The article was received on February 2, 2021, and accepted for publishing on May 9, 2021.

ORIGINAL ARTICLES

Obesity impact on symptomatology associated with pelvic floor dysfunction

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Abstract: *The increasing incidence of obesity, a significant health problem worldwide, represents a major socio-economic burden with a high impact on the quality of life. It is considered a risk factor for multiple medical conditions. More than half of women from developed countries are overweight or obese, this comorbidity can affect them from puberty through the reproductive period and then in the menopausal period, involving multiple medical and surgical specialties. It has a significant impact on the onset of puberty, the menstrual cycle, ovulation, fertility rate, and pregnancy outcome. In postmenopausal women, obesity represents an important risk factor for breast cancer, endometrial cancers or polyps, fibroids, pelvic organ prolapse, or stress urinary incontinence in addition to a higher risk of post-operative complications and also to some types of fragility fractures, especially if diabetes mellitus is associated. Pelvic floor disorders include pelvic organ prolapse, urinary or fecal incontinence. Obese patients seem more affected compare with normal-weighted females. We introduce a single-center, retrospective study on 74 patients (admitted between 2016 and 2019) with pelvic organ prolapses that were referred for surgical correction, and further on they were evaluated after one month, respective after 6 months since procedure. On admission, the subjects, aged between 41-82 years (median of 57 years) showed a strong correlation between the symptomatology caused by the prolapse degree and obesity (40.54% of them), as it appears that the discomfort and symptoms are significantly higher in the women with higher body mass index. In the reevaluation form, the patients with obesity complaint more frequently compared to the non-obese females about urinary and colorectal distress and low sexual desire and interest. The use of surgical treatment for pelvic organ dysfunctions is a contributor to improved quality of life in adult obese females.*

Keywords: *pelvic organ prolapse dysfunction, obesity, prolapse degree, body mass index, menopause, reproductive age*

INTRODUCTION

Obesity is one of the most severe health issues in developed and developing countries contributing to more than 4 million deaths each year [1]. It is by far the most frequent comorbidity severe pathologies and represents a major socio-economic burden with a high impact on the quality of life because of the disease itself, associated conditions, and impair the outcome of apparently non-connected conditions like abdominal surgery or procedures for gynecological diseases [2]. Excessive weight in the female population of reproductive age interferes with puberty, menstrual cycle, ovulation, fertility rate, abortion rate, pregnancy outcome, perinatal complications, and increased risk of severe infections [3-6]. Also, it is a risk factor for endometrial cancer, breast cancer, and uterine fibroids [7, 8]. It might

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represent a poor prognosis factor in other malignancies like ovarian or color-rectal types [9, 10]. Most cases of obesity are associated with elements of metabolic syndrome like dyslipidemia, high blood pressure, and type 2 diabetes mellitus, also associating high serum uric acid, chronic inflammatory syndrome, anomalies of bone turnover markers, damage of coagulation profile, and mineral metabolism including hypovitaminosis D [11-14]. Obesity also may be secondary to endocrine tumors like adrenal – and pituitary neoplasia (for instance, Cushing syndrome, acromegaly, etc.), also associating anomalies of glucose profile, higher risk of some other tumors, poor wound healing, etc. [15]. Other causes of obesity and glucose profile anomalies are related to pancreatic tumors (somatostatinoma, glucagonoma, etc.) with heterogeneous manifestations [16-18]. Recently, obesity has been linked with a higher risk of fragility fractures, even though estrogens (including those derived from adipose tissue, not only of ovarian origin) are traditional elements of bone protection and that bone mineral density is directly correlated with body mass index [19, 20].

Pelvic floor dysfunction affects both females of reproductive age and post-menopausal, and it includes pelvic organ prolapse and urinary incontinence are significantly influenced by obesity [21]. Urinary incontinence is associated with increased intra-abdominal pressure caused by central obesity and is related to the period that women had had excessive weight [22]. Systematic studies regarding the effect of obesity on urinary incontinence and the results of surgery on this pathology showed that one of the main causes of decreased surgery effectiveness is represented by excessive weight [23,24].

Similarly, many studies had found a higher prevalence of pelvic organ prolapse among women with excessive weight especially morbidly obese and severely obese patients [25]. Unfortunately, the tissue damage from the pelvic floor caused by excessive weight is irreversible, as the cystocele, rectocele, or uterine prolapse does not reduce after weight loss [26]. Pelvic organ prolapse progresses with aging and has a low progression rate after menopause [27]. Some authors consider that the incidence of pelvic disorders will increase by 46% by 2050 [28].

Several surgical treatments for pelvic organ prolapse and stress urinary incontinence are known but many variables can influence the outcome. These are represented by prolapse degree, symptomatology, lifestyle, age, body mass index, sexual activity. This type of pathology, the treatment required, and the correlated risk factors have an important impact on the quality of life.

Obesity is particular comorbidity that is found in many patients with pelvic floor disorders. Obese patients can associate severe life-threatening pathologies but in the meantime, they can present sexual dysfunctions, pelvic organ prolapse, modified bowel movement, or urinary incontinence [29]. Pelvic floor dysfunctions are correlated by themselves with poor quality of life, modified bowel movement, modified urinary pattern, or sexual dysfunction. Obesity is correlated with an increased risk of urinary incontinence between 20 and 70% proportional with the body mass index [30]. Urinary stress incontinence is, without doubt, more frequent in obese women and it is demonstrated that bodyweight loss will lead to decreasing in the number of episodes [31, 32]. In the literature are reported studies in which up to 40% of patients admitted for pelvic organ prolapse presented with a high body mass index [33, 34]. Persisting and progressive obesity were associated with progressing prolapse degree but weight loss was not associated with significant improvement of the prolapse degree [35].

Studies have shown that obesity influences postoperative evolution. A poor outcome with anatomical and functional failure after surgery was associated with obesity, multiple vaginal deliveries, and the intensity of the symptoms before surgery [36].

MATERIALS AND METHODS

This study aimed to evaluate the influence of obesity on women with pelvic floor dysfunction that underwent surgery in our clinic between January 2016 and December 2019. It was designed as a retrospective study in women with pelvic organ prolapses who had clinical post-operative follow-up at 1 month and 6 months. The patient data collected included age, body mass index, number of births, hormonal status. The patients agreed to anonymously use their medical data during hospitalization for surgical procedures and during follow-up.

The pelvic floor disorder was evaluated before intervention for every patient with the Pelvic Floor Impact Questionnaire (PFIQ 7) which evaluates three aspects: Urinary Impact (UIQ-7), Colorectal-Anal Impact (CRAIQ-7), and Pelvic Organ Prolapse Impact (POPIQ-7) and with Pelvic Floor Distress Inventory-20 (PFDI-20) [19]. The women responded to the questionnaire in the presence of the medical team and the responses were corroborated with the patient's history.

RESULTS

There were evaluated 74 patients that underwent surgery and had completed the questionnaires before the

procedure. We included all 74 women aged between 41 and 82 years with a median of 57 years to participate in this study. Most of the patients were above 50 years at the moment of surgery (70.27%) and only 29.73% under 50 years. Only 6 of the 74 patients were nulliparous, 27 had one child and 33 had 2 children. Only 8 patients had more than 3 children. The majority of the women had one or two children (44 patients). Of these women, 59.46% had a body mass index lower than 30 and 40.54% were obese with a body mass index higher than 30. The majority of women reached menopause (48 patients), of which 30 were non-obese. Stage I and II pelvic organ prolapse was presented in 26.67% of the obese patient and 56.81% of the non-obese patients. Stage III and IV were present in 73.33% of the obese women and 43.18% of the non-obese women. The mean body mass index for patients with pelvic organ prolapse III or IV was 30.95 (±0.83) in obese patients and 25.64 (±1.96) in non-obese patients. The demographic data are presented in Table 1.

Table 1: Demographic data

	Non-obese n=44	**Obese n=30**
Age	40 – 77 (mean 59)	41 – 82 (mean 52.5)
IMC	20.65 – 29.39 (mean 25.33)	30.07 – 33.26(mean 30.83)
Menopause	30	18
Parity - nulliparous - 1 birth - 2 births - 3 and more than 3 birts	 4 17 19 4	 2 10 14 4
Pelvic organ prolapse - I or II - III or IV	 25 19	 8 22

The symptomatology was evaluated with PFIQ-7, PFDI-20, and FSFI for sexual life evaluation. A high result in PFIQ-7 and PFDI-20 represents an increased discomfort (scales 0 to 300). These patients also have poorer sexual function. For the PFIQ-7 the mean value was 191.73 (±60.00) for obese women and 152.72 (±69.16) for non-obese women (p = 0.0034, t = 3.0248, df = 72). The PFDI-20 the mean value was 192.5 (±43.12) for obese women and 156.84 (±64.33) for non-obese women (p = 0.0097, t = 2.6535, df = 72). These values suggest a strong correlation in our patients between the symptomatology caused by the prolapse degree and obesity, as it appears that the discomfort and symptoms are significantly higher in women with higher body mass index. Women with high scores on PFQI and PFDI had high scores on sexual function FSFI. Sexual desire and interest were low on 56%, sexual arousal reduced by 61% and 71% reached orgasm less than half of the time or rarely. The data collected is shown in Table 2.

Table 2: Pelvic Floor Distress Inventory-20 and Pelvic Floor Impact Questionnaire – scores in obese and non-obese patients

Variable	**Non-obese (n=44)**	**Obese (n=30)**	**P value**
PFIQ-7	Mean = 152.72 S.D.=69.16	Mean = 191.73 S.D.=60.00	p = 0.0034 t = 3.0248 df = 72
PFDI-20	Mean = 156.84 S.D.=64.33	Mean = 192.5 S.D.=43.12	p = 0.0097 t = 2.6535 df = 72
Prolapse degree	I-II = 25 III-IV= 19	I-II = 8 III-IV= 22	

PFIQ = Pelvic Floor Impact Questionnaire (scale 0-300)
PFDI = Pelvic Floor Distress Inventory (scale 0 -300)

The 74 women were evaluated 1 month after surgery, with a period of 4-6 weeks of sexual abstinence. The reevaluation was realized 6 months after surgery. At the reevaluation, the patients with obesity (30%) complaint more frequently compared to the non-obese females (18%) about urinary and colorectal distress and low sexual desire and interest.

There was 55.41 % with high pelvic organ prolapse degree (III or IV), from which most were women with body mass index above 30 (22 patients, compared to 19 non-obese patients). The high pelvic organ prolapse degree does not correlate with the body mass index (p=3.7, df =39).

DISCUSSION

The prevalence of obesity in developed and developing countries is continuously increasing. Although it can be managed with many options, it remains one of the most difficult comorbidity to correct. In our study, obesity was not correlated with stage III or IV prolapse, but pelvic floor symptoms were associated with a body mass index higher than 30.

The literature that evaluates the association between pelvic floor symptoms and obesity contains various results. The main cause of different results can result from the methodology of symptoms evaluation and defining the prolapse degree. In our study, one of the limits is represented by the small lot of patients that reduces the power of the study.

Hendrix et all [34] included in their study 16,616 women, from which 14.2 had uterine prolapse, 34.4% cystocele, and 18.6% rectocele, and found a strong association between this pathology and parity and obesity. Whitcomb et al [37, 38] enrolled 1,155 women in their study and concluded that the prevalence of any type of pelvic organ dysfunction was

highest in morbidly and severely obese patients (57% and 53%) compared to obese women (44%), but the degree of discomfort was not influenced by the degree of obesity. Another large study [26] that included 16,608 patients concluded that obesity is associated with the progression of the pelvic organ prolapse and the damage might be irreversible. Both obesity and pelvic floor dysfunctions are associated with low quality of life.

CONCLUSIONS

Although the data can be conflicting, the practitioner must evaluate the patient and discuss the optimal approach to obesity-related complications. Managing obesity, even if it is not always a priority, it must be taken into consideration. Results take time, but in correlation with surgical treatment of pelvic organ dysfunctions, the overall quality of life of these patients will be significantly improved.

Acknowledgments

Not applicable.

Funding: No funding was received.

Authors' contribution:

MCD drafted the manuscript and critically revised the final form, AEN is the corresponding author and revised the literature, NA researched the literature, AMO critically revised the manuscript, AP drafted the manuscript and revived the references, CGN researched the literature and approved the final form. All authors read and approved the final manuscript.

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Ethics approval and consent to participate:

For this study, the agreement was obtained from the Ethics Committee. The subject data were completely confidential and they approved the publication of data.

Patient consent for publication: All patients consented that the data declared could be used for educational purposes and statistical studies.

Competing interests:

The authors declare that they have no competing interests.

Availability of data and materials:

The information generated and analyzed during the current study is available from the corresponding author on reasonable request.

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