J Mind Med Sci. 2018; 5(1): 46-52
doi: 10.22543/7674.51.P4652

Review

Pelvic floor disorders in gynecological malignancies. An overlooked problem?

Oana M. Bodean[1*], Radu D. Marcu[2], Dan A. Spinu[2], Bogdan Socea[3], Camelia C. Diaconu[4], Octavian Munteanu[5], Nicoleta Taus[6], Monica Cirstoiu[7]

[1]Emergency University Hospital Bucharest, Department of Obstetrics and Gynecology, Bucharest, Romania
[2]Carol Davila Central Military University Emergency Hospital, 3rd Department of Urology, Bucharest, Ro
[3]Department General Surgery, [4]Department of Internal Medicine, [5]Department of Anatomy, [7]Department of Obstetrics and Gynecology, Carol Davila University of Medicine and Pharmacy, Bucharest, Romania
[6]Transylvania University of Brasov, Faculty of General Medicine, Brasov, Romania

Abstract

Cervical, endometrial, ovarian, vulvar, and vaginal cancers affect women of a broad age spectrum. Many of these women are still sexually active when their cancer is diagnosed. Treatment options for gynecological malignancies, such as gynecological surgery, radiation, and chemotherapy, are proven risk factors for pelvic floor dysfunction. The prevalence of urinary incontinence, fecal incontinence, and sexual dysfunction before cancer treatment is still unclear. Hypotheses have been raised in the literature that these manifestations could represent early symptoms of pelvic cancers, but most remain overlooked even in cancer surviving patients.

The primary focus of therapy is always cancer eradication, but as oncological and surgical treatment options become more successful, the number of cancer survivors increases. The quality of life of patients with gynecological cancers often remains an underrated subject. Pelvic floor disorders are not consistently reported by patients and are frequently overlooked by many clinicians. In this brief review we discuss the importance of pelvic floor dysfunction in patients with gynecological malignant tumors.

Keywords : gynecological cancers, pelvic floor disorders, urinary incontinence

Highlights

- ✓ pelvic floor disorders are not consistently reported by patients and are frequently overlooked by many clinicians
- ✓ a comprehensive care in gynecological cancer surviving women should be handled by a multidisciplinary team of specialists in order to improve overall quality of life in these patients

To cite this article: Bodean OM, Marcu RD, Spinu DA, Socea B, Diaconu CC, Munteanu O, Taus N, Cirstoiu M. Pelvic floor disorders in gynecological malignancies. An overlooked problem? J Mind Med Sci. 2018; 5(1): 46-52. DOI: 10.22543/7674.51.P4652

✉ *Corresponding author: Oana Bodean, Emergency University Hospital, 169 Splaiul Independentei Street, Bucharest, Romania, e-mail: oanamb8@gmail.com

Introduction

Women with pelvic floor dysfunction experience a multitude of symptoms that negatively affect their quality of life. Urinary incontinence, pelvic organ prolapse, sexual dysfunction, fecal incontinence, and various pain syndromes are most commonly encountered in these patients. In the general population of healthy non-pregnant women, the overall prevalence of pelvic floor disorders varies between 30% and 50% depending on the criteria and definitions applied. The prevalence increases with age and is more frequent in older women. Incontinence and sexual dysfunction are often seen as problems of old age. Due to many reasons, either social barriers or preconceptions, many women do not talk about these problems with their physician (1).

Pelvic dysfunction is common in women with different types of cancer, especially with cervical, endometrial, vulvar, vaginal, ovarian, fallopian tube, and primary peritoneal tumors. These disorders can be caused directly by cancer involving pelvic organs, but more often they are side effects of cancer treatment. Sometimes, cancer invades retroperitoneal organs, especially the ureters, causing direct invasion or compression. Furthermore, this can affect renal function (1-5). Treatment options that can be risk factors for pelvic dysfunctions are radiotherapy, surgery, chemotherapy, and hormonal treatment. These treatments exert both direct and indirect effects resulting in functional anatomy, neurological, vascular, and myofascial alterations (6, 7).

Each of the five main types of gynecological cancers (cervical, uterine, ovarian, vulvar, and vaginal) has its symptoms, its risk factors, and its burden (8), with a variety of specific or non-specific symptoms or even paraneoplastic symptoms (9).

In the past decade, researchers presumed that pelvic floor dysfunction was present in women who were suspected for gynecological malignancy prior to the time of surgery. Many of these women just dealt with the dysfunction, despite the fact that it lowered their quality of life. In fact, the quality of life took a second place, the main objective being cancer eradication. Pelvic floor disorders persisted or worsened in some of the surviving patients after cancer treatment, but the issue has been poorly investigated (10, 11).

Despite efforts in screening and prevention, the incidence of gynecological cancer will continue to grow over the next decades. Hopefully, the advances in treatment may decrease the mortality rate (12). As stated by many literature studies, the prognosis of localized gynecologic tumors in developed countries is excellent, with 5-year survival rates over 90%. Radical pelvic surgery is critically important in the management of these cancers, but it comes with the risk of urological complications. Ureters can be injured during surgery, and lymph node dissection and extensive surgery can damage pelvic nerves, blood vessels, and pelvic floor muscles, resulting in low urinary tract dysfunction (13-16).

Understanding pelvic floor dysfunction in women with suspected gynecological malignancies is limited. The prevalence of such disorders before surgery is also poorly investigated (17). Moreover, the impact of gynecological oncological treatment of pelvic floor disorders is not well understood and frequently remains undiscussed with oncologic patients. Our aim in this review is to highlight the importance of pelvic floor dysfunction in women with suspected gynecologic cancer and also in women who have received cancer treatment.

Discussion

Pelvic floor disorders in women suspected of gynecological cancers

In 2012, the European Agency for Research on Cancer (EUCAN) (18) reported the following estimated incidence and mortality in Europe and Romania for three of the most frequent gynecological malignancies (Table 1) (18, 19).

Table 1. Estimated incidence of gynecologic cancers in Europe and Romania, 2012

Cancer type	Estimated incidence in Europe (%)	Estimated incidence in Romania (%)
Corpus uteri	6.16	4.32
Cervix uteri	3.64	12.20
Ovary	4.08	5.20

The estimated mortality for the same types of cancers in Europe and Romania are shown in Table 2 (18, 19).

Table 2. Estimated mortality of gynecologic cancers in Europe and Romania, 2012 (18,19).

Cancer type	Estimated mortality in Europe (%)	Estimated mortality in Romania (%)
Corpus uteri	3.05	1.85
Cervix uteri	3.13	9.85
Ovary	5.48	5.26

In 2012, Romania held first place amongst European countries in the estimated incidence and mortality for cervical cancer (18-20).

Siegel et al. report that in 2016 more than 100.000 women were diagnosed with gynecological cancers in the US. Although cancer diagnosis and eradication remain the primary focus of care, the prevalence of pelvic floor dysfunction manifesting as urinary incontinence and other bladder and bowel disorders at baseline, before patients received surgery, is unclear (21).

Bretschneider et al. investigated the existence of pelvic floor dysfunction in 152 patients with presumed gynecologic malignancy prior to surgery. Overall prevalence of urinary incontinence was 40.9%, among which stress incontinence was 33.3% and urge incontinence was 25%. Fecal incontinence was found in 3.9% of cases. The authors concluded that pelvic floor disorders are frequent in women suspected of gynecologic cancers and should not be overlooked (17).

Ramasheshan et al. studied the prevalence of pelvic floor disorders in a systematic review of the literature. The research also focused on specific types of malignancy. In patients with cervical cancer, stress urinary incontinence was noted in 24-29% of cases, urinary incontinence in 8-18%, and fecal incontinence in 6% of cancer patients before treatment. In patients with uterine cancer, the pre-treatment prevalence of stress urinary incontinence was 29-36%, of urge urinary incontinence15-25%, and of fecal incontinence 3% (22). The authors also investigated the prevalence of pelvic floor dysfunction in cancer survivors after treatment, as described further in this article.

Thomas et al. found prolapse in 7% of patients with endometrial cancer prior to treatment (23).

The importance of pelvic floor dysfunction as an early symptom of gynecological malignant tumors was also hypothesized and investigated in women with ovarian cancer. Due to the poor survival outcomes of advanced ovarian cancer, early diagnostic strategies are continuously investigated. Researchers have explored the potential of using patient-reported symptoms as a screening tool to promote early detection. Several symptom indices have been tested, among which the most widely evaluated is the Goff index. Goff et al. found that women with ovarian cancer frequently reported non-specific symptoms prior to diagnosis and thus proposed their initial index in 2007 (24). The original index included pelvic/abdominal pain, increased abdominal size/bloating, and difficulty in eating/feeling full. The modified index introduced by Kim et al. added two urinary symptoms, urgency and frequency, although their predictive role in ovarian malignancy was inconsistent (25). Shetty et al. investigated the predictive value of symptoms in ovarian cancer including frequency, urgency, and other urinary symptoms and noted that these symptoms were more frequently reported by ovarian cancer patients as compared to controls at 3 to 14 months before cancer diagnosis (26). Further investigations are needed to determine the significance of this particular symptom cluster.

Pelvic floor disorders after cancer treatment

Pelvic floor dysfunction in gynecological cancer survivors is common; it can be caused by the cancer itself, but mostly it is the sequelae of treatment. It manifests as urinary incontinence, other bladder storage and voiding difficulties, fecal incontinence, pelvic pain, and sexual problems (27, 28). Cancer treatment options include radical surgery, radiotherapy, chemotherapy, or hormonal medication, all of which come with specific negative outcomes. Radical hysterectomy and radiotherapy disrupt the anatomy of the pelvic floor and the local nerve supply to the pelvic floor muscles. Bladder and bowel symptoms are common among cancer survivors, and these may persist long after treatment and adversely affect quality of life (13, 19, 20).

Rutledge et al. noted that 67% of women who survived disease and were treatment free for more than a year reported moderate to severe urinary incontinence (29). Manchana et al. reported that up to two-thirds of cervical cancer survivors after radical hysterectomy had urodynamic abnormalities. Half of them had voiding dysfunction and one-third had storage dysfunction (30).

Hazewinkel et al. reported stress incontinence after radical hysterectomy and lymph node dissection in 19-81% of patients. Moreover, they found that surgery with adjuvant radiotherapy as compared to surgery alone had two times more severe urological complications and that primary radiotherapy was associated with increased

urgency to void and fecal incontinence in 8-67% of cases (31).

Ramaseshan et al. performed a systematic review of 31 articles to investigate the prevalence of pelvic floor dysfunction in women with gynecological cancers, according to the specific types of malignancy. They also compared the prevalence of pelvic floor dysfunction with the general population. In women with cervical cancer, they noted a 4-76% post-treatment prevalence of stress urinary incontinence, a 4-59% post-treatment prevalence of urge incontinence, and a 2-34% prevalence of fecal incontinence. Cervical cancer treatment also caused urinary retention 0.4-39% and dyspareunia 7-39% (22).

Some researchers noted that urinary incontinence rates tended to be highest in the early post-operative period. Ceccaroni et al. found a urinary incontinence rate of 55% at 1 month after surgery (32), while Naik et al. found urinary incontinence rates of 48% and 17% respectively at 1.5 months and after 12 months after surgery (33).

In patients with uterine cancer, urinary incontinence affected 15% of women who underwent surgery only, and 43% of women who underwent surgery plus external beam radiation therapy (EBRT). The study by Nosti et al. was the only study that evaluated prolapse in women with endometrial cancer after surgery. They found pelvic organ prolapse in 44% of 25 women with endometrial cancer at more than 6 months after surgery (34).

Ovarian cancer survivors had a prevalence of stress urinary incontinence of 32%-42%, urge urinary incontinence 15%-39%, prolapse 17% and sexual dysfunction 62-75%. Data regarding pelvic floor disorders in ovarian cancer survivors are limited, probably because the majority of patients are diagnosed in advanced stages III/IV which are associated with 5-year survival rates of only 20-35% (13, 20).

Vulvar cancer survivors had a post-treatment prevalence of 15-39% for stress urinary incontinence and 1-20% for fecal incontinence (19, 34).

Gynecological cancer and treatment procedures have a severe impact on sexual health, on body image, and on fertility. Sexual morbidity is also an undertreated issue in cancer survivorship, as found in a growing number of studies (27, 28). Coady et al. found that up to 55% of women treated for gynecological cancer report dyspareunia (35-37).

In their study on sexual function in women and girls with cancer, Lindau et al. noted that the majority of women affected by gynecologic and breast cancer were sexually active in the year prior to diagnosis, including the majority of older women aged 60 to 80 who have a partner. The authors raised the awareness about the need for preservation of sexual function and improvement of quality of life in such patients (38-40).

Lindgren et al. investigated how gynecological cancer survivors relate their incontinence to their quality of life, and how much information they had regarding pelvic muscle training and other strategies to improve their situation. The results showed a reduction in physical and psychosocial quality of life and in sexual activity due to incontinence. Moreover, many women did not know about pelvic floor therapy and how it might improve their situation (41, 42).

Conclusions

Pelvic floor disorders are widely encountered in women who survive gynecological cancers, and an increasing body of evidence shows that these problems are present at baseline, before initiation of cancer therapy. Because the primary focus in therapy is cancer eradication, pelvic floor disorders are frequently overlooked by both patients and specialists, although they have a major impact on patients' quality of life. Future research should focus on improving quality of life in cancer survivors using treatments that cause less damage to the pelvic floor compartment. Moreover, screening for pelvic floor disorders should be performed more often in patients suspected or already diagnosed with gynecological cancer.

We conclude by stating that comprehensive care in gynecological cancer surviving women should be handled by a multidisciplinary team of specialists in order to improve overall quality of life in these patients.

Acknowledgment

All authors have equal contribution to this article and have no conflicts of interest to disclose.

References

1. Jundt K, Peschers U, Kentenich H. The investigation and treatment of female pelvic floor dysfunction. *Dtsch Arztebl Int*. 2015; 112 (33-34): 564–74. PMID: 26356560, DOI: 10.3238/arztebl.2015.0564
2. Peride I, Rădulescu D, Niculae A, Ene V, Bratu OG, Checheriță IA. Value of ultrasound elastography in the diagnosis of native kidney fibrosis. *Medical Ultrason*. 2016; 18(3): 362-69. PMID: 27622414

3. Niculae A, Peride I, Marinescu-Paninopol A, Vrabie CD, Ginghină O, Jecan CR, Bratu OG. Renal artery bilateral arteriosclerosis cause of resistant hypertension in hemodialysed patients. *Rom J Morphol Embryol*. 2016; 57(2): 591-4. PMID: 27516040
4. Checheriţă IA, Smarandache D, Rădulescu D, Peride I, Bratu O, Ciocâlteu A, Sebe I, Lascăr I. Calcific uremic arteriolopathy in hemodialyzed patients. *Chirurgia (Bucur)*. 2013; 108(5): 736-40. PMID: 24157123
5. Constantinoiu S, Bîrlă R, Iosif C, Cociu L, Gindea C, Hoară P, Ruşitoru L. Difficulties in diagnosis and surgical treatment of a giant retroperitoneal lipoma. *Chirurgia(Buchur)* 2009; 104(3): 363-7. PMID: 19601474
6. Radulescu D, Stroescu A, Pricop C, Geavlete B, Negrei C, Bratu O, Vacaroiu I. Vitamin K Influence on Cardiovascular Mortality in Chronic Hemodialysed Patients. *Rev Chim (Bucharest)*. 2017; 68(1): 52-54.
7. Chase DM, Watanabe T, Monk BJ. Assessment and significance of quality of life in women with gynecologic cancer. *Future Oncol*. 2010; 6(8): 1279-87. PMID: 20799874, DOI: 10.2217/fon.10.96
8. Sinescu RD, Niculae A, Peride I, Vasilescu F, Bratu OG, Mischianu D, Checheriţă IA. Uterus neuroendocrine tumor–a severe prognostic factor in a female patient with alcoholic cirrhosis undergoing chronic hemodialysis. *Rom J Morphol Embryol*. 2015; 56(2): 601-5. PMID: 26193237
9. Bratu O, Mischianu D, Spanu D, Barla R, Hoara P, Constantinoiu S. Paraneoplastic Syndrome in Primitive Retroperitoneal Tumours. *Chirurgia (Bucur.)* 2013; 108(1): 26-31. PMID: 23464765
10. DeLancey JO. The hidden epidemic of pelvic floor dysfunction: achievable goals for improved prevention and treatment. *Am J Obstet Gynecol*. 2005; 192(5): 1488-95. PMID: 15902147, DOI: 10.1016/j.ajog.2005.02.028
11. Hatchett L, Hebert-Beirne J, Tenfelde S, Lavender MD, Brubaker L. Knowledge and perceptions of pelvic floor disorders among African American and Latina women. *Female Pelvic Med Reconstr Surg*. 2011; 17(4): 190-4. PMID: 22453850, DOI: 10.1097/SPV.0b013e318229dd5c
12. Pahonțu E, Paraschivescu C, Ilieș DC, Poirier D, Oprean C, Păunescu V, Bratu O. Synthesis and Characterization of Novel Cu(II), Pd(II) and Pt(II) Complexes with 8-Ethyl-2-hydroxytricyclo(7.3.1.0(2,7))tridecan-13-one-thiosemicarbazone: Antimicrobial and in Vitro Antiproliferative Activity. *Molecules*. 2016; 21(5). pii: E674. PMID: 27213326, DOI: 10.3390/molecules21050674
13. Martínez-Mesa J, Werutsky G, Michiels S, Pereira Filho CAS, Dueñas-González A, Zarba JJ, Mano M, Villarreal-Garza C, Gómez H, Barrios CH. Exploring disparities in incidence and mortality rates of breast and gynecologic cancers according to the Human Development Index in the Pan-American region. *Public Health*. 2017; 149: 81-8. PMID: 28577441, DOI: 10.1016/j.puhe.2017.04.017
14. Arbyn M, Castellsagué X, de Sanjosé S, Bruni L, Saraiya M, Bray F, Ferlay J. Worldwide burden of cervical cancer in 2008. *Ann Oncol*. 2011; 22(12): 2675-86. PMID: 21471563, DOI: 10.1093/annonc/mdr015
15. Wu J, Liu X, Hua K, Hu C, Chen X, Lu X. Effect of nerve-sparing radical hysterectomy on bladder function recovery and quality of life in patients with cervical carcinoma. *Int J Gynecol Cancer*. 2010; 20(5): 905-9. PMID: 20606542, DOI: 10.1111/IGC.0b013e3181df99c0
16. Bumbu A, Nacer K, Bratu O, Berechet M, Bumbu G. Ureteral lesions in Gynecological pathology. Proceedings of The 14th National Congress of Urogynecology, Filodiritto Editore, 26-27 October, 2017.
17. Bretschneider CE, Doll KM, Bensen JT, Gehrig PA, Wu JM, Geller EJ. Prevalence of pelvic floor disorders in women with suspected gynecological malignancy: a survey-based study. *Int Urogynecol J*. 2016; 27(9): 1409-14. PMID: 26872646, DOI: 10.1007/s00192-016-2962-3
18. Steliarova-Foucher E, O'Callaghan M, Ferlay J, Masuyer E, Rosso S, Forman D, Bray F, Comber H. The European Cancer Observatory: A new data resource. *Eur J Cancer*. 2015; 51(9): 1131-43. PMID: 24569102, DOI: 10.1016/j.ejca.2014.01.027
19. Ferlay J, Steliarova-Foucher E, Lortet-Tieulent J, Rosso S, Coebergh JWW, Comber H, Forman D, Bray F. Cancer incidence and mortality patterns in Europe: estimates for 40 countries in 2012. *Eur J Cancer*. 2013; 49(6): 1374-403. PMID: 23485231, DOI: 10.1016/j.ejca.2012.12.027
20. Bray F, Ren JS, Masuyer E, Ferlay J. Global estimates of cancer prevalence for 27 sites in the adult population in 2008. *Int J Cancer*. 2013;

132(5): 1133-45. PMID: 22752881, DOI: 10.1002/ijc.27711

21. Siegel RL, Miller KD, Jemal A. Cancer statistics, 2016. *CA Cancer J Clin*. 2016; 66(1): 7-30. PMID: 26742998, DOI: 10.3322/caac.21332
22. Ramaseshan AS, Felton J, Roque D, Rao G, Shipper AG, Sanses TV. Pelvic floor disorders in women with gynecologic malignancies: A systematic review. *Int Urogynecol J*. 2017; 1-18. PMID: 28929201, DOI: 10.1007/s00192-017-3467-4
23. Constantin VD, Socea B, Popa F, Carâp AC, Popescu G, Vlădescu T, Ceauşu Z, Berteşteanu ŞV, Ceauşu MC. A histopathological and immunohistochemical approach of surgical emergencies of GIST. An interdisciplinary study. *Rom J Morphol Embryol*. 2014; 55(2 Suppl): 619-27. PMID: 25178335
24. Goff BA, Mandel LS, Drescher CW, Urban N, Gough S, Schurman KM, Patras J, Mahony BS, Andersen MR. Development of an ovarian cancer symptom index: Possibilities for earlier detection. *Cancer* 2007; 109(2): 221–7. PMID: 17154394, DOI: 10.1002/cncr.22371
25. Kim MK, Kim K, Kim SM, Kim JW, Park NH, Song YS, Kang SB. A hospital-based case-control study of identifying ovarian cancer using symptom index. *J Gynecol Oncol*. 2009; 20(4): 238–42. PMID: 20041101, DOI: 10.3802/jgo.2009.20.4.238
26. Nicolae AC, Drăgoi CM, Ceauşu I, Poalelungi C, Iliescu D, Arsene AL. Clinical implications of the indolergic system and oxidative stress in physiological gestational homeostasis. *Farmacia*. 2015; 63(1): 46-51.
27. Marcu D, Spînu D, Oprea I, Manea M, Pricop C, Cumpănaș A, Pahonțu E, Bodean O, Diaconu C, Bratu O. The Outcomes of Midurethral Sling Surgery in Women with Stress Urinary Incontinence. Proceedings of The 14th National Congress of Urogynecology, Filodiritto Editore Proceedings, 26-27 October, 2017.
28. Spînu D, Marcu D, Oprea I, Manea M, Cârstoiu M, Brătilă E, Mischianu D, Bratu O. Pain in urogynecologic surgery. Proceedings of The 14th National Congress of Urogynecology, Filodiritto Editore Proceedings, 26-27 October, 2017.
29. Rutledge TL, Heckman SR, Qualls C, Muller CY, Rogers RG. Pelvic floor disorders and sexual function in gynecologic cancer survivors: a cohort study. *Am J Obstet Gynecol*. 2010; 203(5): 514.e1-7. PMID: 20869691, DOI: 10.1016/j.ajog.2010.08.004
30. Manchana T, Prasartsakulchai C, Santingamkun A. Long-term lower urinary tract dysfunction after radical hysterectomy in patients with early postoperative voiding dysfunction. *Int Urogynecol J*. 2010; 21(1): 95-101. PMID: 19760355, DOI: 10.1007/s00192-009-0996-5
31. Hazewinkel MH, Sprangers M, Van der Velden J, Van der Vaart CH, Stalpers L, Burger M, Roovers J. Long-term cervical cancer survivors suffer from pelvic floor symptoms: a cross-sectional matched cohort study. *Gynecol Oncol*. 2010; 117(2): 281-6. PMID: 20170944, DOI: 10.1016/j.ygyno.2010.01.034
32. Ceccaroni M, Roviglione G, Spagnolo E, Casadio P, Clarizia R, Peiretti M, Aletti G. Pelvic dysfunctions and quality of life after nerve-sparing radical hysterectomy: a multicenter comparative study. *Anticancer Res*. 2012; 32(2): 581-8. PMID: 22287748
33. Naik R, Nwabinelli J, Mayne C, Nordin A, de Barros Lopes A, Monaghan JM, Hilton P. Prevalence and management of (non-fistulous) urinary incontinence in women following radical hysterectomy for early stage cervical cancer. *Eur J Gynaecol Oncol*. 2001; 22(1): 26-30. PMID: 11321489
34. Nosti PA, McDermott 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* 2012; 5(1): 27-30. DOI: 10.1016/j.cogc.2012.04.002
35. Bacalbașa N, Balescu I. Extended upper abdominal resections as part of debulking surgery at the time of tertiary cytoreduction for relapsed ovarian cancer; case report and literature review. *J Clin Invest Surg*. 2017; 2(2): 75-80. DOI: 10.25083/2559.5555.22.7580
36. Hampl M, Langkamp B, Lux J, Kueppers V, Janni W, Müller-Mattheis V. The risk of urinary incontinence after partial urethral resection in patients with anterior vulvar cancer. *Eur J Obstet Gynecol Reprod Biol*. 2011; 154(1): 108-12. PMID: 20884110, DOI: 10.1016/j.ejogrb.2010.08.018
37. Bălălău DO, Bacalbașa N, Stănescu AD. Cesarean scar defects and placental abnormalities; a 3 year survey study. *J Mind Med Sci*. 2017; 4(2): 156-162. DOI: 10.22543/7674.42.P156162

38. Moga MA, Dimienescu OG, Arvatescu CA, Mironescu A, Dracea L, Ples L. The Role of Natural Polyphenols in the Prevention and Treatment of Cervical Cancer-An Overview. *Molecules*. 2016; 21(8). pii: E1055. PMID: 27548122, DOI: 10.3390/molecules21081055
39. Bregendahl S, Emmertsen KJ, Lindegaard JC, Laurberg S. Urinary and sexual dysfunction in women after resection with and without preoperative radiotherapy for rectal cancer: a population-based cross-sectional study. *Colorectal Dis*. 2015; 17(1): 26-37. PMID: 25156386, DOI: 10.1111/codi.12758
40. Coady D, Kennedy V. Sexual health in women affected by cancer: focus on sexual pain. *Obstet Gynecol.* 2016; 128(4): 775-91. PMID: 27607852, DOI: 10.1097/AOG.0000000000001621
41. Lindau ST, Schumm LP, Laumann EO, Levinson W, O'muircheartaigh CA, Waite LJ. A study of sexuality and health among older adults in the United States. *N Engl J Med*. 2007; 357(8): 762-74. PMID: 17715410, DOI: 10.1056/NEJMoa067423
42. Lindgren A, Dunberger G, Enblom A. Experiences of incontinence and pelvic floor muscle training after gynaecologic cancer treatment. *Support Care Cancer*. 2017; 25(1): 157-66. PMID: 27596267, DOI: 10.100/s00520-016-3394-9