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Research Article

Prevalence of Pelvic Congestion Syndrome in Gynecological Out-patient Clinic of Damietta University Hospital

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ABSTRACT

Background: Pelvic congestion syndrome (PCS) is a well-recognized cause of chronic pelvic pain (CPP), representing over 30% of patients with CPP. The diagnosis of PCS is still challenging due to the variability in clinical presentations and relatively low sensitivity of imaging techniques. There is a scarcity of evidence regarding prevalence of PCS among CPP patients in hospital-based settings.

Aim of the work: to detect the prevalence of pelvic congestion syndrome among female patients suffered from unexplained chronic pelvic pain in Gynecological outpatient clinic of Al-Azhar Damietta University Hospital.

Patients and Methods: This was a cross-sectional screening study included 165 adult female patients with CPP and screened for PCS by detailed clinical history, examination, and doppler ultrasonography.

Results: Of the 165 patients, 25 patients were diagnosed with PCS with a prevalence of 15.1%. Patients with PCS showed significantly increased incidence of dysuria ($P = 0.049$), dyspareunia ($P < 0.001$), venous reflux ($P < 0.001$), ovarian vein dilatation ($P < 0.001$), and para-uterine veins dilatation ($P < 0.001$). There was no statistically significant difference in incidence of urinary frequency, urinary urgency, abnormal uterine bleeding, backache, and vulvar and lower limb varicosities ($P > 0.05$).

Conclusion: The prevalence of PCS in our sample was 15.1%. PCS patients demonstrated significantly increased incidence of dysuria, dyspareunia, venous reflux, ovarian vein dilatation, and para-uterine veins dilatation. Large population-based studies are needed to determine the actual incidence of PCS.

Keywords: Pelvic congestion; Syndrome; Chronic pelvic pain; Pelvic varicosities; Venous reflux.

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INTRODUCTION

Pelvic congestion syndrome (PCS) is a condition that results from incompetent pelvic veins, causing chronic pelvic pain (CPP) in women. The indicators of incompetent veins comprise dysfunctional dilatation of ovarian (OV) and para-uterine veins (PV), slow blood flow (congestion), retrograde flow and reflux [1].

Pelvic congestion syndrome (PCS) is probably one of the worst names for a medical condition. It covers a collection of symptoms and signs both inside and outside the pelvis, most doctors and nurses still have difficulty in comprehending this condition [2].

The incidence of CPP in women aged between 18 and 50 has been estimated as 15%. It constitutes 10–40% of all outpatients' gynecological visits, 35% of diagnostic laparoscopies and 15% of all hysterectomies have been performed because of the reported chronic pelvic pain [3].

The etiology of CPP is not completely understood and it could be related to chronic processes of complex interaction among the gastrointestinal, urologic, genital, and musculoskeletal systems Moreover women with CPP usually report co-existing diseases such as endometriosis, pelvic inflammatory disease, pelvic adherences, irritable bowel syndrome, interstitial cystitis, and fibromyalgia [4].

Until now, there are no identified cross-sectional studies on the diagnosis and prevalence of PCS among patients presenting with CPP in outpatient clinics. To the best of our knowledge, this is the first cross-sectional study to evaluate and screen CPP patients for PCS in obstetrics and gynecology outpatient clinics.

AIM OF THE WORK

The aim of this study was to detect the prevalence of pelvic congestion syndrome by examining pelvic or gonadal veins in female patients suffered from unexplained chronic pelvic pain in Gynecological outpatient clinic of Al-Azhar Damietta University Hospital.

PATIENTS AND METHODS

This is a cross-sectional screening study conducted at the outpatient obstetrics and gynecology clinic at Al-Azhar university hospital, Damietta, Egypt. Institutional Review Board (IRB) approval was acquired, and all patients were aware of the study and signed an informed consent form.

We included 165 adult female patients of any age with chronic pelvic pain lasting six months or more and the cause of the pain was not clear in absence of pelvic pathology. Patients with the following criteria were excluded: presence of pelvic pathology including fibroids, adenomyosis, and endometriosis; patients with abdominal aortic aneurysm or dissection, pelvic inflammatory disease, ascites, and previous extensive pelvic surgery.

All patients underwent full history taking including: age, parity, previous pelvic surgeries, symptoms as dyspareunia, dysuria, urgency, frequency, and backache. Detailed history of chronic pelvic pain was acquired to identify the underlying cause, asking the patient about site of pain and its maximal point, onset, character of pain, associated symptoms, and radiation; as pain from cervix, vagina or uterus often radiates to the lower back or buttocks, pain from ovaries may radiate into medial thigh. Full general and abdominal examination was done for exclusion of pelvi-abdominal swelling, surgical scars, and trigger points. Also, a local examination by speculum performed gently to limit exacerbation of pain and exclusion of any cervical lesion. The external genitalia were examined for signs of infection, inflammatory dermatologic conditions, vulvar malignancy, and neurogenic etiologies.

Transvaginal ultrasonography was done for screening of pelvic pathologies and followed by transvaginal Doppler ultrasonography using GE Voluson S10;endo microconvex probe(IC9-RS) with frequency 3.6 – 10 MHZ at our department and at diagnostic radiology department using GE Voluson E6;endocavitary microconvex probe (IC 5-9-D) with frequency 4-9 MHZ.

Transvaginal transducer was necessary (Voluson S10 and Voluson E6 machines), with the system optimized for highest resolution possible at depth of pelvic organs. Resolution was set as a preference over frame rate, with highest frequency setting selected for the transducer. Color PRF was optimized for low-velocity flow (5–8 cm/s). During the Doppler study, consent was taken, and the nature of examination informed to the patient. The transducer was covered with an appropriate probe cover and sterile lubricant. Empty bladder was preferred. We used a very gentle scan technique to avoid compression or distortion of vascular anatomy. A survey of the entire pelvis was made in both longitudinal and coronal planes to assess anatomical orientation and pathology of the pelvic organs. Thereafter, coronal, or coronal/oblique planes were most useful for evaluating the trunks and their tributaries. We Angled the transducer into right and left lateral fornixes of the cervix to view parauterine veins and ovarian veins (OVs). Anterior and posterior fornixes were useful for imaging anterior and posterior vaginal wall, urethra, and anal ring.

Patients were ordered to perform a breath-holding technique or moderated forced attempted exhalation against closed airway (Valsalva's maneuver). Scans were evaluated to detect the largest diameters of ovarian and para-uterine veins bilaterally along with associated venous reflux. According to the literature, an ovarian vein diameter of 6 mm or more in the axial plane was considered dilatation [5] (Figures 1-5).

The results were collected, tabulated, and statistically analyzed using IBM personal computer and statistical package SPSS version 11. Frequencies and percentages were used in

description of categorical data, while means and standard deviations were used for presentation of quantitative data. The Chi-squared test was used to test for association between two categorical variables and Cramer's V was implemented for assessing the magnitude of the association in cases of significant chi-squared test. Also, the independent samples t-test was used to test for statistical difference of normally distributed quantitative data and Mann-Whitney U test was used for quantitative data that was not normally distributed.

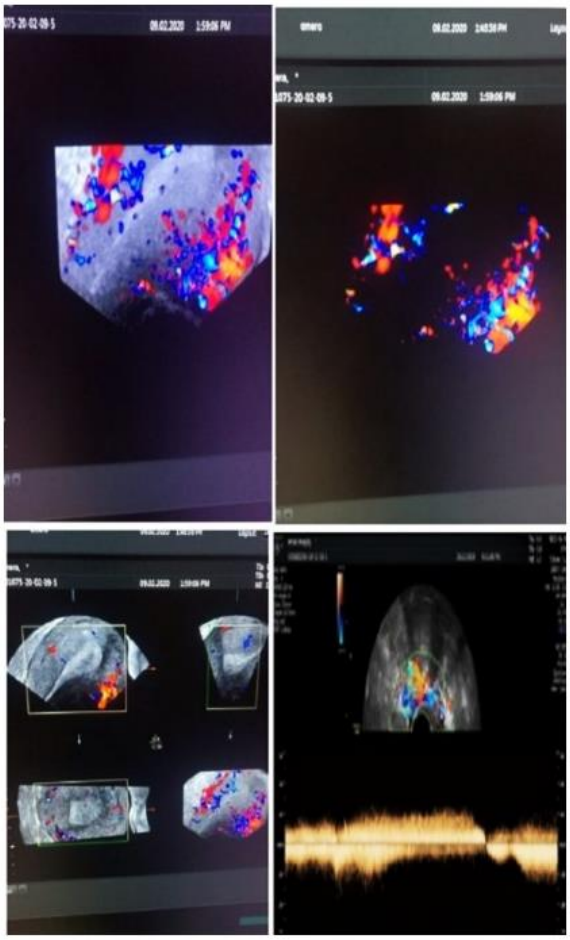

Figure (1): Transvaginal color & 3D Power Doppler showing bilateral uterine varicosities with bilateral venous reflux.

Figure (2): Dilated para uterine veins using power color& power Doppler

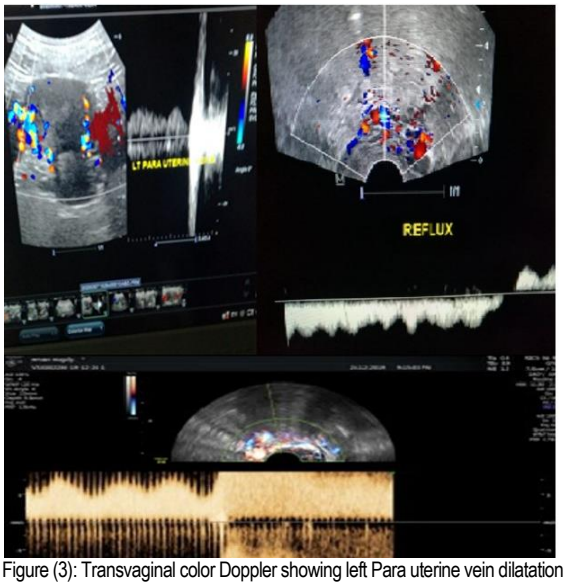

Figure (3): Transvaginal color Doppler showing left Para uterine vein dilatation with reflux.

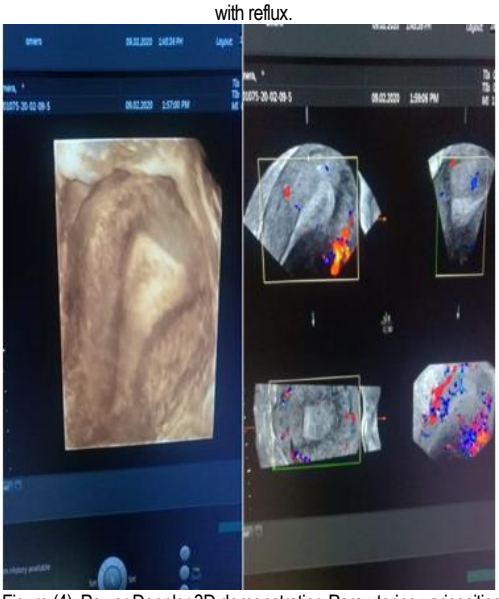

Figure (4): Power Doppler 3D demonstrating Para uterine varicosities.

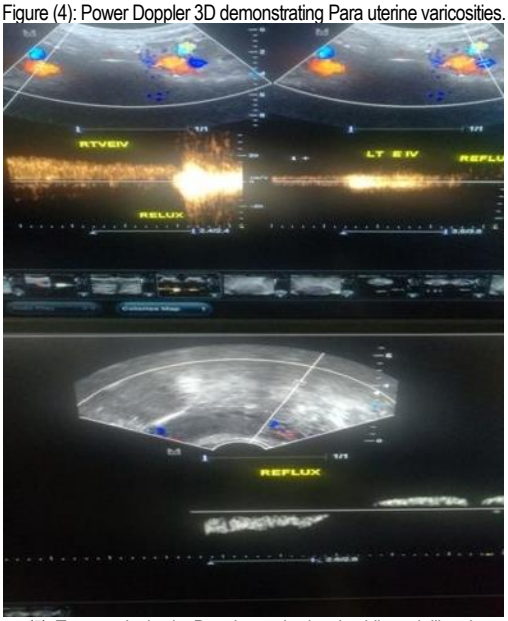

Figure (5): Transvaginal color Doppler study showing bilateral dilated ovarian veins with reflux.

RESULTS

A total of 165 patients with chronic pelvic pain with unclear pelvic pathology were included in our study. The mean age was 40 years. Of the 165 patients, 143 were married, 9 divorced, and 13 widows. Twenty-five patients were diagnosed with PCS with a prevalence of 15.1% in our sample. There was a statistically significant difference in age between both patient groups (*P* = 0.002). The mean age for patients with PCS was 35 years and 41 years in patients without PCS. Moreover, there was no statistically significant difference regarding marital status, parity, number of CS, and previous pelvic surgeries. Table 1 shows the basic characteristics of study participants.

Of all studied symptoms and signs, the most frequent include backache, dyspareunia, and dysuria, respectively. Backache was reported in 149 patients (90%), dyspareunia in 105 patients (63%), and dysuria in 103 patients (62%). The least frequent were urgency (30 patients, 18%), vulval varicosities (36 patients, 21%) and lower limb varicosities (53 patients, 32.1%) . There was a statistically significant association between dysuria and PCS (P = 0.04). On comparison, patients with PCS reported higher incidence of dysuria (80%) than in patients without PCS (59%) (Table 2).

Regarding urinary frequency, there was a higher prevalence in PCS group (52%) compared with No PCS group (45%). However, this difference was statistically insignificant (P = 0.5). In contrast, incidence of urgency was higher in No PCS group (20%) than PCS group (8%), however, the difference was statistically non-significant (P = 0.15). A significant association between PCS and dyspareunia was found (P < .001). 96% of patients with PCS reported having dyspareunia, compared with 57% in patients without PCS. AUB incidence was insignificantly higher in patients without PCS (53%) than in patients with PCS (48%) (P = 0.6). Additionally, backache incidence was insignificantly higher in PCS group (96%) than No PCS group (89%). The incidence of both vulval and lower limb varicosities was higher in PCS group. Vulval varicosities were present in 32% of patients with PCS and in 20% of patients without PCS. Lower limb varicosities were present in 48% of patients with PCS and in 29.2% of patients without PCS. However, there was no significant difference between both patient groups for varicosities incidence (P > 0.05) (Table 2).

There was a highly significant association between PCS and all studied ultrasonographic findings. Venous reflux was observed in all 25 patients with PCS (100%) and in 39 patients without PCS (28%) (P < 0.001, Cramer's V = 0.53), denoting high association between venous reflux and PCS. Ovarian vein dilatation was detected in 23 patients of PCS group (92%) and in 31 of No PCS group (22%) (P < 0.001, Cramer's V = 0.53), denoting high association between ovarian vein dilatation and PCS. Para-uterine veins dilatation was observed in 20 patients of PCS group (80%) and in 36 of No PCS group (25%) (P < 0.001, Cramer's V = 0.41), denoting moderate association between ovarian vein dilatation and PCS (Table 3).

Table (1): Basic characteristics of study participants.

Variables		PCS (n=25)	No-PCS (n=140)	Total (n=165)	*P*-value
Age		35.6±7	41.4±8.5	40.57±8.54	0.002*
Marital status	Married	24 (96%)	119 (85%)	143 (86.6%)	0.2
	Divorced	1 (4%)	8 (5.7%)	9 (5.4%)	
	Widow	0 (0%)	13 (9.2%)	13 (7.8%)	
Parity		2.8±1.2	3.6±1.5	3.4±1.4	0.1
Number of CS		1.8±1.7	1.5±1.4	1.5±1.4	0.4
Previous pelvic surgeries		10 (40%)	42 (30%)	52 (31.5%)	0.3

*Statistically significant result; PCS: Pelvic congestion syndrome

Table (2): Demographic data of the study population

Variables	PCS (n=25)	No PCS (n=140)	Total (n=165)	P-value
Dysuria	20 (80%)	83 (59.2%)	103 (62.4%)	0.049*
Frequency	13 (52%)	64 (45.7%)	77 (46.6%)	0.5
Urgency	2 (8%)	28 (20%)	30 (18.1%)	0.15
Dyspareunia	24 (96%)	81 (57.8%)	105 (63.6%)	<0.001*
AUB	12 (48%)	75 (53.5%)	87 (52.7%)	0.6
Backache	24 (96%)	125 (89.2%)	149 (90.3%)	0.2
Vulval varicosities	8 (32%)	28 (20%)	36 (21.8%)	0.18
Lower limb varicosities	12 (48%)	41 (29.2%)	53 (32.1%)	0.065

*Statistically significant result; PCS: Pelvic congestion syndrome

Table (3): Doppler Ultrasound Pattern among study populations

Variables	PCS (n=25)	No PCS (n=140)	Total (n=165)	*P*-value
Venous reflux	25 (100%)	39 (27.8%)	64 (38.7%)	< 0.001*
Ovarian vein dilatation	23 (92%)	31 (22.1)	54 (32.7%)	< 0.001*
Para-uterine veins dilatation	20 (80%)	36 (25.7)	56 (33.9%)	< 0.001*

DISCUSSION

The purpose of this study was to investigate prevalence of PCS and its associated symptoms and signs among patients with chronic pelvic pain attending the outpatient obstetrics and gynecology clinic. To the best of our knowledge, this is the first hospital based cross-sectional study to screen for incidence of PCS and its associated presentation patterns among CPP patients.

The prevalence of PCS in our sample was 15 % (25 out of 165 patients). This result is in line with the previously reported incidence that ranged from 10% to 30% [6, 7] and some authors even report the incidence up to 40% of all CPP complaints [2, 8, 9]. It is estimated that 10% of the population have pelvic varicosities and of them around 60% may present with PCS [10, 11]. However, it is difficult to determine the true incidence of PCS, due to the variability in symptoms and absence of generally accepted cut-off parameters or criteria for diagnosis [12].

Typical presentations of PCS that are frequently reported include: chronic noncyclic pain or heaviness that increases with prolonged sitting or standing, deep dyspareunia, dysmenorrhea, dysuria, urgency, and perineal or lower limb varicosities [13-15]. Most of the complaints are painful symptoms which affect the quality of life of patients. The right clinical identification and interpretation of these symptoms with aid of radiological investigation could increase the diagnosis of PCS. One study found that the combined presence of ovarian point tenderness along with a history of post-coital pain was 94% sensitive and 77% specific for PCS [16].

The origin and pathophysiology of PCS related pain are not clearly understood. It is hypothesized that the venous distension and chronic stretch of the venous wall lead to secretion of inflammation and pain inducing compounds such as substance P and neurokinins A and B; also venous distension may cause compression on adjacent nerves in the pelvis contributing to production of the pain [17]. Another unclear presentation is the presence of urinary symptoms in patients with PCS in absence of any urinary tract pathology. It was reported that the incidence of urinary symptoms in patients with pelvic varicosities was associated with varicosities in the bladder trigone inducing such symptoms [5, 14].

The identification of many asymptomatic patients with pelvic varicosities raised the questioning of the causal relationship between CPP and PCS and made PCS a more challenging diagnosis [13, 18, 19]. Rozenblit et al. found a 43% prevalence of asymptomatic pelvic varicosities [18]; while Koc et al. found a 18% prevalence [20], along with a 10% prevalence in Jurga-Karwacka et al. study [5].

It is not clear till now why some patients with pelvic varicosities have pain while others do not. This phenomenon can be compared to chronic venous insufficiency of lower limbs while also not all patients experience pain or symptoms, and treatment is only assigned to symptomatic patients. The questioning of the causal relationship that raised by some authors is faced by many studies that observed and studied the association between CPP and pelvic varicosities and reached to some extent to a consensus on an established association between CPP and pelvic varicosities. In 1984, Beard et al. performed a fundal venography on 63 women and were divided in three groups: 45 women with CPP and no identified pathology at laparoscopy, 10 with CPP and endometriosis, and eight patients with no pain or pathology as controls. They demonstrated a statistically higher OV dilatation in idiopathic CPP group compared with the other two groups [21].

In this study, there is a highly significant association between CPP and pelvic varicosities. In a Korean study, they included two patient groups: a group with clinical evidence of PCS with no identified pathology in the US and another group with age matched healthy controls. A venography was performed, and they found a statistically higher ovarian vein dilatation in PCS group compared to controls. Also, they found 100% incidence of pelvic varices in PCS group and 17% in control group, which agrees with our results. However, another study found that the degree of OV dilatation was not correlated with the degree of pain in symptomatic PCS patients [22].

Pelvic varicosities and CPP usually present in pre-menopausal women who are younger than 45 and reproductively active [15, 23]. Our results demonstrated a statistically significant difference in age between patients with and without PCS. Patients with PCS were younger with a mean age of 35 years. In a study that retrospectively assessed abdomino-pelvic CT scans of 2384 women for evaluation of their clinical presentation. They investigated the presence of CPP in patients with dilated OV on CT scan. A 2% incidence of CPP was found in all investigated women with dilated OV; however, when they stratified their analysis to premenopausal women only, the incidence increased to 8%, signifying the hypothesized association between PCS and younger age groups [5]. These results brought more attention toward the hormonal factors as a cause of PCS. Estrogen is believed to be a major factor in development of pelvic varicosities due to its venous relaxing effects and its higher concentration in

OV which is 100-fold higher than peripheral circulation [24]. Another contributing factor to the development of PCS is pregnancy. The OV capacity is increased up to 60-fold during pregnancy which may lead to a chronic post-partum venous distension; also, it is estimated that thirty percent of women will develop venous insufficiency during their first pregnancy, which can cumulate with each successive pregnancy leading to development of pelvic varicosities [25, 26].

In a study conducted by Kurt *et al.* [27], there were an association between the number of births and presence of pelvic varicosities. However, in our study, we found no association between parity and PCS. In agreement with our result, Jurga-Karwacka *et al*. did not find a statistically significant difference between patients with PCS and controls regarding parity and gravidity [5]. Also, Kim et al. reported that 63% of their study participants with pelvic varicosities were nulliparous and after treatment, they found no difference in symptomatic improvement between both parous and nulliparous women [28]. Despite all these contradictory results, still there is no clear explanation identified in the current literature.

Vulvar and lower limb varicosities are common findings in patients with PCS. During pregnancy, 2-20% of women may develop vulvar varicosities and estimated 20% may develop lower limb varicose veins [1, 26]. These changes are usually temporary and recede within six months post-partum; however, with each successive pregnancy and increasing pelvic venous engorgement, some women would eventually sustain them [1]. Furthermore, some authors suggest that the presence of vulvoperineal and pelvic varicosities may have a causal effect on development of lower limb varices [29]. The recurrence of LL varices after surgery is not uncommon; however, it was observed that the combined presence of LL varices and pelvic varicosities was associated with higher recurrence [30-32]. Therefore, it was suggested that an ultrasound screening should be done for patients with LL varices recurrence as around 50% of pelvic varicosities can be asymptomatic [30].

Conclusion: PCS is a challenging diagnosis due to the variability in symptoms and presentations. The presence of pelvic pain that increases with prolonged standing or sitting along with US evidence of pelvic varicosities in absence of other pelvic pathologies should direct the differential diagnosis toward PCS. PCS is a common medical problem with high prevalence among patients with CPP which requires more awareness toward the diagnosis and treatment. In our study, patients with PCS showed significantly increased incidence of dysuria, dyspareunia, venous reflux, ovarian vein dilatation, and para-uterine veins dilatation. For all other parameters studied, there were no significant differences between both patients with and without PCS. Large population-based studies are needed to determine the actual incidence of PCS.

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