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Implications of surgical, hormonal and obstetric factors in the pathophysiology of pelvic floor disorders prolapse. Results on 103 cases operated with the Saba Nahedd technique

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Abstract

The prolapse of the pelvic organs is a pathologic condition that results from the deterioration of the support system of the pelvic organs. This system consists of pelvis structures which are organized on three levels of support whose deterioration cause apical and/or anterior and/or posterior compartment prolapse. The purpose of this article is to present the implications of different risk factors in the pathophysiology of pelvic floor disorders (PFD) on 103 women with symptomatic POP who have been operated with the surgical technique developed by Saba Nahedd. Our 103 cases have been examined and operated between 2013 and 2018. We have enrolled women aged between 31 and 81 years with symptomatic uterine prolapse grade I-IV and/or cystocele per magna and/or rectocele. All the 103 were preoperatively investigated through clinical examination, blood and urine test, colposcopy, cervical cytology (Pap Test), fractionated curettage, ultrasound and cystography. For all of the patients has been applied the surgical technique of attaching the uterine isthmus to the sheath of the rectus abdominis muscle using an isthmus strip. The results showed that surgical intervention in the pelvic area, traumatic deliveries with forceps application and menopause are associated with an increased risk of apical prolapse stage II, cystocele per magna and rectocele. Our study showed that conjunctive tissue is the central part of the integral theory developed by Petros who showed that destruction of the conjunctive tissues in the pelvic fascia and ligaments is responsible for the PFD.
Keywords: *apical prolapse, cystocele, rectocele, prolapse of the pelvic organs*

Abbreviations: *POPs= Prolapse of the pelvic organs; POPQ=pelvic organ prolapse quantitation system; OR= odd ratio; RR=relative risk; CI= confidence interval; BMI= body mass index; MC=menstrual cycle; PFD=pelvic floor disorders.*

Introduction

Prolapse of the pelvic organs (POPs) is a common pathology which refers to the herniation of the anterior and/or posterior and/or apical vaginal wall. This terminology is nowadays preferred instead of the older terms- cystocele or rectocele because they better describe the anatomic sites of the prolapsed organs[(1)]. The prevalence of the POPs is difficult to estimate due to the large amounts of studies that used different systems to classify the prolapse and reported different prevalence rates for symptomatic and asymptomatic POPs[(2)]. A symptomatic POP such as bulge symptoms, pelvic pains, obstructive voiding does represent an indication for a surgical treatment, the approach to the surgical procedure being individually decided depending on the age, hormonal and fertility status, weight and other associated co-morbidities of the women[(3)]. The options include reconstructive techniques through abdominal or vaginal route with or without the use of surgical meshes[(4)]. The advantages and disadvantages of the uterine-sparing techniques for POPs have been presented by many reports, however, there is still not sufficient data to support the concomitant hysterectomy at the time of surgery[(5)]. Hysterectomy has been traditionally performed for prolapse of the apical compartment in order to permit attaching the vaginal cuff to the sacrospinous ligament or to the anterior longitudinal ligament of the sacrum hence elevating and fixing the apical compartment. Moreover, with the removal of

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the uterus, the possibility of a cervical or endometrial neoplasia will be excluded although a retrospective study published in Frick et al.[6] reported a rate of 2.6% of uterine neoplasia after examining the hysterectomy specimens.

The aim of this article is to present the implications of some surgical, obstetric and hormonal factors in the pathophysiology of POPs in 103 women with symptomatic apical prolapse stages I-IV, cystocele per magna and rectocele who underwent the surgical intervention developed by Saba Nahedd (S.N.).

Methods

We enrolled 103 women with apical, anterior and posterior compartment prolapse. For each woman, the stage of the apical prolapse has been determined using the Pelvic Organ Prolapse Quantitation system (POPQ)[7]. For the anterior and posterior compartment prolapse we have used the traditional terms-cystocele per magna and rectocele. The surgical interventions have been performed between 01.10.2013 and 01.01.2018 at "Polizu" Clinical Hospital, "Alessandrescu-Rusescu" National Institute of Mother and Child Health from Bucharest, Romania. The age of the patients ranged between 31 and 81 years old with a median of 61.21 years.

A cervical cytology (Pap-Test) and a fractional curettage have been performed for all of the 103 cases in order to exclude a cervical and an endometrial neoplasia. Women with positive urine cultures, vaginal and/or cervical infections have been received antibiotic therapy before operation.

A cystography has been also performed to exclude functional and anatomical anomalies of the urinary bladder.

The results have been introduced and processed with the program IBM SPSS Statistics 20. We have used descriptive statistics for the characterization of the continuous and discrete variables, graphics and nonparametric tests such as the X2-Test for the association of two categorical variables with the calculation of odds ratio and relative risk, and the Mann-Whitney test to test the difference between two different groups.

Results

Repartition of patients according to age, year of diagnosis, number of vaginal deliveries and obstetrical complications.

The repartitions of the patients according to age, year of diagnosis (and operation), number of vaginal deliveries and obstetrical complications have been represented in Figures 1, 2, 3 and 4 and Tables 1, 2 and 3. The symptoms related to POPs were: pelvic pains, sensation of pressure, constipation and obstructive voiding symptoms. About 60 women (58.3%) originate from an urban area while the rest of 43 of patients (41.7%) come from the rural area.

Table 1 Minimum, maximum and mean value of age

Lot		N	Minimum	Maximum	Mean	SD
Study	Age (years)	103	31.00	81.00	61.2136	10.70427

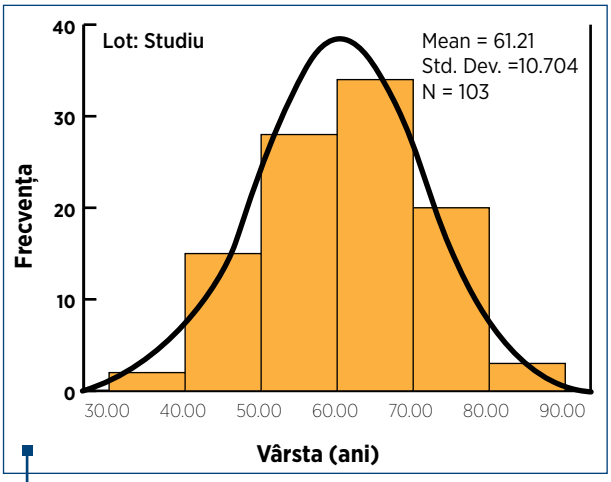

Figure 1. *Histogram with the repartition of the patients according to age*

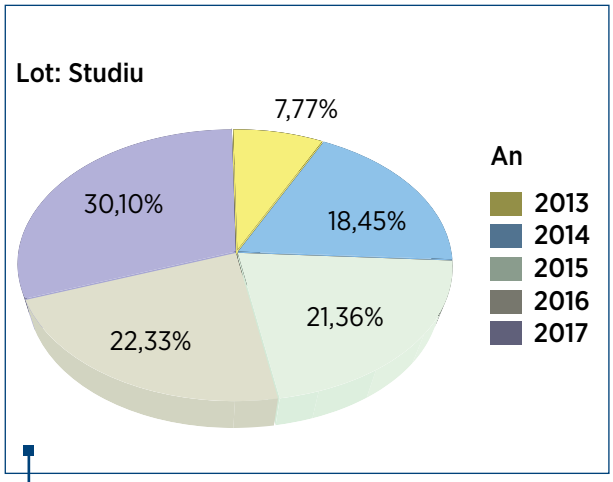

Figure 2. *Repartition according to year of diagnosis*

Table 2 Repartition according to number of vaginal deliveries

			Vaginal delivery		Total
			Yes	No	
Lot	Study	Count	84	19	103
		% within Lot	81.6%	18.4%	100.0%
		% within natural childbirth	54.2%	70.4%	56.6%
		% of Total	46.2%	10.4%	56.6%

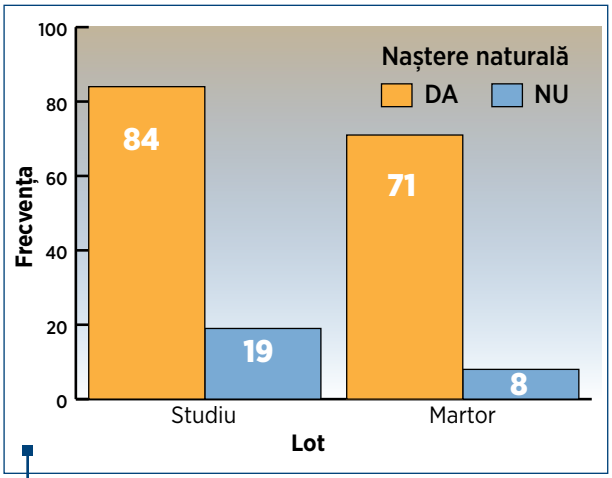

Figure 3. *Repartition according to number of vaginal deliveries*

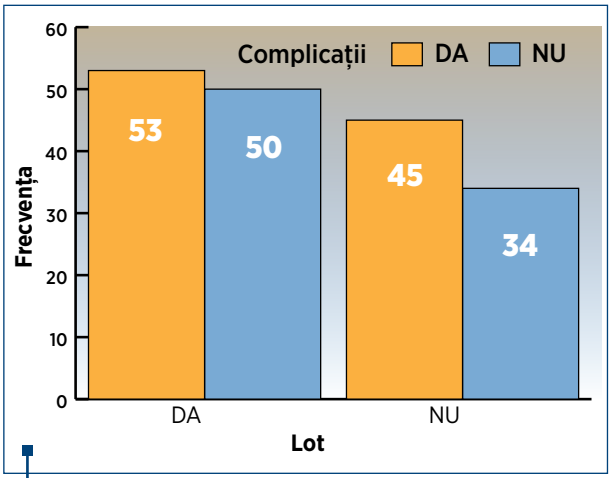

Figure 4. *Repartition of the obstetrical complications in our lot of study*

Table 3 Distribution according to obstetrical complications

			Complications		Total
			Yes	No	
Lot	Study	Count	53	50	103
		% within Lot	51.5%	48.5%	100.0%
		% within complications	54.1%	59.5%	56.6%
		% of Total	29.1%	27.5%	56.6%

In Figures 1, 2, 3 and 4 and Tables 1,2 and 3 we have represented the distribution of our lot according to age, year of diagnosis, natural childbirths and obstetrical complications during the natural childbirths. We observe that the age ranged between 31 and 81 years with a median of 61.21 years.

About 8 patients (7.77%) have been diagnosed and operated in 2013, 19 patients (18.45%) in 2014, 22 patients (21.36%) in 2015, 23 patients (22.33%) in 2016 and 31 patients (30.10%). Only 84 patients (81.6%) of 103 had at least one natural childbirth in antecedents. Of these 84 patients, 54.1% had either obstetrical complications in terms of perineal laceration and forceps delivery.

The distribution of the prolapse depending on stage was: 10 patients (9.7%) with apical prolapse stage 1, 61 patients (59.2%) with stage II apical prolapse, 34 patients (33.0%) with stage III apical prolapse and the rest of 5 patients (4.9%) with stage IV apical prolapse. About 100 of women (97.1%) of the 103 also presented cystocele per magnaand 66 patients (64.1%)of the 103 patients presented with a rectocele.

Table 4 Correlation surgical-factors, apical prolapse grade II

			Apical prolapse II		Total
			Yes	No	
Surgical factors	Yes	Count	11	9	20
		% within Surgical factors	55.0%	45.0%	100.0%
		% within Prolaps gr.II	18.0%	21.4%	19.4%
		% of Total	10.7%	8.7%	19.4%
	No	Count	50	33	83
		% within Surgical factors	60.2%	39.8%	100.0%
		% within Prolaps gr.II	82.0%	78.6%	80.6%
		% of Total	48.5%	32.0%	80.6%
Total		Count	61	42	103
		% within Surgical factors	59.2%	40.8%	100.0%
		% within Prolaps gr.II	100.0%	100.0%	100.0%
		% of Total	59.2%	40.8%	100.0%

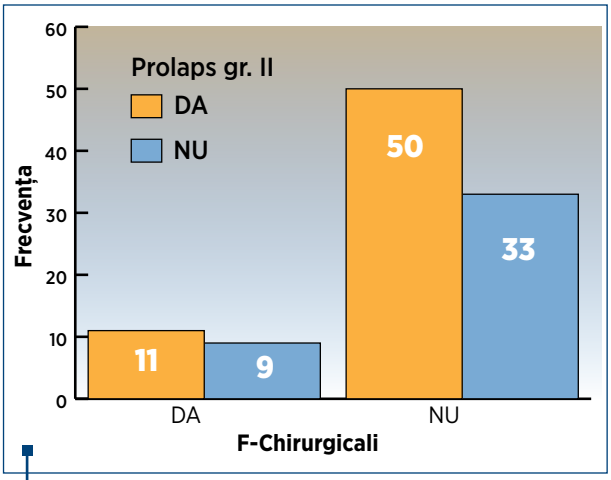

Figure 5. *Distribution of the surgical-F among patients with apical prolapse grade II*

Correlation between surgical, obstetrical and hormonal factors and stage of uterine prolapse, cystocele and rectocele using the X2 Test, Odd Ratio (OR), and Relative Risk (RR)

1. Surgical factors

1.1. Apical prolapse grade II

Applying the X2 Test we have obtained a correlation between surgical antecedents (e.g total hysterectomy) and stage II apical prolapse (Table 4 and Figure 5).

The results showed that the surgical factors increase the risk of stage two apical prolapse development (OR= 2.98; 95% CI=0.301, 0.559). In the same way, the risk of rectocele is 2.56 higher when the normal pelvic anatomy is disrupted due to surgical pelvic interventions (OR= 2.56, 95% CI = 0.484, 0.994) (Table 5 and Figure 6).

1.2. Rectocele

There was no association between surgical factors and apical prolapse stage I, III, IV and cystocele per magna.

2. Obstetric factors

2.1 Apical prolapse grade II

Obstetric factors such as traumatism at birth, forceps, perineal lesion were reported by 53 of 103 women (51.5%). These patients were 2.3 times more likely to present with stage two apical prolapse after applying the X2 –Test (OR= 2.30 and 95% CI = 0.190, 0.989) compared with the patients with no obstetrical antecedents (Table 6 and Figure 7).

2.2. Cystocele per magna

In Table 7 and Figure 8, it can be seen the correlation between obstetric factors and cystocele per magna.

Forceps delivery and grade III perineal lesions represented a risk factor for cystocele per magna (OR = 2.85, 95% CI=0.242, 0.46).

2.3. Rectocele

Similar to stage two apical prolapse and cystocele per magna, there was a correlation between obstetric factors and rectocele (OR= 5.4; 95% CI = 0.7.67, 0.908) compared to the rest of 50 (48.5%) patients with no obstetrical antecedents (Table 8 and Figure 9).

3. Hormonal factors

Pregnancy and early menopause were the most important factors associated with an increased risk of apical prolapse stages II and posterior prolapse (rectocele). There was no significant increase in the risk of apical prolapse stage I, III and IV and anterior prolapse (cystocele per magna).

For apical prolapse stage II we obtained an OR of 3.30 with a 95% CI=0.133, 0.690 after using the X2 test (Table 9, Figure 10).

Table 5 Correlation surgical factors and rectocele

			Rectocele		Total
			Yes	No	
Surgical factors	Yes	Count	14	6	20
		% within Surgical factors	70.0%	30.0%	100.0%
		% within Rectocele	21.2%	16.2%	19.4%
		% of Total	13.6%	5.8%	19.4%
	No	Count	52	31	83
		% within Surgical factors	62.7%	37.3%	100.0%
		% within Rectocele	78.8%	83.8%	80.6%
		% of Total	50.5%	30.1%	80.6%
Total		Count	66	37	103
		% within Surgical factors	64.1%	35.9%	100.0%
		% within Rectocele	100.0%	100.0%	100.0%
		% of Total	64.1%	35.9%	100.0%

3.1. Apical prolapse stage II

The risk of rectocele appear to be 2,50 higher compared to the group of women in whom no infleunce of the hormonal factors has been noted (OR=2.502; 95% CI = 0.089, 0.763) (Figure 11, Tables 9 and 10).

The risk of rectocele appear to be 2.505 higher compared to the group of women in whom no infleunce of the hormonal factors has been noted (OR=2.502; 95% CI=0.089, 0.763).

4. Influence of body mass index, menarche, menstrual cycle and menopause

Among the hormonal factors, we have investigated a possible impact of the body mass index (BMI), age at menarche, length of menstrual cycle (MC) and age at menopause on the appearance of pelvic floor disorders. The minimum, maximum and median values for BMI (Kg/m^2), menarche (years), length of menstrual cycle (days) and age at menopause (years) have been recorded in Table 11. We used the Independent Samples Kruskal-Wallis Test to find a possible correlation between these factors as a cause for each stage of apical prolapse (Table 12). A correlation between the hormonal factors and cystocele per magna ad rectocele has not been examined.

We can see that the distribution of the BMI values do not differ statistically significant between the stages of apical prolapse ($p=0.077 > \alpha=0.05$). Similarly, there was no statistically significant association between age at menarche ($p=0.543 > \alpha=0.05$), length of MC ($p=0.313 > \alpha=0.05$) and apical prolapse of all stages. On the other hand, the distribution of the menopause between all stages of prolapse differs significantly statistic (p=0.045, Table 11). Age at menopause between 52 and 53.5 years was a risk factor for apical prolapse stages I-IV which can be explained through an increase in the stiffness of the collagen fibers with age while the amount of elastic fibers decreases. Therefore, the elasticity of the pelvic ligaments and vaginal walls decreases and there is an insufficient tension to support the pelvic viscera.

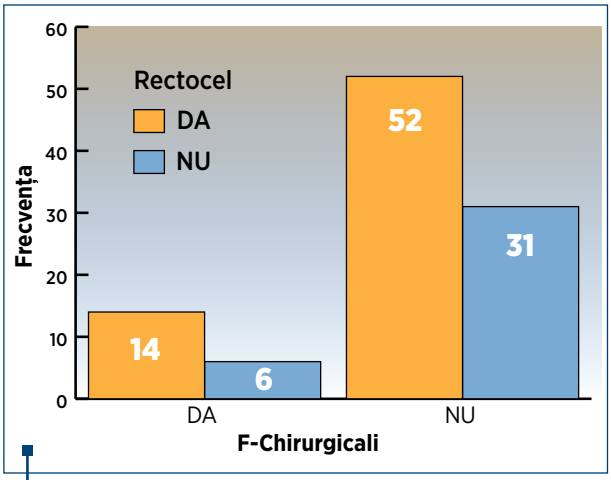

Figure 6. *Distribution of the surgical factors among patients diagnosed with rectocele*

Discussion

An integrated system formed by the pelvic floor muscles and the condensation of the endopelvic fascia, the uterosacral and cardinal ligaments, assures the support and stabilization of the pelvic viscera. The support structures have been divided in three levels of support: level 1 consists of the uterosacral and the cardinal ligaments whose loss of tension leads to cystocele. Level 2 includes

Table 6 Correlation between obstetric factors and apical prolapse stage II

			Apical prolapse II		Total
			Yes	No	
Obstetric factors	Yes	Count	30	29	59
		% within Obstetric factors	50.8%	49.2%	100.0%
		% within Prolaps gr.II	49.2%	69.0%	57.3%
		% of Total	29.1%	28.2%	57.3%
	No	Count	31	13	44
		% within Obstetric factors	70.5%	29.5%	100.0%
		% within Prolaps gr.II	50.8%	31.0%	42.7%
		% of Total	30.1%	12.6%	42.7%
Total		Count	61	42	103
		% within Obstetric factors	59.2%	40.8%	100.0%
		% within Prolaps gr.II	100.0%	100.0%	100.0%
		% of Total	59.2%	40.8%	100.0%

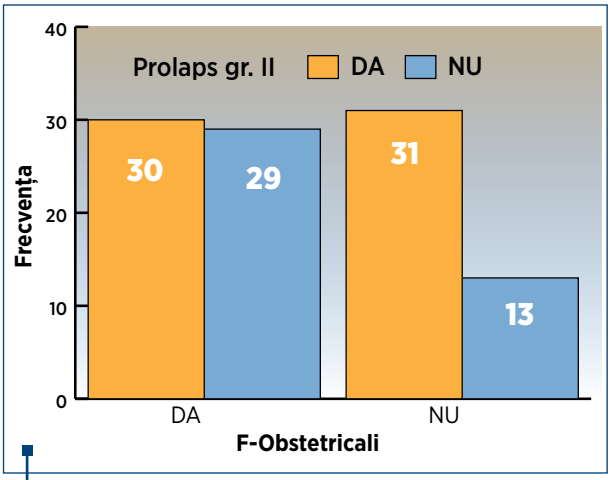

Figure 7. *Distribution of the obstetric factors among patients with apical prolapse grade II*

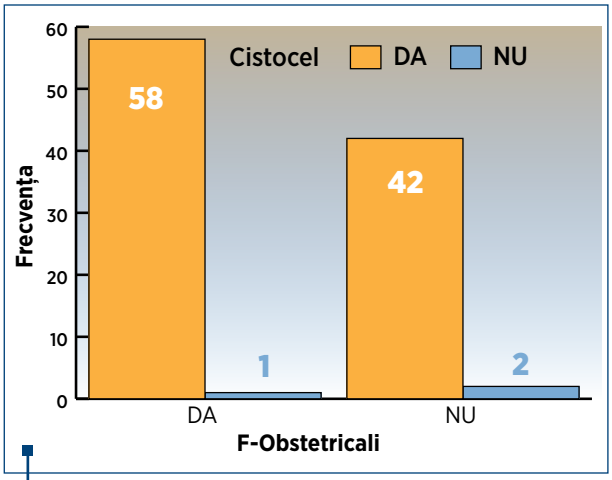

Figure 8. *Distribution of the obstetric factors among patients with cystocele per magna*

the attachments of the vagina to the the superior fascia of the levator ani muscle and the arcus tendineus fascia pelvis and is involved in the anterior vaginal wall prolapse while level 3 contains the perineal body, perineal membrane and the superficial and deep perineal muscles[8,9]. The loss of level 3 is a risk factor for the appearance of rectocele[9]. Risk factors showed to be associated with PFD are obesity, advancing age, parity[10]. Our purpose was to see if there is a correlation between surgical, obstetric and hormonal factors of 103 women with symptomaticapical and/or anterior and/or posterior prolapse who underwent the surgical reconstructive technique developed by S.N.

In our study were staged the apical prolapse according to the POPQ system. The main symptoms at presentation were: pelvic pains, bulge or pressure sensation, constipation and obstructive voiding. A complete anamneses of each patients with regard to age, area of provenience, number of pregnancies and childbirths, number of natural and/or caesarean sections complications at birth (e.g forceps application, perineal lesions grade III, traumatic childbirth), surgical antecedents (e.g total hysterectomy), BMI, age at menarche, length of MC, and age at menopause has been performed. After a rigorous clinical examination of all the vaginal compartments each of the patients has been diagnosed with apical stages I-IV and/or cystocele per magna and/or rectocele.

The surgical factors included interventions that can disrupt the normal pelvic anatomy such as a total

Table 7 Correlation obstetric factors and cystocele per magna

			Cystocele per magna		Total
			Da	Nu	
Obstetric-F	Da	Count	58	1	59
		% within F-Obstetricali	98.3%	1.7%	100.0%
		% within Cistocel	58.0%	33.3%	57.3%
		% of Total	56.3%	1.0%	57.3%
	Nu	Count	42	2	44
		% within F-Obstetricali	95.5%	4.5%	100.0%
		% within Cistocel	42.0%	66.7%	42.7%
		% of Total	40.8%	1.9%	42.7%
Total		Count	100	3	103
		% within F-Obstetricali	97.1%	2.9%	100.0%
		% within Cistocel	100.0%	100.0%	100.0%
		% of Total	97.1%	2.9%	100.0%

Table 8 Correlation obstetric factors and rectocele

			Rectocele		Total
			Yes	No	
Obstetric factors	Yes	Count	41	18	59
		% within Obstetric factors	69.5%	30.5%	100.0%
		% within Rectocele	62.1%	48.6%	57.3%
		% of Total	39.8%	17.5%	57.3%
	Nu	Count	25	19	44
		% within Obstetric factors	56.8%	43.2%	100.0%
		% within Rectocele	37.9%	51.4%	42.7%
		% of Total	24.3%	18.4%	42.7%
Total		Count	66	37	103
		% within Obstetric factors	64.1%	35.9%	100.0%
		% within Rectocele	100.0%	100.0%	100.0%
		% of Total	64.1%	35.9%	100.0%

hysterectomy or other interventions in the pelvic area. These were reported by 20 patients (19.4%) of the total 103. The obstetric factors referred to complications of a natural childbirth in terms of perineal lacerations grade III and forceps delivery. The hormonal factors considered in our study were the age at menarche and menopause, length of MC, BMI and pregnancy knowing that the hormonal status induces modifications of the collagen fibers that relax the vaginal wall and pelvic ligaments.

In order to find a correlation between the pathophysiology of the PFD and POPs we used the nonparametric tests and namely the X2-Test with the calculation of odds ratio and relative risk, and the Mann-Whitney-Test to see the difference between two different groups.

A total hysterectomy or other surgery in the pelvic area was associated with a 2.98 higher risk of apical prolapse grade II and a 2.56 higher risk of rectocele compared to the women with no other surgical procedures

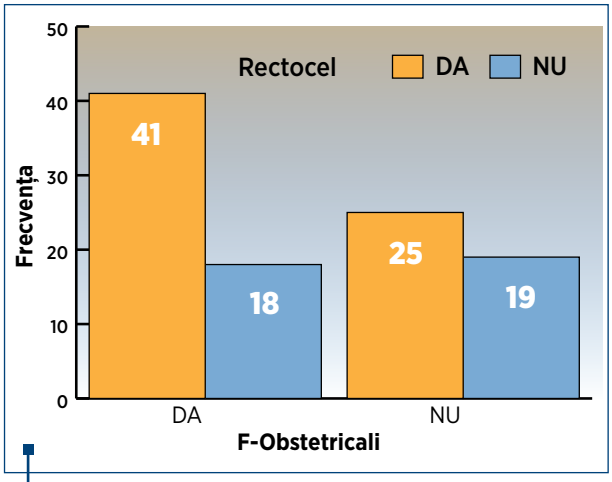

Figure 9. *Distribution of the obstetric factors among patients with rectocele*

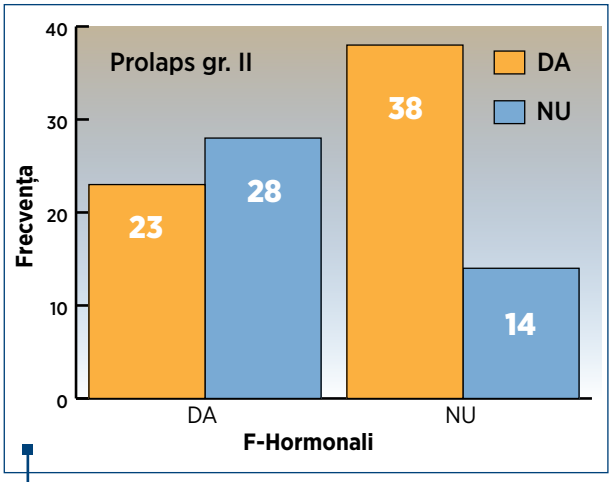

Figure 10. *Distribution of the hormonal factors among women with apical prolapse stage II*

Table 9 Correlation hormonal-F and apical prolapse stage II

			Apical prolapse II		Total
			Yes	No	
Hormonal-F	Yes	Count	23	28	51
		% within Hormonal factors	45.1%	54.9%	100.0%
		% within Prolaps gr.II	37.7%	66.7%	49.5%
		% of Total	22.3%	27.2%	49.5%
	No	Count	38	14	52
		% within Hormonal factors	73.1%	26.9%	100.0%
		% within Prolaps gr.II	62.3%	33.3%	50.5%
		% of Total	36.9%	13.6%	50.5%
Total		Count	61	42	103
		% within Hormonal factors	59.2%	40.8%	100.0%
		% within Prolaps gr.II	100.0%	100.0%	100.0%
		% of Total	59.2%	40.8%	100.0%

in antecedents. This is based on the central role of support of the uterosacral and cardinal ligaments[11]. A complete removal of the uterus decreases the tension in these ligaments, consequently the conjunctive tissue atrophies and cannot prevent the herniation of the pelvic viscera[11]. It has been showed that the laxity of the uterosacral ligaments, rectovaginal fascia and perineal body determines a decrease of the traction on the anterior rectal wall with anal incontinence and stool outlet obstruction[12]. A lax rectal anterior wall with decreases stiffness and dilated blood vessels leads to pelvic pain, venous stasis and anal hemorrhoids[13]. Our results showed no statistical significant increase in the risk of apical prolapses grade I, III, IV and cystocele per magna.

Apical prolapse grade II and rectocele have been also associated with obstetric factors like forceps delivery and perineal lesions. Moreover, the obstetric factors were a risk factor for the development of cystocele per magna. A forceps delivery is associated with 2.3 fold risk of apical prolapse stage II. The result correlated with the data published by different reports which showed a double risk for POPs after a forceps delivery[14]. However, there is no data with regard to the correlation with a specific stage of apical prolapse[14]. A forceps delivery may cause lesion of the levator musculature a pudendal nerve with consequent fecal or urinary incontinence[15]. With regard to the vacuum-assisted delivery there is currently insufficient data for a statistical significant association with PDF[16] while the

Table 10 Correlation between hormonal factors and rectocele

			Rectocele		Total
			Yes	No	
Hormonal factors	Yes	Count	38	13	51
		% within Hormonal factors	74.5%	25.5%	100.0%
		% within Rectocele	57.6%	35.1%	49.5%
		% of Total	36.9%	12.6%	49.5%
	No	Count	28	24	52
		% within Hormonal factors	53.8%	46.2%	100.0%
		% within Rectocele	42.4%	64.9%	50.5%
		% of Total	27.2%	23.3%	50.5%
Total		Count	66	37	103
		% within Hormonal factors	64.1%	35.9%	100.0%
		% within Rectocele	100.0%	100.0%	100.0%
		% of Total	64.1%	35.9%	100.0%

Table 11 Correlation between BMI, menarche, MC, menopause and apical prolapse stages I-IV after applying the Independent Samples Kruskal-Wallis Test

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of IMC (kg/m2) is the same across the categories of prolapse	Independent Samples Kruskal-Wallis	.077	Retain the null (H0) hypothesis
2	The distribution of age at menarche (years) is the same across the categories of prolapse	Independent Samples Kruskal-Wallis	.543	Retain the null (H0) hypothesis
3	The distribution of length of MC (days) is the same across the categories of prolapse	Independent Samples Kruskal-Wallis	.313	Retain the null (H0) hypothesis
4	The distribution of age at menopause (years) is not the same across the categories of prolapse	Independent Samples Kruskal-Wallis	.045	Retain the other (H1) hypothesis

prevalence of PDF has been demonstrated to be lower after caesarean section compared to vaginal deliveries[16,17]. In contrast with the surgical factors, we observe a significant increase in the risk of cystocele per magna after forceps deliveries or perineal lacerations. However, the decrease in the prevalence of operative vaginal delivery between 1989 and 2009 has resulted in a reduction of the number of traumatic deliveries and interventions for PDF[18,19].

A traumatic vaginal delivery appears to be significantly associated with the risk of rectocele, lesions of the anal sphincter during birth of the fetal head being the main cause for fecal and anal incontinence. Studies reported incidence rates for fecal and anal incontinence at 24 weeks postpartum of 9% and 24% respectively[20]. On the contrary, the incidence rates after caesarean section deliveries after a period of follow-up of 1 to 4 years ranged between 1-10% for fecal incontinence and between 1-11% for the anal incontinence[21].

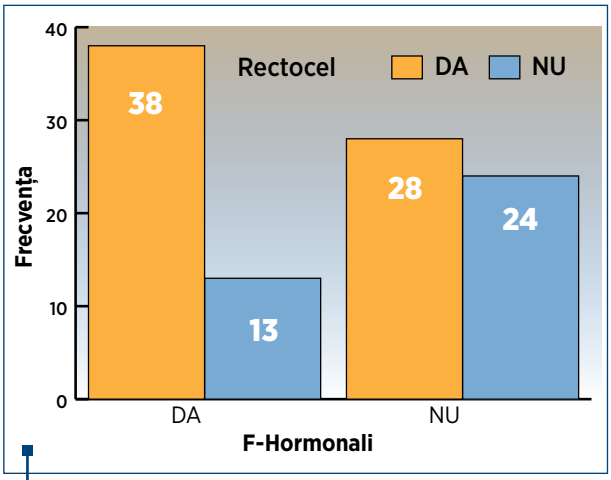

Figure 11. *Distribution of the influence of hormonal factors among women with rectocele*

Table 12 Minimum, maximum and median values for BMI (Kg/m^2), menarche (years), length of menstrual cycle (days) and age at menopause (years) according to the stage of apical prolapse. IQR= interquartile range

Statistics																
	BMI (Kg/m^2)				Menarche (years)				Length MC (days)				Menopause (years)			
	Prolapse				Prolapse				Prolapse				Prolapse			
	G-I	G-II	G-III	G-IV	G-I	G-II	G-III	G-IV	G-I	G-II	G-III	G-IV	G-I	G-II	G-III	G-IV
Mean	26.30	28.93	28.39	33.79	13.00	12.67	12.36	12.00	6.00	5.54	5.39	4.25	53.50	51.17	50.88	51.50
Median	24.34	28.76	27.17	33.18	14.00	12.00	12.00	12.00	6.00	5.00	5.00	4.00	53.50	51.00	50.00	52.00
Mode	23.19	23.49	34.21	28.88	14.00	12.00	13.00	12.00	6.00	5.00	4.00	3.00	52.00	49.00	50.00	52.00
Std. Deviation	4.4	4.0	2.98	5.41	2.00	1.41	1.45	0.00	.71	1.60	1.39	1.50	2.12	2.93	2.84	1.73
Minimum	23.19	23.21	24.99	28.88	10.00	10.00	10.00	12.00	5.00	3.00	3.00	3.00	52.00	45.00	43.00	49.00
Maximum	33.83	41.67	34.21	39.91	15.00	16.00	16.00	14.00	7.00	10.00	8.00	6.00	55.00	57.00	58.00	53.00

Finally, hormonal factors were involved in the pathophysiology of apical prolapse stage II and rectocele with no significant statistical correlation to apical prolapse stages I, III, IV and cystocele per magna. Among the hormonal factors we have investigated the role of BMI, age at menarche, length of CM and age at menopause. Only age at menopause and namely a median age of 52-53.5 years resulted to be correlated with the risk of apical prolapse stages I-IV. As mentioned above, the menopause makes the collagen fibers stiffer while the elastic fibers atrophy. This explains the laxity of the vaginal walls and support structures which determines the herniation of the pelvic viscera. Large epidemiologic studies in the U.S.A reported a 40% increase in the rate of POPs with every 10 years of age[22]. The rate of rectocele is higher in the group of women aged 70-79 years compared to ages between 60-69 years and 50-59 years[23].

Conclusions

Our study revealed significant correlation between different surgical, obstetric and hormonal factors and apical prolapse stage II, cystocele per magna and rectocele. Our results are in concordance with the integral theory developed by Petros PE who centered all the causes of PFD on the central role of the conjunctive tissue as a vital unity whose structure can be modified by fluctuations in the hormonal levels, advancing age, deliveries and surgical interventions in the pelvic area. ■

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