ISSN: 2091-2331 (Print) 2091-234X (Online)

Journal of Nobel Medical College

Volume 12, Number 02, Issue 23, July-December 2023, 85-90

Original Article

Pelvic Floor Dysfunction and Quality of Life among Hysterectomy Cases at B.P. Koirala Institute of Health Sciences

Subhadra Agrawal [1]*, Tulsa Basnet [1], Baburam Dixit [1], Aparna Hegde [2], Mohan Chandra Regmi [1]

[1]Department of Obstetrics and Gynaecology, B.P. Koirala Institute of Health Sciences, Dharan, Nepal, [2]Cama Hospital, Grant Medical College, Mumbai, India

Article Received: 18th October, 2023; Accepted: 13th December, 2023; Published: 31st December, 2023

DOI: https://doi.org/10.3126/jonmc.v12i2.61354

Abstract

Background

Pelvic floor dysfunction a global major female reproductive health burden associated with genitourinary and psychosocial symptoms even after hysterectomy has been underreported in the developing world. The study aimed to determine the early incidence of pelvic floor dysfunction and its psychological impact among post-hysterectomy women.

Materials and Methods

It was a prospective cohort study for 52 weeks among 130 post-hysterectomy cases at the tertiary care center. Pelvic floor dysfunction was diagnosed with the Pelvic Floor Disability Index and quality of life with the Pelvic Floor Impact Questionnaire. The association of pelvic floor dysfunction with epidemiological characters was analyzed using SPSS version 20.

Results

The incidence of pelvic floor dysfunction was 7.8% and the impact on the quality of life was 2.7% among 130 post-hysterectomy cases. Age, body mass index, comorbidities like chronic obstructive lung disease, and previous abdominal surgery were statistically significant. A parity of three or more, caesarian sections with instrumental delivery and abdominal hysterectomy was statistically significant with pelvic floor dysfunction and Socio-Psychological effect within the same groups of patients. The most common symptoms were urinary symptoms accounting for 9(90%) followed by prolapse 5 (50%) and colorectal 4(40%) with a score of 20.82± 9.07, 7.48±4.5 and 6.97± 1.55, and quality of life was mostly impacted by bladder symptoms 3 (100%) with a score of 24.96±2.96.

Conclusion

Pelvic floor dysfunction is a common health burden among post-hysterectomy cases especially with older age, higher Body Mass Index, Chronic Obstructive Pulmonary Disease, parity of more than three and caesarian sections with instrumental delivery.

Keywords: *Body mass index, Hysterectomy, Prolapse, Symptoms*

***Corresponding Author:**
Dr. Subhadra Agrawal
Lecturer
Email: subu.agr1@gmail.com
ORCID: http://orcid.org/0009-0007-4977-6319

Citation
Agrawal S, Basnet T, Dixit B, Hegde A, Regmi MC, Pelvic Floor Dysfunction and Quality of Life among Hysterectomy Cases at B.P. Koirala Institute of Health Sciences, JoNMC. 12:2 (2023) 85-90. DOI: https://doi.org/10.3126/jonmc.v12i2.61354

Introduction

Pelvic floor dysfunction (PFDS) is regarded as one of the major health burdens globally affecting millions of women. It comprises a broad range of clinical dysfunctions such as urinary and fecal incontinence, pelvic organ prolapses (POP) and sexual dysfunction resulting in costs for the healthcare system worldwide and affecting most domains of individual quality of life and daily function. The prevalence of these disorders in the general population is 23.7% (15.7% urinary symptoms, 2.9% prolapsed symptoms, and 9% colorectal symptoms [1].

Hysterectomy is considered one of the major gynecology procedures [2]. As per Shekar et al, 60% of women in the age group of 30-49 years underwent hysterectomy for benign reasons in rular area of India making those women vulnerable to PFD [3]. Although the association between hysterectomy and PFD has been controversial it is assumed that the incidence of post hysterectomy prolapses requiring surgical repair is 3.6 per 1000 cases [4]. A high prevalence of PFD symptoms was most commonly noticed among those who underwent abdominal hysterectomy [5].

This study aims to quantify the incidence of PFDs and quality of life (QOL) after hysterectomy in benign gynaecological conditions in our center as no study has been conducted previously.

Materials and Methods

This was a prospective descriptive study conducted in BPKIHS, Dharan. All patients who underwent Hysterectomy (Open and Vaginal Laparoscopic) from January 2021 to July 2021 were enrolled after consent. Primary data of participants were collected from inpatient and outpatient unit of Gynecology and Obstetric department. All cases were followed up ranging from three months to one year by clinic visit or by telephone. The ethical clearance was taken from the hospital ethical committee (BPKIHS IRC/2364/022). All the patients who underwent hysterectomy for benign conditions were included and patients with preexisting PFD symptoms, pelvic malignancy and (POP) were excluded in the study.

Convenient sampling was performed. Sample size was obtained with formula $Z^2p(1-p)/0.05^2$ taking a prevalence of 8.5%, confidence level 95% and margin of error 5% [6]. Accounting for 10% of non-responder final sample size was 130 The variables measured were age, BMI, Smoking, Parity, mode of delivery, menopausal status, comorbidities, an indication of surgery, hysterectomy route, duration of surgery, blood transfusion, duration of hospital stay duration of catheterization, urinary symptoms, fecal incontinence, sexual discomfort and quality of life pre-and post-operatively. The outcome variable is urinary symptoms, prolapse symptoms, colorectal symptoms and quality of life which was assessed via the Pelvic Floor Disability Index (PFDI-20) and Pelvic Floor Impact Questionnaire (PFIQ-7) scoring system. PFDI-20 has 20 items under three scales of the symptoms comprising Pelvic Organ prolapse Distress Inventory 6 (POPDI-6), Colorectal-Anal Distress Inventory 8(CARD-8) and Urinary Distress Inventory 6 (UDI-6) [6]. PFIQ-7 includes seven items under three scales, which are Urinary Impact Questionnaire (UIQ-7), the Colorectal- Anal Impact Questionnaire (CRAIQ-7) and Pelvic Organ Prolapse Impact Questionnaire (POPIQ-7). The mean scores of each scale and the total summary score were calculated respectively [6]. Data were entered in Microsoft Excel 2010 and analyzed using IBM SPSS version 20. Continuous data were reported as mean and standard deviation and categorical data as frequencies. Pre- and post-procedure outcomes were compared using PFDI-20 and PFIQ-7 scoring systems.

Results

There were 130 women enrolled in our study from January 2021 to July 2021. Among them, 3 were lost to follow-up after 6 months. These were patients from remote areas unreachable even by phone calls. Among the 127 cases who had hysterectomy symptoms of PFD developed among 7.8% (10 cases) and an effect in QOL was noticed in 2.37% (3 cases) who were among the 10 symptomatic patients which was confirmed with PFDI-20 and PFIQ-7 questionnaire, mean of all scores. (Figure 1)

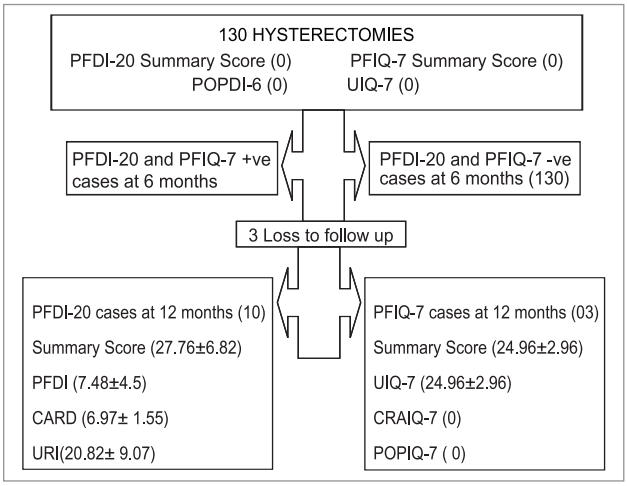

Figure 1: Flow chart of the enrolled patients with outcomes

Among all enrolled cases, mean age and BMI of the patients were 46.83 ± 7.24 and 25.83+- 4.45. respectively Median Parity among those participants was 3. Regarding mode of delivery, 2 patients were nulliparous, normal vaginal delivery was found to be the most common mode involving 87(68.5%), followed by caesarean section in 22 (17.3%). A combination mode of delivery was observed among 17 cases compromising 14 patients (11%) had both normal vaginal delivery and cesarean section 2 patients (1.5%) had a normal vaginal delivery and instrument devlivery and 1 patient (0.78%) had a cesarean section with instrumental delivery. 89 patients (70.07%) were menstruating and 38 patients (29.92%) were found at menopausal state. 66 cases were associated with co-morbidity most commonly systemic hypertension and diabetes mellitus. Previous abdominal surgery was among 32.2% of cases.

Among the 7.8% PFDI-20 group the POPDI-6, CRAD-8, UDI-6 and Mean Score of all 3 systems were 7.48 (±4.5), 6.97(± 1.55), 20.82(± 9.07) and 27.76(±6.82) respectively. Moreover, 2.37% of the PFIQ-7 group scale score in UIQ-7 was 24.96±2.96 and the Summary score was 24.96±2.96. Mean age (55.6±6.6), BMI (31.29± 2.7) previous history of abdominal surgery, parity more than 3, mode of delivery in the form of normal vaginal with instrumental delivery and COPD was statistically associated with PFDS and QoL. (Table 1)

Table 1: Clinico-epidemiological characteristics

Variables	Total (n=127)	PVD (n=10)	P value
Age			
➢ Mean	46.06 ± 7.24	55.6±6.6	0.00001
BMI	25.83 ±4.45	31.29± 2.7	0.0000
Previous abdominal surgery (yes)	41	7	0.039
Parity			
➢ 0	02	0	0.039
➢ 1	13	0	0.289
➢ 2	41	1	0.141
➢ 3	44	4	0.727
➢ >3	26	5	0.030
Mode of Delivery			
➢ NV	87 (68.5%)	06(60%)	0.582
➢ Cesarean	22 (17.3%)	00 (00%)	0.149
➢ NV+CS	14 (11%)	02(20%)	0.39
➢ NV+In	2 (1.5%)	01(10%)	0.07
➢ CS+In	1 (0.78%)	01(10%)	0.0192
Comorbidity			
➢ HTN	30 (26.2%)	3(30%)	0.645
➢ T2DM	16 (12.5%)	2(20%)	0.05
➢ Smoker	11 (8.66%)	4 (40%)	0.0022
➢ Thyroid disorder	10 (7.8%)	1(10%)	0.8

The Abdominal approach for hysterectomy was the major surgical approach in our study which included 115 (90.55%) and the laparoscopic approach was for 12 (9.45%) patients. Among the PFD cases, 70% of patients underwent abdominal hysterectomy and the remaining 30% had laparoscopic (p-value 0.04). The most common cause for the patients who underwent hysterectomy in our study was Fibroid Uterus 71, followed by Adnexal cyst 23, AUB failed to medical management 13, endometriosis 9, adenomyosis 8, and others 6. Fibroid 5 (50%) was the most common cause of hysterectomy in a symptomatic group of patients followed by AUB with failed medical treatment 3 (30%) and Cyst 2 (20%) respectively. (Figure 2)

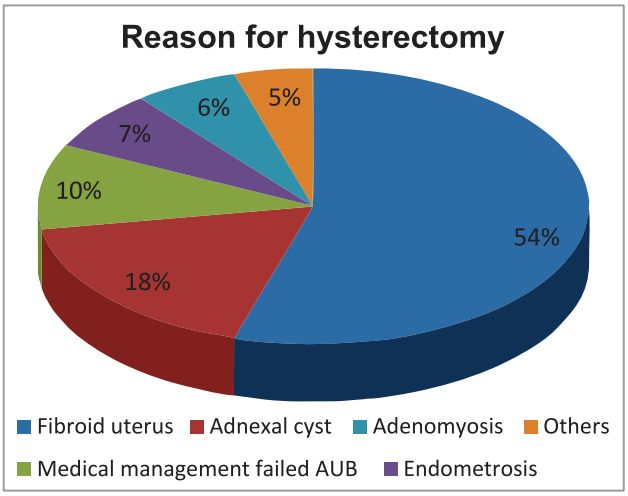

Figure 2: Reasons for hysterectomy among 130 cases

All patients were complaint to follow-up for six months without any symptoms however by the end of 1 year 3 were lost to follow up and 10 developed symptomatic PFD and 3 showed impact in QOL which was confirmed by the scoring system. Among the symptomatic patients, the most common symptoms were assessed using the PFDI-20 and PFIQ-7 questionnaires. In implementing the PFDI-20 scoring system among 10 symptomatic patients we found Urinary symptoms to be the most prominent one 10 (100%). UDI-6, POPDI-6, and CRAD-8 scoring system was used to sub-classify the symptoms further. Among 10 cases 2 patients have all subclass symptoms (urinary, rectal, and prolapse), 3 patients have urinary and rectal symptoms, 3 patients have prolapse and rectal symptoms and 4 patients have urinary and prolapse symptoms. Similarly, PFIQ-7 and its scale showed only impact on was due to bladder or urine which is 100% (3). (Table 3)

Table 3: Scores among PFDI-20 and PFIQ-7 patients

Scales	PFIQ-20 12 months	Score	Scales	PFIQ-7 12 months	Score
POPDI-6	5	7.48±4.5	UIQ-7	3	24.96±2.96
CRAD-8	4	6.97± 1.55	CRAIQ-7	0	0
UDI-6	9	20.82± 9.07	POPIQ-7	0	0
Summary score	10	27.76±6.82			24.96±2.96

Discussion

This study marks Nepal's pioneer study on PFDS and QOL after hysterectomy using the PFDI -20 and PFIQ-7 questionnaire scoring system [7]. Among 127 post-hysterectomy patient's incidence of PFD was found to be 7.8% (10) by the end of 1 year. The case detection rate of PFDI-20 by scoring system UDI-6, POPDI-6, and CRAD-8 were 7.1%, 3.9%, and 3.14% respectively, similarly in PFIQ-7 impact was detected in 2.37% only in UIQ-7 scale [1,7,8]. The pelvic floor structure is located within the bony pelvis, i.e. urogenital and anorectal viscera, pelvic floor muscle (PFM), and their connective tissues, nerves, and blood vessels. Despite multifactorial etiologies, PFD patients visit clinicians with urinary, genital, or rectal symptoms like urinary incontinence, anal incontinence, (POP) and sexual dysfunction affecting their physical and psychological life quality. It is estimated that women have a 25% lifetime risk of experiencing pelvic floor damage. Nearly 17% of women affected by pelvic floor disorder patient has poor quality of life as encountered by uro-gynecolog-ists [9, 10, 11]. Hysterectomy is one of the most common gynecological surgeries performed worldwide for various benign and malignant conditions. Surgery exposes injury of pelvic floor muscle and nerve tissue that may lead to urinary incontinence as urinary symptoms [12]. The pathology behind this is the gradual loss of the strength of pelvic floor muscles and to some extent injury to the neuromuscular support [11, 13]. Ligation of the uterine artery leading to vaginal atrophy combined with laxity after hysterectomy, tries to overcompensate by PFM tension, leading to a variety of pelvic floor symptoms [14, 15]. PFDS denovo symptoms among post-hysterectomy cases are common as found by Karta Stenstrom Bohlin et al, among 8.5 cases in Sweden. The common symptoms were residual urinary incontinence (16.1%) and urinary incontinence (13.3%) post-hysterectomy [6]. In our study, the sensitivity of UDI-6, POPDI-6 and CRAD-8 scores to detect pelvic urinary symptoms was 90%, 50% and 40% respectively. Among 10 cases 20% of patients had urinary, rectal and prolapse symptoms 30% had urinary and rectal symptoms 30% had prolapse and rectal symptoms and 40% had urinary and prolapse symptoms. Similar symptoms were reported since 1960 by Hanley et al in their review stating 25% of women with urethral syndrome-related symptoms or its worsening of previous symptoms either post hysterectomy or vaginal repair [16].

The mean age of post-hysterectomy patients in our study was 46.06. However, in a review of 711 consecutive cases of surgically managed pelvic organ prolapse at a university hospital in Finland the mean age was 62.4 years. In the developing world pelvic floor dysfunction occurs much earlier than developed world reasons compromising many socio-epidemiological characteristics like nutritional status, multiparity, health-seeking behavior differences, inaccessible health facilities and poor orientation of health care providers regarding PFDS workup [17]. Within the same geography, the proportion of hysterectomies has varied even among urban and rural women for various reasons. Sekhar et al, a survey in India emphasized that the prevalence of hysterectomy is higher in remote and rural areas compared to urban ones. The reasons could have been due to differences in socio-educational status and surgeon's preferences. Many rural women consider and interpret that post-parity uterus size not regressing to normal size is the cause of nonspecific pelvic and lower back symptoms being agreed for hysterectomy, especially in private setup [3].

The epidemiological characteristics of PFDS cases in our study consist of a mean age of 55.6±6.6. Other clinical determinants observed in our study were BMI 31.29 ± 2.7, postmenopausal 80% and parity with 3 or more 90% also observed comparable as in other studies [17, 18]. Karta Stenstrom Bohlin et al, focused that vaginal delivery, obesity and daily urge symptoms without incontinence before surgery increased denovo urinary incontinence. Similarly, obesity was statistically significant for PFD in our study (p-value 0.000). Obesity was observed in 20% of cases in the study, besides 11% of patients had gone under previous gynecological surgery in his cohort [6]. Virtanen et al, found stated average parity of 2.3 among the pelvic organ prolapse cases that went under the surgical procedure for symptom management [17]. Among post-surgical hysterectomy cases, a parity of 3 or more was markedly associated with the symptoms as explained by Mant et al in an Oxford Family Planning Association study. A parity of more

than three increases in risk of PFDS symptoms by elevenfold compared with nulliparous [4]. Nearly 50% of mother experience loss of pelvic floor support during their deliveries however only 10-20% seek medical care for their symptoms [19]. Besides focus on family planning at the policy level awareness regarding pelvic floor dysfunction symptoms and early health care-seeking behavior for these symptoms at delivery time would significantly prevent the increased risk of PFDS. A possible explanation for this finding is that the previously obstetrically traumatized tissue in the pelvis does not have the same ability to return to a correct anatomical position. The weakened pelvic floor from vaginal delivery and the increased intra-abdominal pressure in obese women risk her prone to urinary incontinence when important anatomical structures are removed from the pelvis.

Among comorbidities only smoking was strongly associated with PFDS (p 0.002) which is comparable to those reported from a study conducted in a Western industrialized country. Chronic smoking predisposes to obstructive lung disease increasing the intra-abdominal pressures. Besides smoking is associated with a chronic inflammatory process that weakens the bone, muscle and connective tissue strengths. In developing countries, biomass exposure is common among women, which might have aggravated the smoking pathology responsible for PFDS [5].

Normal Vaginal delivery is the most common mode of delivery worldwide followed by cesarean. Mother and child life is the primary goal during complicated obstetric cases sometimes demanding instrumentation or emergency surgical procedures. Multiple vaginal delivery, instrumentation and poor assess to institutional delivery are likely to increase the risk of PFDS [6]. In our study cohort proportion of vaginal delivery was 68.5% followed by the cesarean section and other modalities (combination of vaginal or caesarian or instrumentation) 17.3% and 13.9% respectively. However, PFDS was observed among 23.5% of other modalities of delivery (combination of vaginal or caesarian or instrumentation) followed by 6.9% of vaginal delivery and 0% among cesarean section. A prolonged follow-up of the cohort is needed to avoid the censoring of the incidences of PFDS in our cohort. There has been debate on the hysterectomy approach. It has been claimed that vaginal hysterectomy is the method of choice for these women and that laparoscopic techniques are usually unnecessary [20, 21]. Compared with the abdominal approach, vaginal hysterectomies were responsible for marginally lower rates of operative and perioperative complications. However, these might expose women to an increased risk of long-term postoperative procedures, especially PFDS. Among abdominal hysterectomy cases Maresh et al, found a lower proportion of postoperative complications in the laparoscopic approach compared to the trans-abdominal one [22]. However, in our study, PFDS was found more commonly among laparoscopic approaches than abdominal ones. The differences could have been due to the small proportion of sample size in our study. Patient characteristics, surgical expertise and surgeon preferences determine the hysterectomy approach. However prospective urogynaecology outcomes should be the primary factor to be considered for adopting the hysterectomy approach. The surgical approach should be largely determined by the women's indication together with other clinical findings, moreover, the surgeon's preferences and skills are equally important [23]. This study is a single-center hospital-based study with a limited sample size, so may not reflect the same result with a different technique in a different center and the finding of this study might not hold the exact mirror for the general population.

Conclusion

Pelvic floor dysfunction remains a very common morbidity. Socio-demographic factors, parity abdominal surgery, and surgical approach are the determinants of PFDS. PFDS remains under and delays reported as mild to moderate symptoms are assumed as normal findings by patients and clinicians. Awareness of women on pelvic floor symptoms and training primary as well as gynecologists to use PFDS assessment tools to quantify is likely to find the true burden and early interventions.

Acknowledgement: I would like to thank all the participants involved in this study.

Conflict of interest: None

References

[1] Nygaard I, Barber MD, Burgio KL, Kenton K, Meikle S, Schaffer J, et al, Whitehead WE, Wu J, Brody DJ, Pelvic Floor Disorders Network, Prevalence of symptomatic pelvic floor disorders in US women, Jama. 300:11 (2008) 1311-1316. DOI:10.1001/jama.300.11.1311.

[2] Pålsson M, Stjerndahl JH, Granåsen G, Löfgren M, Sundfeldt K, Patient-reported lower urinary tract symptoms after hysterectomy or hysteroscopy: a study from the Swedish Quality Register for Gynecological Surgery, International Urogynecology Journal. 28:9

(2017) 1341-1349. DOI:10.1007/s00192-017-3268-9.
[3] Shekhar C, Paswan B, Singh A. Prevalence, sociodemo-graphic determinants and self-reported reasons for hysterectomy in India, Reproductive health. 16:118 (2019) 1-6. DOI: 10.1186/s12978-019-0780-z
[4] Mant J, Painter R, Vessey M, Epidemiology of genital prolapse: observations from the Oxford Family Planning Association Study, BJOG: An International Journal of Obstetrics & Gynaecology. 104:5 (1997) 579-85. DOI: 10.1111/j.1471-0528.1997.tb11536.x.
[5] Nosti PA, Mc Dermott CD, Schilder JM, Stehman FB, Woodman PJ, Symptoms of pelvic floor disorders and quality of life measures in postoperative patients with endometrial cancer, Clinical Ovarian and Other Gynecologic Cancer. 5:1 (2012) 27-30. DOI:10.1016/j.cogc.2012.04.002.
[6] Bohlin KS, Ankardal M, Lindkvist H, Milsom I, Factors influencing the incidence and remission of urinary incontinence after hysterectomy, American Journal of Obstetrics and Gynecology. 216:1 (2017) 1-9. DOI:10.1016/j.ajog.2016.08.034.
[7] Barber M, Walters MD, Bump RC, Short forms of two condition-specific quality-of-life questionnaires for women with pelvic floor disorders (PFDI-20 and PFIQ-7). American journal of obstetrics and gynecology. 193:1 (2005) 103-113. DOI:10.1016/j.ajog.2004.12.025.
[8] Vermeulen CK, Veen J, Adang C, Coolen AL, van Leijsen SA, Bongers MY et al, Long-term pelvic floor symptoms and urogenital prolapse after hysterectomy, BMC Women's Health. 23:1 (2023) 1-9. DOI:10.1186/s12905-023-02286-3.
[9] Harvey MA, Chih HJ, Geoffrion R, Amir B, Bhide A, Miotla P, et al, International Urogynecology Consultation Chapter 1 Committee 5: relationship of pelvic organ prolapse to associated pelvic floor dysfunction symptoms: lower urinary tract, bowel, sexual dysfunction and abdominopelvic pain, International Urogynecology Journal. 32:10 (2021) 2575-2594. DOI: 10.1007/s00192-021-04941-5.
[10] Alas AN, Chinthakanan O, Espaillat L, Plowright L, Davila GW, Aguilar VC, De novo stress urinary incontinence after pelvic organ prolapse surgery in women without occult incontinence, International urogynecology journal. 28:4 (2017) 583-590. DOI: https://doi.org/10.1007/s00192-016-3149.
[11] Lykke R, Blaakær J, Ottesen B, Gimbel H. Pelvic organ prolapse (POP) surgery among Danish women hysterectomized for benign conditions: age at hysterectomy, age at subsequent POP operation, and risk of POP after hysterectomy, International Urogynecology Journal. 26:4 (2015) 527-532. DOI: 10.1007/s00192-014-2490-y.
[12] Ekanayake C, Pathmeswaran A, Herath R, Wijesinghe P, Vaginal, sexual and urinary symptoms following hysterectomy: a multi-centre randomized controlled trial, Women's Midlife Health. 12:6 (2020) 1-7. DOI: 10.1186/s40695-020-0049-2.
[13] Ottesen M, Validity of the registration and reporting of vaginal prolapse surgery. Ugeskrift for laeger. 171:6 (2009) 404-408. PMID: 19208327.
[14] Quaghebeur J, Petros P, Wyndaele JJ, De Wachter S, Pelvic-floor function, dysfunction, and treatment. European Journal of Obstetrics & Gynecology and Reproductive Biology. 265:1 (2021) 143-149. DOI:10.1016/j.ejogrb.2021.08.026.
[15] Petros P, Influence of hysterectomy on pelvic-floor dysfunction, The Lancet. 356:9237 (2000) 1275. DOI: https:10.1016/S0140-6736(05)73879-4.
[16] Hanley Hg, The Late Urological Complications of Total Hysterectomy, British journal of urology. 41:6 (1969) 682-684. DOI:10.1111/j.1464-410X.1969.tb09977.x.
[17] Virtanen HS, Mäkinen JI, Retrospective analysis of 711 patients operated on for pelvic relaxation in 1983-1989, International Journal of Gynecology & Obstetrics. 42:2 (1993) 109-115. DOI: 10.1016/0020-7292(93)90622-4.
[18] Olsen AL, Smith VJ, Bergstrom JO, Colling JC, Clark AL, Epidemiology of surgically managed pelvic organ prolapse and urinary incontinence, Obstetrics & Gynecology. 89:4 (1997) 501-506. DOI: 10.1016/S0029-7844(97)00058-6.
[19] Beck RP, Pelvic relaxational prolapsed, Principles and practice of clinical gynecology, New York: John Wiley & Sons. 22:2 (2012) 85-92. PMID: 22876071.
[20] Cohen MM, Young W, Costs of hysterectomy: does surgical approach make a difference? Journal of Women's Health. 7:7 (1998) 885-892. DOI:10.1089/jwh.1998.7.885.
[21] Richardson RE, Bournas N, Magos AL, Is laparoscopic hysterectomy a waste of time? The Lancet. 345:8941 (1995) 36-41. DOI:10.1016/S0140-6736(95)91158-8.
[22] Maresh MJ, Metcalfe MA, McPherson K, Overton C, Hall V, Hargreaves J, et al, The value national hysterectomy study: description of the patients and their surgery, BJOG: An International Journal of Obstetrics & Gynaecology. 109:3 (2002) 302-312. DOI:10.1111/j.1471-0528.2002.01282.x.
[23] Dorsey JH, Steinberg EP, Holtz PM, Clinical indications for hysterectomy route: patient characteristics or physician preference? American journal of obstetrics and gynecology. 173:5 (1995) 1452-1460. DOI:10.1016/0002-9378(95)90632-0.