laegeforen.*,134(19): 1848-52. doi: 10.4045/tidsskr.13.0860.
- Persu C, Chapple CR, Cauni V, Gutue S and Geavlete P (2011):** Pelvic Organ Prolapse Quantification System (POP-Q) - a new era in pelvic prolapse staging. *J. Med. Life*,4(1):75-81.
- DeLancey JOL (2005):** The hidden epidemic of pelvic floor dysfunction: achievable goals for improved prevention and treatment. *Am. J. Obstet Gynecol.*,192:1488e95.
- Rortveit G, Daltveit AK, Hannestad YS and Hunskaar S (2003):** Urinary incontinence after vaginal delivery or cesarean section.Norwegian EPINCONT Study. *N. Engl. J. Med.*,348(10):900-7.
- MacArthur C, Glazener C, Lancashire R, Herbison P and Wilson D(2011):** Exclusive caesarean section delivery and subsequent urinary and faecal incontinence: a 12-year longitudinal study. *BJOG.*,118(8):1001-7. doi: 10.1111/j.1471-0528.2011.02964.x.
- Rortveit G, Brown JS, Thom DH et al. (2007):** Symptomatic Pelvic Organ Prolapse: Prevalence and Risk Factors in a Population-Based, Racially Diverse Cohort. *Obstet. Gynecol.*, 109(6):1396-403.