Original article

Chronic pelvic pain associated with pelvic vein incompetence

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Abstract: Introduction: Chronic pelvic pain (CPP) is a spectrum of symptoms including pain, tension in the lower abdomen, dyspareunia, dyskinesia, dysuria or dysmenorrhea. The conditions responsible for CPP are various but in more than 60% cases the diagnosis cannot be established. Ultrasound is a useful tool in the evaluation of those patients. *Material and method:* We retrospectively evaluated the ultrasound scans and physical examination of the patients who presented in our clinic for pelvic pain between Jan 2016-Jan 2018. We retrieved only the patients who reported at least one of the symptoms compatible with CPP and reviewed the files. A chart with relevant characteristics -age, parity, main complaints, transvaginal ultrasound was completed. We searched for abnormal pelvic vascular patterns suggestive for incontinent pelvic veins. *Results:* In a two years period 2437 women asked for genital examination in "Bucur" Obstetrics and Gynecology Clinic. For 326 women abdominal pain was the main complaint but only 128 met the criteria for CPP. In 31 of them ultrasound transvaginal scan revealed abnormal vascular patterns of the pelvic veins (enlarged, tortuous vessels) suggestive for congestion and incontinent veins. *Conclusions:* Congestion of the pelvic veins can be responsible for about 30% of the CPP especially in multiparous women. Ultrasound using Doppler is useful in order to establish incontinence of the pelvic veins.

Keywords: Chronic pelvic pain; Doppler ultrasound; Pelvic congestion syndrome; Pelvic veins diameter; Pelvic veins incompetence.

INTRODUCTION

The underlining causes of chronic pelvic pain in women suffer great variety, with most of the pathology being easily diagnosed and treatable (e.g.: painful bladder syndrome, irritable bowel syndrome, adhesions, adenomyosis, endometriosis, pelvic inflammatory disease etc.). The concern for gynecologists is the idiopathic chronic pelvic pain in women, because of the lack of diagnosis criteria and accessibility to imaging techniques worldwide. The definition of the symptom, represented by chronic pelvic pain, refers to lower abdominal or pelvic pain, for more than 6 months, perceived by women in a continuously or intermittent manner with no relation to menstrual cycles, intercourse or pregnancy[1]. There are no guidelines referring to the definition of chronic pelvic pain[2], but the constant characteristic that appears in every given definition worldwide is the duration over 6 months of pelvic pain. The incidence of chronic pelvic pain is estimated around 24%[3,4,5], but with the lack of accepted definition or diagnosis criteria, incidence may vary among countries. Beside dull persisting pelvic pain, dysuria, dyspareunia, dysmenorrhea, dyskinesia may be associated[6], implying the need for a differential diagnosis, and treatment. Because of its impact not only upon women's functionality but psychological effect, many patients experiencing anxiety or depression[7], therapeutic objectives have a tendency towards symptomatic relief, for a long period of time.

The pathophysiology behind the appearance of incompetent pelvic veins is similar to that of peripheral vein insufficiency[8], where valvular leaflet's function declines, making retrograde blood flow a cause for the extension in venous diameter. Furthermore, the gravid uterus and the circulatory overdistention that appears in pregnancy contribute to the vicious circle responsible for pelvic vein incompetence[2].

Patient examination should include a pain history (precipitating and alienating factors, response to prior treatment, sexual activity, urination, defecation), represented through a variety of scoring systems, with the most commonly used in literature being the Visual Analog Scale. Physical pelvic examination is based on external examination of the genitals (looking for inflammatory or dermatological conditions, vulvar malignancies, varicose veins of the perineum or lower limbs), speculum examination and unidigital or bimanual examination, in search for pelvic tenderness in the right and left pelvic floor, cul-de-sac, bladder base, uterus and adnexa[9].

Laboratory testing has limited value and should be used as a differential diagnosis. Pregnancy should be excluded.

This study offers our clinic's perspective upon the association between chronic pelvic pain and pelvic vein incompetence, the objective being: finding statistically significant correlations between pelvic congestion syndrome and variables like: parity, uterus position, associated pathology etc.

MATERIAL AND METHODS

Study design

We conducted an observational retrospective study, which took place in our clinic: Saint John Hospital-"Bucur" Maternity, in Bucharest, in a period of 2 years from Jan 2016 to Jan 2018. The objectives were to find among women searching for medical care, those complaining of pelvic pain, and to identify the association of chronic pain and incompetent pelvic veins, as well as finding statistically significant correlations with several variables, such as: age, associated pathology (ascites, abdominal surgery), uterus position, parity.

Selection of patients

We review the files of 2437 patients who underwent genital examination, in our clinic, during two years period of time. 326 of them searched for medical care, complaining of pelvic pain. The criterions used for defining chronic pelvic pain were: pain in the lower abdomen, which lasted for more than 6 month, with no identifiable etiology until the examination. We did not take under consideration, for the inclusion criteria, variables like: age, parity, associated pathology or surgery. Instead, based on these particular items, statistically significant association with chronic pelvic pain and pelvic vein diameters were searched and made. 128 patients met the criteria for chronic pelvic pain, all of which underwent ultrasonography for identification and diagnosis of gynecologic pathology.

Ultrasonography examination was conducted in each case. With the patient supine, in a gynecological position, a

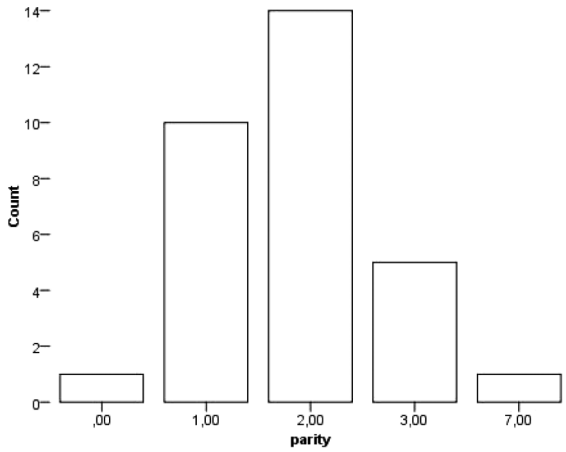

Figure 1. – Parity prevalence chart.

transvaginal transducer in Mode B was used to identify pelvic masses, uterine fibroids or other abnormalities. Color Doppler mode with low velocity scales was used to assess the pelvic veins and its diameters, and also the presence or absence of retrograde venous flow.

Statistical analysis

A data base was obtained, consisting of the patients who had abnormal patterns of the pelvic veins on ultrasound examination, and variables like: age, smoking character, parity, associated pathologies, history of surgery, presence of ascites, uterine position, and pelvic vein diameters. The presence or absence of venous reflux when the Valsalva maneuver was performed was noted while assessing the vein diameter.

The statistical analysis was performed with specific using SPSS 20.0.Crosstabulation, T student test, Chi square test were applied for numeric variable. We analysed the correlation among parameters using bivariate tests such as Pearson or Spearman correlations. P value was considered statistically significant for $p<0.05$ or 0.01 in selected situations.

RESULTS

Thirty one women were found to have abnormal patterns of the pelvic vein on ultrasonography examination, when presented with chronic pelvic pain in the emergency room

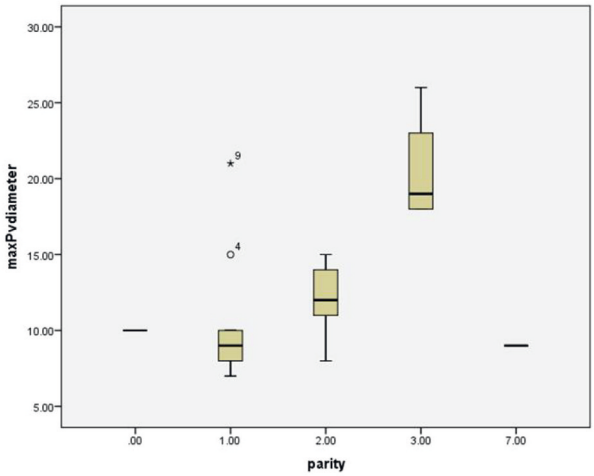

Figure 2. – Correlation between parity and maximum pelvic vein diameter.

Correlations

			ascites	uterineposition
Spearman's rho	ascites	Correlation Coefficient	1.000	-.485**
		Sig. (1-tailed)	.	.003
		N	31	31
	uterineposition	Correlation Coefficient	-.485**	1.000
		Sig. (1-tailed)	.003	.
		N	31	31

**. Correlation is significant at the 0.01 level (1-tailed).

Figure 3. – Correlation between uterine position and ascites.

or as outpatients, from January 2016 to January 2018. We considered being abnormal, a diameter of the pelvic veins (ovarian vein, internal iliac veins) that exceeded 6 mm. In 71% of the cases, the diameter even exceeded 10 mm. The biggest diameter found was 26 mm, and was the case of a 51 years old, tertiparous woman.

Mean age was 39 years old, the frequency of the smokers was almost equal to that of the non-smokers (46,5% vs 49,6%).

The majority did not have an associated gynecological pathology (54,8%), but where identifiable, the majority of the patients had uterine fibroids (25,8%), followed by: ovarian cyst, uterine polyp, istmocel (6,5%). Of those found to have fibroids, 87,5% also had a maximum pelvic vein diameter over 10 mm.

In terms of parity, most of the women examined for chronic pelvic pain were multiparous, fourteen of thirty one being tertiparous with ages between 37 and 52 years old (Figure 1).

Increased parity was correlated with greater pelvic vein diameters. All of the secundiparous patients had diameters of the pelvic veins greater than 8 mm, while all of the tertiparous patients had pelvic vein diameters greater than 10 mm (Figure 2).

Ascites was found in 41,9% patients, 69,2% of which had a pelvic vein diameter greater than 10 mm. Also we noted that the prevalence of ascites was bigger in women with retroverted uterus than in those with anteverted position (Figure 3, Figure 4).

Valsalva maneuver was used in all cases while performing Doppler ultrasonography, to evaluate the presence or absence of a retrograde venous flow. In ten of all women included in this study, a retrograde venous flow was ob-

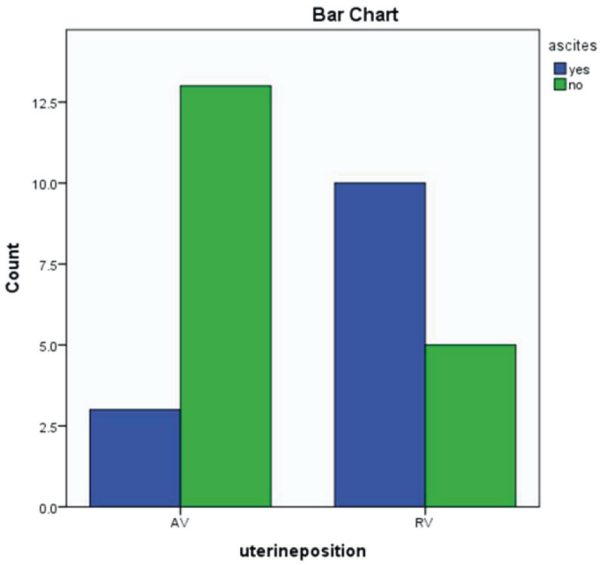

Figure 4. – Association between uterine position and ascites.

Correlations

uterineposition			parity	maxPvdiameter
AV	parity	Pearson Correlation	1	.150
		Sig. (2-tailed)		.579
		N	16	16
	maxPvdiameter	Pearson Correlation	.150	1
		Sig. (2-tailed)	.579	
		N	16	16
RV	parity	Pearson Correlation	1	.648**
		Sig. (2-tailed)		.009
		N	15	15
	maxPvdiameter	Pearson Correlation	.648**	1
		Sig. (2-tailed)	.009	
		N	15	15

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 5. – Correlation between uterus position, parity and pelvic vein diameter.

served. 80% of these had diameters of the pelvic veins greater than 10 mm.

Uterus position was assessed also by ultrasonography, resulting 48,4% patients having retroverted uterus and 51,6% anteverted uterus. We calculated the mean pelvic vein diameter for each group and concluded that retroverted uterus was associated with greater pelvic vein diameter (13,46 mm vs 12,12 mm in anteverted uterus).

Parity and retroverted uterus was the association of factors that correlated with greater pelvic vein diameters (Figure 5, Figure 6).

DISCUSSION

Chronic pelvic pain has a profound mark on women's life, affecting functionality, economical status, psychological status, overall the quality of life. Therapeutic management is based on symptom relief, and improvement of functionality.

Ultrasonography, either transabdominal or transvaginal approach, represents the first imagistic step in evaluating women with chronic pelvic pain, having 96% sensitivity, 100% specificity, with positive and negative predictive value of 100% and 94%, respectively[3]. It can diagnose pelvic masses, uterine fibroids, endometriosis etc. The most common findings: enlarged pelvic vein diameters,

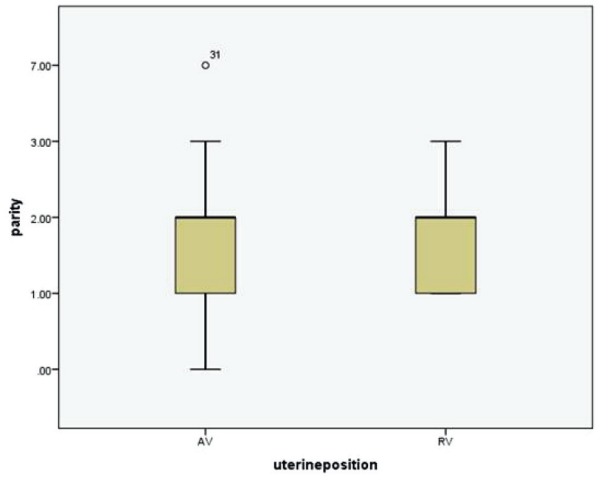

Figure 6. – Uterus position and parity chart.

retrograde venous blood flow (pelvic vein incompetence)[10], when associated with chronic pelvic pain, define the term "pelvic congestion syndrome". Recent literature reviews consider pelvic vein incompetence as the etiopathogeni for chronic pelvic pain, but robust case-control and blinded studies are yet to be conducted, in order to unify definitions and diagnosis techniques. 11-28% of the investigations for women with chronic pelvic pain, describe also incompetent pelvic veins[3]. There are many imaging techniques used to differentiate primary pelvic vein incompetence (known as idiopathic) from secondary PVI. Ultrasonography, laparoscopy, magnetic resonance, venography, may diagnose pathologies such as: deep vein thrombosis, Nutcracker syndrome[11], May-Thurner syndrome, which are all responsible for chronic pelvic pain and pelvic vein incompetence.

This study highlighted a positive relationship between chronic pelvic pain and pelvic vein incompetence in multiparous women, cases with retroverted uterus, or presence of ascites. Higher pelvic vein diameters were directly proportional with parity, and frequently seen in women with retroverted uterus. The incidence of retroverted uterus, in women with chronic pelvic pain, is higher than in the general population (19%)[12,13] 41,9% of the women experiencing chronic pelvic pain, examined in our clinic, had previous pelvic or abdominal surgery, implying a possible risk factor for this symptom, maybe due to intraperitoneal adhesions[12], nerve or muscle damage.

Concerning the vein dilatations, the majority of patients (76,9%) had pelvic vein diameters greater than 10 mm, supporting the hypothesis of pelvic pain generated by venous stasis and pelvic congestion which is aggravated by prolonged standing and sitting.

Smoking has an intimate relation with chronic pain, many theories being involved. Some authors believe that smoking affects indirectly the musculoskeletal function[14], leading to chronic pain, other that nicotine plays a role in the signaling pathways[15,7,14]. In our study there was no indication for smoking-venous dilation association.

Study limitations

Due to the retrospective character of this study, a questionnaire regarding subjective perception of the pain or a pain-log could not be obtained. Also a psychological profile was not made for all patients, thus we could not objectify how psychological symptoms and pathologies, like anxiety or depression, affects or cause higher perception of pain.

CONCLUSIONS

This study offers validation of some variables being contributors to chronic pelvic pain and higher pelvic vein diameters. With a variety of causes and multiple factors involved, the diagnosis of incompetent pelvic vein is challenging. Doppler ultrasonography is an important tool used for identification of the possible causes for chronic pelvic pain and also for assessing the characteristics of the pelvic veins.

DISCLOSURE STATEMENTS

The authors declare no personal o financial conflict of interest to disclose.

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