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Pelvic Congestion Syndrome: Etiology, Symptoms, and Epidemiology of a Chronic Pelvic Pain Disorder

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A B S T R A C T

Pelvic Congestion Syndrome (PCS) is a chronic condition primarily affecting premenopausal, multiparous women, characterized by persistent pelvic pain and discomfort. This syndrome arises from venous insufficiency in the pelvic region, often due to incompetency in the internal iliac or ovarian veins, leading to pelvic venous dilation and varicose veins. Although the exact cause remains unclear, hormonal influences, venous valve insufficiency, and venous obstruction are believed to contribute to the development of PCS. In affected individuals, blood stasis and vein dilation can lead to pain through chemical mediators released during venous congestion. Epidemiological data indicate that around 30% of women presenting with chronic pelvic pain may have PCS, making it a significant contributor to chronic pelvic discomfort. This article reviews the etiology, pathophysiology, and epidemiology of PCS, offering insights into its diagnosis and potential treatment approaches.

Keywords: *Pelvic Congestion Syndrome, chronic pelvic pain, venous insufficiency, ovarian varices, pelvic veins, premenopausal women*

Introduction

Chronic pelvic discomfort is a symptom of a disorder called pelvic congestion syndrome. It is believed to be brought on by issues with the pelvic veins. The lowest portion of your abdomen is this. The blood vessels that return blood to the heart are called veins. Veins in the lower abdomen may become dysfunctional in certain individuals. The veins may begin to fill with blood. Your pelvic veins may grow and change shape, resulting in varicose veins. Pelvic congestion syndrome symptoms, including pain, may result from this. The majority of those affected are of childbearing age. Those who have given birth to multiple children may be more likely to experience it.

Etiology

The internal iliac vein, the ovarian vein, or both may be incompetent, resulting in pelvic venous insufficiency. It frequently serves as the root cause of pelvic congestion syndrome. Ovarian varices affect over 10% of women. About 60% of these 10% suffer from pelvic congestion syndrome. [2] It's unclear exactly what causes pelvic congestion syndrome. It probably depends on a number of variables. Hormones may be the cause of pelvic vein congestion insufficiency of the valve, and venous obstruction.

One potential source of pain in PCS is the release of chemicals that produce pain as a result of increased venous dilatation and stasis.

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The study of epidemiology Pelvic congestion syndrome primarily affects premenopausal multiparous women. [4] Menopausal women have not been known to experience the syndrome. 51. Nearly 30% of patients with presenting complaints of chronic pelvic pain have the illness.[6]

Pathophysiology

The aberrant dilatation of the interconnected venous channels of the ovarian and internal iliac veins is frequently implicated in pelvic vein insufficiency. On both sides, the ovarian plexus empties into the ovarian veins. The internal iliac veins receive the drainage from the hemorrhoidal, utero-ovarian, sacral, and vesicular venous plexuses. Both the ovarian and internal iliac vein systems pass via the wide ligament. [1]. The inferior vena cava and internal iliac veins may be incompetent.

The ovarian veins are where the majority of pelvic varices are found. Furthermore, pelvic congestion syndrome affects roughly 60% of individuals.[7] The internal pudendal and broad ligament parametrial branches are incompetent in most cases of pelvic congestion syndrome. The incapacity of the branches of the circumflex femoral and obturator veins is frequently linked to pelvic venous reflux into the lower limb or vulvar varicosities. [8] Either the venous valves are absent or ineffective, which results in primary vein insufficiency. It has been observed that 6% of patients on the right side and 13% to 15% on the left side of these patients had congenital absence of the ovarian valves. 35% to 46% of women on the right and 41% to 43% of women on the left have incompetent valves. The 50% increase in pelvic vein capacity brought on by pregnancy-related physiological changes may be the cause of multiparous women's propensity to develop PCS. Retrograde blood flow and valve incompetence may follow from this. These vascular alterations may continue for up to six months following delivery. |9. External compression of the vein, which results in venous outflow obstruction, is frequently the cause of secondary pelvic vein incompetence. The nutcracker phenomenon, commonly referred to as left renal vein entrapment syndrome, is one of the causes of external compression. The left renal vein is compressed between the abdominal aorta and the superior mesenteric artery, causing this condition.

Similar outcomes may also arise from May-Thurner syndrome, where the right internal iliac artery compresses the left common iliac vein. 10|11 Pelvic venous congestion may result from a regional overload in the venous channels. Cirrhosis, tumor thrombosis in the inferior vena cava, left renal vein thrombosis (with renal cell carcinoma), congenital abnormalities of arteriovenous and venous channels, and retroaortic left renal vein are some possible causes of this regional overload. Complete symptom relief during menopause suggests that hormones have a role in pelvic congestion syndrome. Since estrogen is a venous dilator, it can cause the venous dilatation linked to PCS pathogenesis. [5].

Symptoms

Frequently, a woman's symptoms don't start until she gets pregnant, and they persist after the pregnancy. Pelvic pain is the primary symptom of PCS. Particularly for women who sit or stand all day, the discomfort usually gets worse throughout the day until going away after a restful night's sleep. Find out more about pain in the pelvis. Additionally, the pain may get stronger during or after sexual activity, or around menstruation. Following specific physical activity, like riding a bike or a horse,
Evaluation Although it is not required to reach the final diagnosis, the presence of distinctive pelvic venous alterations on imaging supports the diagnosis. Asymptomatic women frequently have dilated ovarian veins with incompetent valves. [4] Patients with PCS who are scheduled for an intervention need to have their pelvic venous reflux evaluated by ultrasonography, retrograde internal iliac or ovarian venography, computed tomography (CT), or magnetic resonance (MR) imaging. [1].

Ultrasound

Pelvic ultrasonography is the first imaging test used to diagnose pelvic congestion syndrome. In order to rule out pelvic masses or uterine issues as the root cause of pelvic pain, ultrasound is helpful. The pelvic anatomy, ovarian alterations, uterine enlargement, and dilated ovarian and uterine veins can all be assessed using color-Doppler and standard B-mode ultrasonography. [16] Ultrasonography can show retrograde blood flow with a decrease in blood flow velocity and an increase in the size of the left ovarian vein. One can observe enlarged, convoluted pelvic venous pathways. Valsalva's technique can be used to identify the pelvic varicose veins' incompetent valves. During such motions, these varicoceles will display a changing duplex waveform. Patients with pelvic congestion syndrome also have polycystic ovarian abnormalities.

Computed Tomography and Magnetic Resonance

Computed tomography and magnetic resonance imaging make it simple to see the anatomical intricacies of the pelvic vasculature and the tissue of the pelvic cavity. CT is not advised for premenopausal women since it uses radiation [7]. A useful technique for identifying pelvic vascular varices is magnetic resonance venography. It is a low-risk noninvasive imaging method. However, because the patient is supine during the examination, the imaging modality's specificity for venous diseases is limited [8] Phase-contrast velocity mapping is an MRI-based method that can be used to determine the direction and velocity of flow in various vascular channels. Pelvic veins can be assessed using this method [1-2].

Venography

Venography from ovarian and iliac catheters is the gold standard for identifying pelvic obstruction of the vasculature. Catheterization of ovarian veins is accomplished by entering through the femoral and percutaneous jugular channels. During Valsalva, a venogram is a superior way to measure the distension of the venous channels. Incompetent pelvic veins (diameter greater than 5–10 mm) and flow congestion in the ovarian, pelvic, vulvovaginal, and thigh vein venous channels are venographic diagnostic findings of PCS. It is also possible to observe ovarian vein venous reflux.

Laparoscopy

One of the main reasons for gynecologic diagnostic laparoscopies is persistent pelvic pain. Some statistics claim that chronic pelvic pain accounts for over 40% of these laparoscopic surgeries. [20]. Between 35 and 83 percent of women with chronic pelvic discomfort had abnormal findings found during laparoscopies. Pelvic congestion is also found in 20% of these instances [4].

Treatment

The initial line of treatment for PCS should be medical management. This is because, in contrast to intrusive operations, medicinal management has less complications. Progestins, phlebotonics, danazol, combined oral contraceptives, gonadotropin-releasing hormone agonists, and non-steroidal anti-inflammatory medications are some of the therapy alternatives that have demonstrated efficacious management of PCS pain. Aoserelin, medroxyprogesterone acetate, and etonodestrel implants have also proven effective in reducing PCS discomfort. [3] When medroxyprogesterone is administered in conjunction with psychotherapy, better pain alleviation is seen. [3]. Compared to medroxyprogesterone acetate, goserelin, a GnRH agonist, is more effective at reducing pain; however, because it is a GnRH agonist, it cannot be used for more than a year. [3]. Positive outcomes may arise from the ligation of incompetent ovarian veins. The symptoms are resolved in over 75% of women once the incompetent ovarian or pelvic arteries are tied up. Gynecologists have treated pelvic congestion syndrome by bilateral salpingo-oophorectomy and hysterectomy, but the outcomes have not been good. [10] Endovascular techniques that employ a minimally invasive technique can also be used to ablate defective veins. These operations can be carried out in an outpatient setting, which results in fewer problems and a relatively speedy recovery [4]. Endothelial damage in the incompetent vessels can be caused by a variety of substances, such as glue, foam, platinum embolization coils, or liquid sclerosants [5]

Differential diagnosis

Pelvic congestion syndrome has a long variety of differential diagnoses. It include gastrointestinal and urinary tract ailments, musculoskeletal disorders, neurological disorders, gynecological issues, and mental health disorders. Chronic pelvic pain is frequently caused by pelvic inflammatory disease, interstitial cystitis, endometriosis, pelvic neuralgia, irritable bowel syndrome, myofascial pain, and pelvic floor myalgia. Even with laparoscopic and diagnostic radiological testing, it might be challenging to accurately diagnose the underlying cause of chronic pelvic pain.

Prognosis

Nearly 68.2% to 100% of women with pelvic congestion syndrome indicate that their symptoms have resolved after receiving treatment. However, between 6% and 31.8% of patients have reported no discernible alleviation of pelvic congestion syndrome discomfort following pelvic embolization [6].

Complication

Recurrent pelvic pain (20%) and residual pelvic pain (33%), respectively, are more common after surgical therapies for pelvic congestion syndrome. Moreover, prolonged hospital stays and aesthetic harm are frequently associated with surgical procedures [7]. Another significant side effect of ovarian vein ligation and oophorectomy is the loss of gonadal function, which need hormone replacement [8].

Deterrence and Patient Education

Approximately 2.1% to 24% of women in the 18–50 age range have pelvic congestion syndrome. This demonstrates how crucial it is to educate PCS patients. They ought to receive instruction on adhering to their treatment plan and noting any correlation between their symptoms and menstruation. Hormonal replacement is frequently required after bilateral oophorectomy. Patients should be informed about these complications as well [10].

Enhancing Healthcare Team Outcomes

Approximately 10% to 20% of gynecologic visits are related to chronic pelvic pain. Almost 40% of these are sent to experts for assessment. It takes a high level of clinical suspicion on the part of the clinician to diagnose pelvic congestion syndrome. Medical or surgical management may be considered required following diagnosis. Additionally taken into consideration is the radiological method of embolization. Thus, maintaining positive results in the treatment of patients with pelvic congestion syndrome requires the coordination of an interprofessional team comprising primary doctors, gynecologists, and interventional radiologists. |11].

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