

Original Article:

Pelvic Congestion Syndrome: current approach and future diagnostic perspectives

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Abstract

Objective: The aim of this review is to present the ways of approaching Pelvic Congestion Syndrome (PCS) and to emphasize on the current trends and problems of diagnosis. **Background:** PCS represents a cause of chronic pelvic pain, affecting mainly women and suspected frequently during pregnancies. It is underdiagnosed partly because patients do not tend to investigate their symptomatology, but also because of the invasive character of the golden standard procedure for diagnosis, venography. Treatment includes interventional, medical and surgical alternatives. **Conclusions:** Currently, ultrasound parameters are being assessed in order to replace venography, as it is usually performed in most patients in gynecology and most important it is non-invasive. Transvaginal approach, the use of Doppler mode and Valsalva maneuver, vein diameters can help orientate the diagnosis, pointing that US should have the potential to be used both as a screening test and diagnostic procedure in the future.

Keywords: pelvic congestion syndrome; ultrasound diagnosis; chronic pelvic pain

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Introduction

Pelvic Congestion Syndrome (PCS) is a frequent cause of chronic pelvic pain (CPP), affecting mainly women at childbearing ages, disappearing after the onset of menopause. CPP is defined as pain occurring for more than 6 months, constant or intermittent, localized in the pelvic or abdominal areas, not related to the menstrual cycle, but can exacerbate during premenstrual period, postcoital or after long periods of time standing up.^{1,2}

PCS is underdiagnosed as few women present to the gynecologist for CPP although it represents the cause of 20% of CPP. Its etiology is poorly understood as it considered being multifactorial, but pelvic vein insufficiency plays an important role, as the name suggests.^{1,2}

Diagnosis is achieved with venography or sometimes less invasive procedures, such as ultrasound (US), and current treatment is represented mainly by embolization with a high success rate of 98-100%.³ However there is still much improvement

to be made in terms of diagnostic procedures in order to facilitate the compliancy of the patient and the screening process. Less and less invasive techniques are used and different parameters are researched to assess better alternatives with the same sensitivity and specificity.

In this short review we present the current options used for diagnosis and treatment, emphasizing the trend for non-invasive techniques.

Materials and Methods

Data Sources and Study Selection

We performed a PubMed search using the following terms: “pelvic congestion syndrome”, “pelvic congestion syndrome diagnosis”, “pelvic varices diagnosis” with the following filters : Clinical Study, Clinical Trial, Comparative Study, Controlled Clinical Trial, , Multicenter Study, Randomized Controlled Trial. Articles ranging from 1970 till 2019 were found but only ones published in English were taken into consideration. A possible limitation of the search process might include using only one website

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(PubMed) for article selection.

Inclusion and exclusion criteria

All the articles found were manually reviewed and selected based on the presence of the diagnosis criteria for PCS and pelvic vein insufficiency that leads to PCS. A total of 10 articles were chosen to be presented.

Clinical findings

Main complains include CPP, but also dyspareunia, dysmenorrhea and possible bladder irritability due to varicosities in the proximity of the bladder.^{1,4}

Physical examination can detect varicose veins in the following regions: vulvovaginal, suprapubic, lower limbs.^{1,4,5} Varicose veins outside the pelvic area might be due to the formation of a system of collaterals but this has not been yet investigated thoroughly.⁵ Differential diagnosis is made with diseases of the urinary or gastrointestinal tract, psychiatric disorders and neurologic pathology.²

Risk Factors

No evident cause has been identified in the PCS, but multiple factors have been observed. Only premenopausal women experience this syndrome proving a direct link with the endocrine system. As estrogen levels grow the smooth muscle relaxes under the influence of nitric oxide and leads to vessel wall distension. Multiparity is considered a risk factor of PCS as in multiple cases symptoms appear during or after the first pregnancy and can worsen with ulterior ones.^{2,4}

Absence of ovarian vein valves also contributes to development of varicosities as well as venous overload which can occur in some pathologies such as portal hypertension with or without cirrhosis, inferior vena cava thrombosis, nutcracker syndrome, arteriovenous malformations or tumors that exert a mass effect on the abdominal and pelvic venous system.^{2,4}

Ethical clearance: Ethics approval was not required for this systematic review. Inform consent was not required.

Diagnosis

Ultrasound (US), transabdominal or transvaginal, is usually the first performed investigation as it is non-invasive and can rapidly orientate the

diagnosis. Vascular changes representative for PCS include: dilatations of ovarian/uterus/parametrium veins with slower or reversed caudal flow, dilated and tortuous arcuate veins in the myometrium, polycystic appearance of ovaries. Normal diameter of the ovarian veins is less than 4 mm and values above 5 mm imply presence of varicosities. Valsalva maneuver is performed during Doppler mode to assess the severity of the reversed blood flow.^{3,4}

Following ultrasound, other options for diagnosis include CT, MRI and venography or in the past, laparoscopy. A summarization of the imagistic findings is presented in table 1.

Table 1. Summarization of pathological findings in context of PCS in various methods of imaging.^{4,7,11}

Type of Investigation	Findings
Ultrasound	Pelvic varicosities, dilatations > 4mm
CT with contrast enhancement	Dilated veins are isodense with normal veins
MRI	
T1	Hypointense
T2	Hyper/Hipo/Iso-intense
Reconstruction	Possible cause of dilation
Venography	Anatomy of the varicosities

CT and MRI can identify dilated veins after contrast enhancement. Because PCS is a pathology that primarily affects women at childbearing age it would be a more comfortable option to use MRI rather than CT to diminish the radiations over the reproductive system. On CT the dilated veins are distinguished from other possible masses as they have the same enhancement as normal veins. On MRI finds vary upon the sequence, T1, T2, contrast, reconstruction.⁴

The gold standard investigation for PCS remains venography despite being invasive. It is the best method for assessing the exact site of dilatations, collaterals, retrograde reflux and by injecting the contract medium prior to reflux in the contralateral iliac vein it is possible to calculate the amount of sclerosant agents and gelfoam required for embolization.⁴

Diagnostic laparoscopy used to be more frequently used in the past, but it has been replaced by venography, CT, MRI. Its nature and invasive

character is enough to not make the patient compliant and opt for something with fewer risks.

Currently, accuracy of US is being studied in order to replace venography which would be more comforting for the patient. As a screening test US proves to be efficient when executed right. Transvaginal approach in both supine and semi-standing positions together with the Doppler mode and Valsava maneuver can detect venous insufficiency. Also criteria for US diagnosis of PCS are under research as for example, the diameter of the ovarian vein is no longer considered a good predictor of the existence of reflux and should not be used alone to recommend treatment for PCS.^{6, 7} Further research is needed to continue assessing US parameters for a correct diagnosis of PCS and ovarian vein insufficiency.

Table 2 shows more information about the procedures used for PCS diagnosis in several studies, some which focused on describing the pros and cons of different methods. It can be noted a trend towards less invasive techniques, perhaps also as a consequence of the need make the patient compliant and accept investigations in order to get the right treatment.

Table 2. Different Approaches to diagnosis of PCS or pelvic vein insufficiency

Study	Number of patients	Techniques
Guirola et al. (2018)	100	Transabdominal and Transvaginal US
Gibson et al. (2017)	72	US
Hansrani et al. (2016)	50	Transvaginal US
Gavrilov et al. (2015)	74	US, venography, CT
Don Santos et al. (2015)	19	Transvaginal US
Leiber et al. (2014)	141	MRI, venography
Menses et al. (2013)	10	Venography
Shokeir et al. (2009)	70	US, venography, diagnostic laparoscopy
Min et al. (2003)	164	Venography, diagnostic laparoscopy
Soysal et al. (2001)	148	Transabdominal and Transvaginal US, venography, diagnostic laparoscopy

Also having a procedure that can be performed by the gynecologist with ease such as US has its benefits as it could lead potentially to a higher rate of diagnosis

of PCS as a part of the regular visits women have especially during pregnancies.

CT and MRI are not as often used as they have higher costs, CT –radiation, are still not able to confirm the diagnosis 100% because of the lack of dynamic parameters.

Treatment options

A large variety of treatments are proposed for PCS, medical, surgical and endovascular. Medical alternatives are centered on estrogen suppression agents such as medroxyprogesterone acetate (MPA), gosereline (synthetic variant of GnRH), contraceptive implants and more recently studies, venous compression methods.⁸

Gosereline has proved to be more efficient in relieving pain, anxiety and reducing pelvic venography score than MPA, but both having significant results overall. What is to be kept in mind are the side effects of this drugs and mainly the effect over the fertile functions for women who want to get pregnant.^{8,9}

As for implants, Shokier et al have studied the possibility of treating PCS with a progestogen implant for 1 year. Results showed amelioration of symptoms compared to giving no treatment which could be a solution for female patients who also look for contraception. Advantages of this therapy over GnRH analogues and (MPA) include lower costs, less side effects and faster gaining of the ovarian functions after ending the treatment.¹⁰

Another alternative for a conservative treatment would be venous compression. Gavrilov et al. have studied its effectiveness on three different groups of patients using compression shorts and stockings for 10 days. Results showed a decrease in chronic pelvic pain after wearing the compressive shorts, but no significant change for the compressive stockings. However if the patient presents vulvar varicosities stockings might elicit discomfort.¹¹

Surgical treatment used to be an option for long term results, but the effectiveness of the endovascular approaches has made it a more likeable alternative. Hysterectomy and bilateral salpingo-oophorectomy, ovarian veins ligation or excision showed symptomatology improvement.^{2,12} However such approaches have difficult physical and psychological implications for the patient especially for fertile women who wish to conceive. Also the hormonal

substitutive treatment has its downsides making it hard for the patient to be compliant to such techniques.

Interventional treatment is represented by embolization and sclerotherapy, alone or combined. In most cases embolization uses fiber platinum coils (FPC).³

In study of 202 patients, embolization with only FPC proved to have a technical success rate of 100%, reduce symptoms in 93.35% and completely abolish them in 60 patients. A small number of complications were registered such as groin hematoma (6 cases) and coil migration (4 cases) but they were resolved without any further problems.¹³

However there is another alternative to FPC, vascular plugs (VP). A study from 2018 by Guirola et al. compared the efficacies of both devices regarding improvement of symptomatology, especially CPP, complications, duration of the procedure and radiation doses. Both methods showed significant pain relief, but VP proved to need less time for the procedure and consequently lower radiation doses. This could be of great value in this pathology as embolization implies radiation of pelvic zone and genital organs often in fertile women. As for complications in both groups migration was detected but with no significant statistical difference.³

The combination of sclerosant agents (sodium morrhuate/ gelfoam slurry) and coils has also been studied on 97 female patients with clinical improvement (83% of cases) and no severe adverse reactions at the 45months follow-up.¹⁴

This demonstrates good results of the endovascular technique which is now the recommended treatment for 2b level of evidence by the Society of Vascular Surgery and the American Venous Forum.¹⁵

Conclusion

PCS is a diagnosis to be kept in mind in case of CPP especially in pregnant women. Because of numerous treatment options, work up towards the diagnosis should be encouraged in order to maximize the quality of life for the patient and shall not wait until the onset of menopause for the symptomatology to diminish.

US might become the future gold standard procedure for PCS diagnosis, which could increase the number of diagnosed cases. Most patients would agree to undergo such a procedure and even have regular check-ups with their gynecologist while sexually active, increasing the possible rate of diagnosis.

Specific US criteria should be established and guidelines should be integrated as part of the regular visits at the gynecologist women have, especially during pregnancies.

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Authors's contribution:

Data gathering and idea owner of this study: CA Zah

Study design: CA Zah, P Grama

Data gathering: CA Zah, P Grama

Writing and submitting manuscript: CA Zah, P Grama

Editing and approval of final draft: CA Zah, P Grama

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