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Sensitivity and specificity of clinical findings for the diagnosis of pelvic congestion syndrome in women with chronic pelvic pain

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Abstract

Background: Pelvic congestion syndrome is among the causes of pelvic pain. One of the diagnostic tools is pelvic venography using Beard's criteria, which are 91% sensitive and 80% specific for this syndrome.

Objective: To assess the diagnostic performance of the clinical findings in women diagnosed with pelvic congestion syndrome coming to a Level III institution.

Methods: Descriptive retrospective study in women with chronic pelvic pain taken to transuterine pelvic venography at the Advanced Gynecological Laparoscopy and Pelvic Pain Unit of Clinica Comfamiliar, between August 2008 and December 2011, analyzing social, demographic, and clinical variables.

Results: A total of 132 patients with a mean age of 33.9 years. Dysmenorrhea, ovarian points, and vulvar varices have a sensitivity greater than 80%, and the presence of leukorrhea, vaginal mass sensation, the finding of an abdominal mass, abdominal trigger points, and positive pinprick test have a specificity greater than 80% when compared with venography.

Conclusion: This study may be considered as the first to evaluate the diagnostic performance of the clinical findings associated with pelvic congestion syndrome in a sample of the Colombian population. In the future, these findings may be used to create a clinical score for the diagnosis of this condition.

Keywords

Pelvic venous insufficiency, phlebography, variocele, venography, chronic venous insufficiency

Introduction

Pelvic congestion syndrome (PCS) is defined as the presence of uterine and ovarian vein dilatation, slow flow, and pain.[1,2] Originally described by Gooch in 1831,[3] the presence of this syndrome as a cause of chronic pelvic pain (CPP) has been controversial and a source of multiple debates.

The pathophysiological mechanism involves retrograde flow through incompetent gonadal and pelvic veins resulting in painful pelvic varices.[2,4–6] The predominant symptom is unilateral or bilateral pelvic pain, usually dull and intermittent, which intensifies during the premenstrual period and while standing. It may also be accompanied by pelvic heaviness, dysmenorrhea (pain with menses), dyspareunia (pain with intercourse), lumbar pain, ovarian points (tenderness to touch over a point at the junction between the inner third and the outer third between the umbilicus and the anterior upper iliac spine), bladder irritability, perivulvar varices, and psychosocial disorders.[5,7]

Despite many advances in imaging studies, which are not the gold standard, pelvic venography (pelvic venous radiograph) has a sensitivity of 80–100%. Other imaging studies such as ultrasound, nuclear magnetic resonance, computed axial tomography, and laparoscopy are performed before venography in order to rule out

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any other pelvic disease. Although they may demonstrate pelvic venous ectasia, sensitivity of these imaging studies is low (20%, 58.6%, 12.5%, and 40%, respectively) compared with venography, so far considered as the most accurate test for the diagnosis of pelvic varices.[7–9]

The approach to pelvic venography may be transfemoral or transuterine. Transuterine pelvic venography (the recommended technique) offers several advantages, including ease of performance, the ability to visualize the uterine cavity, and lower cost. The disadvantages include a learning curve for nongynecologists, the need for a special needle, and conscious sedation. The procedure consists of introducing the contrast medium through a nylon-coated needle to the uterine fundus and assessing venous flow under fluoroscopy. Radiation exposure is < 1 mrad for the fluoroscopist, 2–3 mrads for the person administering the contrast medium, and 2–3 rads to the patient's uterine cavity. Evaluation is based on Beard's criteria, which assess the maximum diameter (<5 mm, 5–8 mm, > 8 mm), image fading time (0, 20, and 40 s), and the appearance of the pelvic congestion (normal, moderate, and extensive). Each item is given a score from 1 to 3 and if the final sum is ≥ 5, the patient is considered to meet the diagnostic criteria for pelvic congestion, with a 91% sensitivity and 89% specificity.[10]

PCS is often overdiagnosed in the differential diagnosis for CPP. On routine assessment, the etiology is unclear in one-third of all patients studied for CPP and, of these, 30% are believed to have PCS.[4] A study of 273 healthy kidney donors found venous insufficiency in 9.9% on venography; retrospectively, 59% of these patients reported CPP, suggesting that most patients with ovarian venous reflux had painful symptoms. In other studies, the combined use of the clinical signs such as ovarian points and post-coital pain showed a 94% sensitivity and 77% specificity when compared to venography for the diagnosis of PCS.[11] However, there are few studies evaluating the sensitivity and specificity of the clinical symptoms. Therefore, the main objective of this study was to assess the diagnostic performance (sensitivity and specificity) of clinical findings in women diagnosed with PCS coming to a Level III institution.

Materials and methods

The cross-sectional, descriptive, retrospective study of diagnostic tests based on a review of the clinical records of patients with chronic pelvic pain taken to transuterine pelvic venography at the Advanced Gynecologic Laparoscopy and Pelvic Pain Unit of Clinica Comfamiliar between August 2008 and December 2011. A total of 132 patients were included who met the following criteria: having completed the informed consent for the research, and being older than 18 years of age. Those with incomplete information in the clinical record were excluded. Patients were selected for a nonprobability sampling design.

The information was collected in a questionnaire that included social and demographic variables such as age and place of residence, as well as clinical variables like menarche, menstrual cycles, parity, cyclic pain, worsening pain when standing, metrorraghia, predysmenorrhea, dysmenorrhea, deep dyspareunia (during intercourse with deep penetration), superficial dyspareunia (at initial penetration), pain worsening at the end of the day, post-coital pain, speculoscopic appearance, trigger points (hypersensitive areas in the fascia surrounding skeletal muscle), ovarian points, vulvovestibulitis (burning, stinging irritation of the vaginal area), pinprick test (to localize pudendal nerve sensation), rectal and vaginal exam, and the result of the venography. The questionnaire was adjusted on the basis of a pilot test conducted with 10 patients. It is worth noting that although the information was collected from clinical records, three gynecologists trained in venography recorded the variables, as well as the procedure. The standardized venography procedure is described below.

In the operating room, all patients were placed in lithotomy position and were given general anesthesia; the speculum was then inserted and cervical forceps were used to clamp the anterior lip of the cervix; a nylon-coated needle (Cook Transcervical Pelvic Venography Set) was inserted through the endocervical canal up to the myometrium; contrast medium was injected into the myometrium under fluoroscopy, and pelvic radiographs were made at 0, 20, and 40 s (Figure 1).

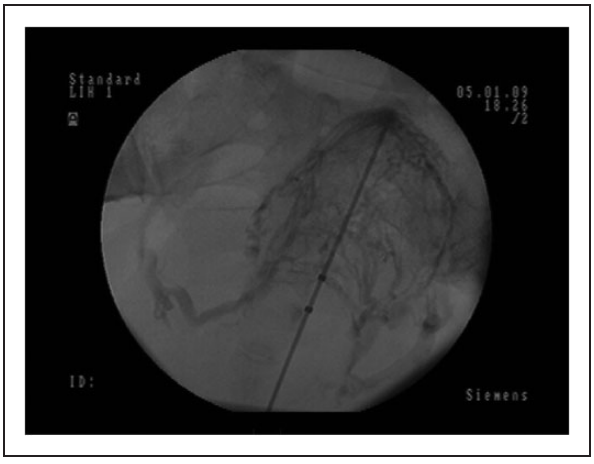

Figure 1. Negative venography with a nylon coated needle. Beard's criteria: 4 points: maximum diameter < 5 mm (1 point), image fading time 20 seconds (2 points) and normal ovarian plexus (1 point).

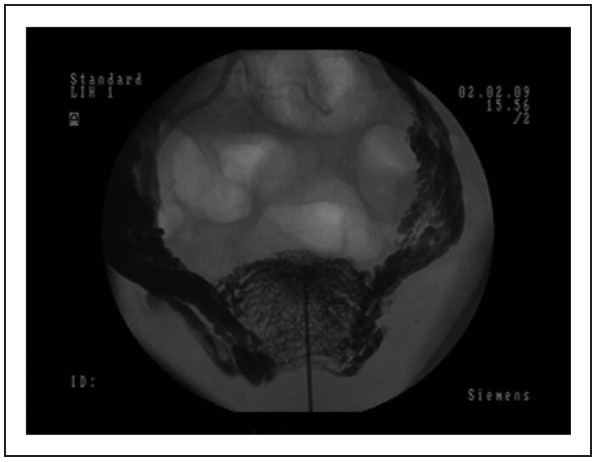

Figure 2. Positive venography with a nylon coated needle. Beard's criteria: 8 points: maximum diameter > 8 mm (3 points), image fading time 40 seconds (3 points) and moderate appearance of pelvic congestion (2 points).

Cases were considered positive for the diagnosis of PCS if they had a score equal to or greater than 5 according to Beard's criteria (Figure 2).

A database was built on a spread sheet for data analysis and the Stata 9 statistical software was used for descriptive statistics, including absolute and relative frequency analysis and diagnostic performance indicators such as sensitivity and specificity, with 95% confidence interval estimations, and all percentages were rounded. The Kolmorov–Smirnov statistical test was used for normality of the variables, which was in agreement with the test results, represented by mean and standard deviation or median and interquartile range.

Results

In terms of the general characteristics of the patients included in the study, mean age was 33.9 years (SD 6.4), 94.3% lived in urban areas, and mean age at menarche was 12.4 years (SD 1.2). As for the menstrual cycle regularity, 80.4% had regular cycles, 70% used some form of contraception, and 39.7% had undergone tubal sterilization. There was a history of some form of surgery in 53.4% of the patients.

Tables 1 and 2 show the frequency of signs and symptoms in the total sample.

Table 3 shows the sensitivity and specificity of the symptoms analyzed. Noteworthy are a sensitivity of 84% for dysmenorrhea and a specificity greater than 80% for the presence of leukorrhea and vaginal mass sensation, when compared with transuterine pelvic venography.

In terms of the clinical signs studied, the sensitivity of ovarian points is 87% and the sensitivity of vulvar varices is 100%, while specificities for findings of abdominal mass, abdominal trigger points, and positive pinprick test are 100%, 83%, and 84%, respectively, when compared with transuterine pelvic venography (Table 4).

Table 1. Frequency of symptoms in women complaining of chronic pelvic pain ($n = 103$).

Symptoms	% (*n*)
VAS (visual analogue scale) pain score greater than 7	97 (100)
Dysmenorrhea	82 (85)
Deep dyspareunia	76 (79)
Post-coital pain	75 (77)
Increased pain at the end of the day	73 (76)
Increased pain while standing	70 (73)
Predysmenorrhea	57 (59)
Nycturia	56 (58)
Superficial dyspareunia	44 (46)
Dysuria	44 (45)
Menorrhagia	25 (26)
Vaginal mass sensation	9 (9)
Leukorrhea	5 (5)

Table 2. Frequency of signs in women complaining of chronic pelvic pain ($n = 103$).

Signs	% (*n*)
Ovarian points	83 (85)
Vulvovestibulitis	51 (52)
Pinprick test	27 (28)
Trigger points	18 (18)
Abdominal mass	3 (3)

Discussion

This research found a sensitivity of 87% and a specificity of 37% for the finding of ovarian points, while sensitivity and specificity for post-coital pain were 79% and 42%, respectively; additionally, these findings were shown to have good sensitivity and low specificity, individually.

In a review of studies on the clinical variables and the presence of PCS, Metzger et al.[12] reported a sensitivity of 94% and a specificity of 77% for the finding of ovarian points; a sensitivity of 97% and a specificity of 64% for the finding of adnexal tenderness and post-coital pain; and a sensitivity of 94% and a specificity of 68% for ovarian points and migrating abdominal

Table 3. Sensitivity and specificity of symptoms in patients with chronic pelvic pain compared with transuterine pelvic venography.

Symptoms	Sensitivity	95% CI	Specificity	95% CI	PPV	NPV
Menorrhagia	26	17–37	79	54–94	85	19
Increased pain while standing	71	60–80	32	13–57	82	19
Predysmenorrhea	63	52–73	68	43–87	90	30
Dysmenorrhea	84	74–91	26	9–51	84	26
Deep dyspareunia	75	65–84	21	6–46	81	16
Superficial dyspareunia	47	36–58	68	43–87	87	22
Increased pain at the end of the day	72	61–81	21	6–46	80	14
Post-coital pain	79	68–87	42	20–67	86	31
Urinary urgency	40	29–51	47	25–71	77	15
Dysuria	43	32–54	50	26–74	80	16
Nycturia	54	43–65	33	13–59	79	13
Vaginal mass sensation	12	6–21	84	60–97	77	18
VAS (visual analogue scale) pain score greater than 7	29	19–40	74	49–91	83	19
Leukorrhea	7	2–15	100	81–100	100	19

PPV: positive predictive value; NPV: negative predictive value.

Table 4. Sensitivity and specificity of signs in women with chronic pelvic pain compared with transuterine pelvic venography.

Signs	Sensitivity	95% CI	Specificity	95% CI	PPV	NPV
Abdominal mass	4	1–10	100	82–100	100	19
Trigger points	18	11–28	83	59–96	83	18
Ovarian points	87	78–93	37	16–62	85	39
Vulvovestibulitis	49	38–60	42	20–67	79	16
Pinprick test	30	20–41	84	60–97	89	21
Vulvar varices	100	96–100	0	0–18	NA	NA

PPV: positive predictive value; NPV: negative predictive value.

pain. However, associations between clinical variables were not made in this study.

Chronic pelvic pain is associated with various physical, psychological, and social factors as well as multiple comorbidities that have a very significant negative effect on patient quality of life. In a large number of patients, CPP is associated with depression, chronic fatigue, and sexual dysfunction, and results in disability, physical handicap and other consequences associated with chronic pain.[13]

The origin of CPP is very often associated not only with gynecological conditions (endometriosis, PCS, inflammatory pelvic disease, ovarian remnant syndrome, or adhesions), but also with nongynecological diagnoses including myofascial pain disorders, irritable bowel syndrome, interstitial cystitis/painful bladder syndrome, or fibromyalgia.[13]

PCS causes chronic pelvic pain and many women have benefitted from the use of venography for diagnosing the disease.[14] It is estimated that the overall prevalence of the pelvic congestion varies. Angiography screening of candidates to renal transplant found left ovarian vein reflux and increased mean venous diameter in 10–38% of these women.[7] On the other hand, some authors have pointed out that PCS has been overdiagnosed in the differential diagnosis of CPP (endometriosis, adenomyosis, urologic, and gastrointestinal disorders)[1,3] and have reported that one-third of the patients studied for CPP do not have a clear etiology and CPP is attributed to PCS.[1]

Clinical findings in women with PCS have not been well characterized and there is a wide variation. To date, it has been proposed that PCS is associated with childbearing age,[15] something that can also be found in

this study, considering that the vast majority of patients were under 50 years of age (98%).

The clinical variability of this syndrome has resulted in the use of several names in accordance with the relevant event at each point in the history. It has been proposed that the cardinal pathogenic event is gonadal venous system failure leading to insufficiency. This translates into global, ascending pelvic venous plexus dilatation at different levels, from the superior plexus of the uterine broad ligament (mesovarium, mesosalpynx) and the uterine venous plexus.[16] This explains the range of clinical manifestations such as the presence of dysmenorrhea, and the finding of ovarian points and vulvar varices, which are confirmed in this study on the basis of the high sensitivity of these clinical findings.[11,17] The presence of dilated pelvic veins also depends on the mechanical factors (which explains vulvar varices, increased pain at the end of the day or after standing for a long time),[10] as well as on the hormonal factors,[11] considering that the diameter of the blood vessels changes with the stage in the menstrual cycle, also explaining dysmenorrhea.

The causes of chronic pelvic pain are not well known and the final diagnosis of the etiology is challenging because pain is rarely associated with a single underlying disorder or contributing factor, considering that high specificities were found in relation to vaginal mass sensation, leukorrhea, positive pinprick test, and abdominal mass. This does not mean that PCS is ruled out if these findings are present, because this syndrome is part of multiple pain-eliciting syndromes. For example, in studies on the etiology of chronic pelvic pain, the concomitant findings of endometriosis and painful bladder syndrome were present in 70% of cases,[18] and in a systematic review by Tirlapur et al.,[19] the authors reported coexistence of these two diseases in 48% of patients with chronic pelvic pain. Added to this, there is a visceral–visceral and visceral–somatic convergence mechanism[20] that may explain the presence of PCS and deep dyspareunia, predysmenorrhea, and dysmenorrhea in patients with endometriosis and PCS, as well as the findings of positive pinprick test and vaginal mass sensation that guide to the presence of pudendal neuralgia as an additional trigger of pain.[21]

This study recognizes the classical weakness of retrospective studies regarding the source of information; however, the procedure as well as data entry in the clinical record were performed in a standardized fashion as part of the daily routine of care for these patients.

This research may be highlighted as the first that evaluates the diagnostic performance of the clinical findings associated with PCS in a sample of the Colombian population. These findings may be used in the future to create a clinical score for the diagnosis of this condition, because until now, what we know as PCS is the result of work conducted in populations other than the one used in this study. Moreover, no correlation has been made so far between the clinical signs and symptoms and chronic pelvic pain secondary to the PCS.

Declaration of Conflicting Interests

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