An evaluation of pelvic organ prolapses in perimenopausal and menopausal Chinese females

J.-F. SHI[1], W.-Z. XU[2], H.-F. WANG[1], W.-K. TAO[1], Y.-X. REN[1], T. ZHANG[1], X. YU[3]

[1]Department of Obstetrics and Gynecology, Dali University, Dali, Yunnan, China
[2]Department of Obstetrics and Gynecology, The Second People's Hospital of Liaocheng, Liaocheng, China
[3]Pre-clinical College, Dali University, Dali, Yunnan, China

Abstract. – **OBJECTIVE:** The aim of the study was to evaluate the prevalence of pelvic organ prolapse (POP) and correlate the various factors including, but not limited to, educational status, socio-economic condition, body mass index (BMI), menstrual history, with the status and severity of POP.

PATIENTS AND METHODS: A retrospective cross-sectional study was conducted between August 2021 and September 2022 and suspected patients of POP were considered from the outpatient Department of Gynecology and Obstetrics. The study has mainly used 3 indicators of socio-economic status, namely, occupation, education, and income. These factors were correlated and statistically analyzed with that of POP.

RESULTS: The study findings revealed that there are more symptomatic patients who are illiterate as compared to asymptomatic POP and with increasing education status, there is a decrease in symptomatic POP patients ($p<0.05$). Also, there is a significant proportion of symptomatic POP patients in the lower class and lower middle class as compared to asymptomatic patients in each class, respectively ($p<0.05$). It also found that micturition difficulty and vaginal bulging are significantly correlated with the stages of POP ($p<0.05$).

CONCLUSIONS: Educational status and socio-economic condition are significant indicators of the presence of symptoms or severity of POP. The study further concluded that menopausal females have more symptomatic POP as compared to pre-menopausal females.

Key Words:
    Pelvic organ, Prolapse, Menopausal, Peri-menopausal.

Introduction

Pelvic organ prolapse (POP) is the result of the bladder, uterus, rectum, and/or small intestine being improperly placed inside or outside of the vagina and the fibromuscular supports of the pelvic organs weakening or failing[1]. It is a condition in females that typically manifests as a combination of the abovementioned and can affect the anterior vaginal wall, posterior vaginal wall, uterus, or vaginal apex[2]. Growing older has been identified[3] as a definite risk factor for POP. According to estimates, China's senior female population (65 years and older) will double by 2040 compared to levels in 2020.

Bulging out of one or two pelvic structures, vaginal bulge, irregular urination and defecation, vulvar bleeding, and inflammation are the main symptoms of POP. All these symptoms have a different impact on the patient's quality of life. With a 40% incidence rate in the Netherlands, POP is highly frequent in middle-aged and older women, but only 12% of them experience pain symptoms[3].

Pelvic organ prolapses, which includes anterior compartment prolapse, posterior compartment prolapses, and enterocele, is the herniation of the pelvic organs to or beyond the vaginal walls. Three to six percent of the women who underwent routine gynecologic examinations and had POP had descended beyond the hymen[4-6]. The Women's Health Initiative estimates that 41% of postmenopausal women have some degree of POP, which is extremely frequent among geriatric women. POP is closely correlated with advanced age; thus, by 2050 in the USA, there will be a 46% increase in the proportion of women who have POP[7].

A pelvic support system has three levels. Figure 1 shows the detailed anatomy of pelvic support system.

Level 1: The uterus and vaginal vault are apically attached to the bony sacrum by the cardinal-uterosacral ligament complex. The cardinal-uterosacral ligament complex fractures or attenuates, which results in uterine prolapse[8].

Level 2: The fascia covering the levator ani muscles and the arcus tendinous fascia of the pelvis support the middle portion of the vagina[7,8].

Level 3: The lower portion of the vagina is supported by the urogenital diaphragm and the perineal body[8].

Corresponding Author: Jifang Shi, MD; e-mail: fcksjf@outlook.com
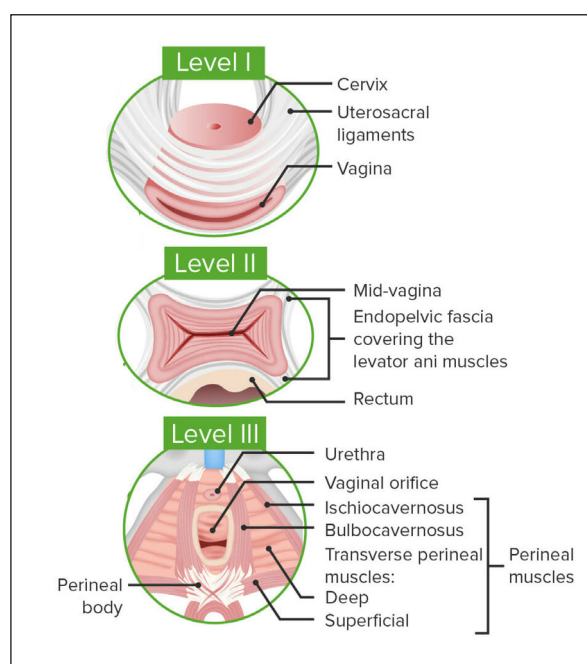
Figure 1. Three levels of pelvic support system.

For any stage or location of POP, a supportive or space-occupying vaginal device may be utilized to lessen prolapse inside the vagina, support the pelvic tissues, and relieve pressure on the bladder and bowel. The main treatments for POP have traditionally included vaginal or trans-abdominal hysterectomy, as well as vaginal anterior and posterior wall repair. In many cases, lack of sexual intercourse, absent uterine prolapse, vaginal atrophy associated with lower level of estradiol make the vaginal approach of hysterectomy more difficult. In that cases, laparoscopic approach is adopted[7,8]. To preserve fertility for increasing quality of life, fertility preserving approach like uterine transplantation are considered in patients with early staged or low staged endometrial cancers. But in many cases, it has been that this fertility sparing treatment leads to POP[8]. However, non-mesh repairs like corpectomy or Trans vaginal hysterectomy with or without anterior and/or posterior colporrhaphy have a 29% to 30% recurrence rate. Transvaginal mesh has recently been made available for pelvic floor repair surgery. Transvaginal mesh benefits include maintaining the uterus, having little invasiveness, having low recurrence rates, and restoring the pelvic floor's anatomical integrity. However, various flaws have come to light over time, and the most frequent issues include mesh erosion, pelvic pain, and discomfort during sexual activity[9].

A universal physiological time for women, menopause is marked by a fall in ovarian hormone secretions and is associated with several disorders and symptoms, including vasomotor symptoms, psychiatric symptoms, urogenital symptoms, etc. In addition, postmenopausal women may develop cardiovascular disease, diabetes, osteoporosis, lipid metabolism issues, and other illnesses as a result of menopause[10-12].

However, according to reports, the number of senior people in the world would rise from 5.8 million in 1998 to 20 million in 2050, making up 35% of the overall population[11]. In many nations, the ageing population has already caused a sizable number of issues. The reproductive health of the older population is one of the primary issues. However, given the average lifespan, women may live for a third or even half of their lives following menopause. To enhance their quality of life and prevent degenerative disorders, perimenopausal and postmenopausal women's health needs to be given more consideration[13-15].

Menopausal symptoms in middle-aged Chinese women are frequently misdiagnosed as signs of ageing naturally rather than illnesses. Only 20.20% of women experiencing menopausal symptoms sought medical advice or treatment, according to research[14,15]. Many women who need treatment have little information about menopause, which adds to the burden on families and society as well as the emergence of far more serious health problems such as genitourinary illnesses, osteoporosis, and cardiovascular disease. There is an urgent need for an improved social services system, which should include health counselling and specific management for perimenopausal and postmenopausal women[16,17].

The condition might then spread more widely, leading to problems with both health care and finances[15]. A large-scale observational study is required to establish the actual prevalence and to ascertain the course of the disorder in the general population to allocate resources to the growing number of patients with this condition and to develop strategies to treat patients suffering from this condition[16].

In China, there have not been many epidemiological studies on POP. The correct estimation of the prevalence of POP in a comprehensive epidemiology survey is significantly hampered by a physical examination that evaluates vaginal support. Numerous studies[17,18] have employed numerous reporting systems, but physical examinations have been infrequently included. Because

identifying risk factors can facilitate counselling and prevention in women who are at risk for developing POP, standardized criteria must be devised. This includes the implementation of a specific prolapse grading system that correlates with symptom burden ratings[18]. POP therapy is an optional procedure. By lessening the burden of symptomatic POP, it seeks to improve the quality of life. Consideration of patient choices for treatment is even more crucial given the very nature of this extremely difficult ailment. Therefore, it is crucial to examine global epidemiological statistics on the prevalence of symptomatic POP[18,19].

Patients and Methods

Study Design

A retrospective cross-sectional study was conducted in our hospital's Gynecology and Obstetrics department, between August 2021 and September 2022. Of all the patients visiting the gynecology department those females both menopausal and perimenopausal diagnosed with pelvic organ prolapse (POP) were considered in this study. This current study considered 120 patients. A detailed medical history of these patients was taken, examined and diagnosed. Pelvic organ prolapse quantification (POP-Q) was used in the examination of these patients. The females were identified as symptomatic of POP if they are presenting with any of these symptoms of prolapse like vaginal bulging, difficulty in defecation, and micturition, and females asymptomatic of POP were identified if they are presenting with any other gynecological symptoms like contraception, vaginal discharge, endometriosis, and amenorrhea. Of all the patients examined 200 females were included in the study. The study has used 3 indicators of socio-economic status, namely, occupation, education and income[16,18]. The Asian Pacific Perspective for Asians WHO IOTF 2003 was used for categorizing the BMI of the subjects[15,16].

Inclusion and Exclusion Criteria

Females over 40 years old, who visited the hospital's outpatient department, who were menopausal or perimenopausal, completed the study protocol, and provided informed consent were included in the study. Women with suspected pelvic organ prolapse were also included, as were those who had additional gynecological problems such as endometriosis, abnormal uterine bleeding (AUB), vaginal discharge, or were asymptomatic to POP.

Females who did not follow the study protocol, did not finish it, or did not provide consent were not included in the study. The study also excluded pregnant women, and females with a history of cesarean sections, hysterectomies, and pelvic operations.

Ethical Approval

The patients were given a thorough explanation of the study before the data collection. The study obtained the required consent from each patient. The study process was approved by the Ethical Committee of the hospital. The study was conducted according to the Declaration of Helsinki (World Medical Association).

Statistical Analysis

The study used SPSS 25 (IBM Corp., Armonk, NY, USA) and MS Excel for efficient statistical analysis. The descriptive data have been expressed as mean±standard deviation. The categorical data have been expressed as absolute counts and percentages. The study used ANOVA for continuous variables and Chi-Square for categorical variables. The level of significance was considered to be $\alpha=0.05$.

Results

The study has found the baseline characteristics of the whole sample. It was found that the age of patients in this study was 48.52±8.66 years old and BMI was found to be 25.24±3.11 kg/m^2. Table I shows the detailed baseline characteristics of the study sample.

The study found that 78.82% of the population of all symptomatic patients are illiterate, while 57.4% of asymptomatic patients were illiterate. The study findings revealed that there are more symptomatic patients, who are illiterate as compared to asymptomatic POP and with increasing education status, there is a decrease in symptomatic POP patients ($p<0.05$). Again, it is found that 12.9% of symptomatic patients and 14.2% of asymptomatic patients are of lower-middle class while 87% of symptomatic and 85.71% of asymptomatic patients are from lower socio-economic class. Hence, there is a significant proportion of symptomatic POP patients in the lower class and lower middle class as compared to asymptomatic patients in each class, respectively ($p<0.05$). Again, it has been revealed that 52.94% of symptomatic and 31.42% of asymptomatic patients are obese. Of all the asymptomatic patients 62.85%

Table I. Baseline characteristics of women with POP according to socio-demographic distribution.

Characteristics	Value
Age (years, mean±standard deviation)	48.52±8.66
BMI (kg/m^2, mean±standard deviation)	27.24±4.11
Occupation	
Homemaker, n (%)	102 (85)
Heavy worker, n (%)	13 (10.83)
Lightworker, n (%)	5 (4.1)
Menstrual status	
Pre-menopause, n (%)	58 (48.33)
Menopause, n (%)	62 (51.66)

and 37.14% are pre-menopause and menopause, respectively. Among symptomatic patients, 42.35% and 57.64% are pre-menopause and menopause respectively. Most of the symptomatic (85.88%) and asymptomatic (68.57%) have undergone home deliveries. Symptomatic POP is seen more in females with four children (44.7%) and asymptomatic POP is seen more in females with three children (34.28%), although it is not found to be significant. Table II shows the various factors of asymptomatic and symptomatic POP and their significance.

This study found that vaginal bulging is more common in stage 2 (90.32%) followed by stage 3 (86.36%) and stage 1 (20.89%). 17.91% of individuals are affected in stage 1 with difficulty in micturition, 41.93% in stage 2, and 50% in stage 3. The difficulty in defecation is seen in 28.35% of stage 1, 29.03% of stage 2, and 36.36% of stage 3. Table III compares the various phases of POP and reveals that micturition difficulty and vaginal bulging are significantly correlated with the stages of POP ($p<0.05$).

Table II. Factors associated with asymptomatic and symptomatic population.

Variables	Symptomatic POP (n=85)	Asymptomatic POP (n=35)	*p*-value*
Educational status			
Illiterate	67 (78.82%)	18 (57.4%)	
Primary	10 (11.7%)	6 (17.1%)	$p<0.05$
Upper primary and higher	8 (9.4%)	11 (31.4%)	
Socio-economic condition			
Lower middle class	11 (12.9%)	5 (14.2%)	
Lower class	74 (87%)	30 (85.7%)	$p<0.05$
BMI category (kg/m^2)			
Normal weight	27 (31.7%)	18 (51.4%)	
Overweight	13 (15.2%)	6 (17%)	$p>0.05$
Obese	45 (52.94%)	11 (31.42%)	
Menstrual history			
Pre-menopause	36 (42.35%)	22 (62.8%)	
Menopause	49 (57.64%)	13 (37.1%)	$p<0.05$
Resumption of work			
Early	52 (61%)	24 (68.5%)	
Late	33 (38.8%)	11 (31.4%)	$p>0.05$
Parity			
One	6 (7%)	5 (14.2%)	
Two	16 (18.8%)	10 (28.5%)	
Three	25 (29.4%)	12 (34.2%)	$p>0.05$
Four	38 (44.7%)	8 (22.8%)	
Place of labor			
Hospital	12 (14.1%)	11 (31.4%)	
Home	73 (85.8%)	24 (68.5%)	$p>0.05$

*Significance between symptomatic and asymptomatic patients.

Table III. Clinical features found in different stages of POP.

Clinical features	Stage 1 n=67	Stage 2 n=31	Stage 3 n=22	*p*-value
Vaginal bulging, n (%)	14 (20.89)	28 (90.32)	19 (86.36)	*p*<0.05
Difficulty in micturition, n (%)	12 (17.91)	13 (41.93)	11 (50)	*p*<0.05
Difficulty in defecation, n (%)	19 (28.35)	9 (29.03)	8 (36.36)	*p*>0.05

Discussion

Women who are menopausal or in the perimenopausal stage may experience prolapse. The average age of women with prolapse in the Pooja and Abhijit[20] studies was 52.20 years, compared to 58.80 years in the Burrows et al[19] study and 44 years in the Swift et al[5] study. Having symptoms at such a young age may be related to Indian traditions that encourage early marriage and frequent, unplanned pregnancies with short intervals between births. In the Pooja and Abhijit[20] studies, 72.34% of the women were post-menopausal whereas the remaining women were pre-menopausal. In Burrows et al[19] study, 75% of the participants were postmenopausal and 25% were premenopausal.

Past evidence shows that 86 (57.3%) of the 150 POP women had symptoms, whereas 64 (42.7%) did not, however they still displayed other gynecological symptoms. Depending on their objectives and concerns, patients' clinical presentations may change[15,16]. In women with mild to moderate prolapse, symptoms relating to the pelvic floor do not predict the anatomic site of the prolapse[21]. In another study[16], the distribution of variables in the asymptomatic POP group in terms of socioeconomic circumstances, return to work following delivery, and place of delivery followed a similar pattern to the distribution in subgroups with symptomatic POP. In our current study, we also found that 87% of the symptomatic patients were from the lower-class condition while 85.7% of the asymptomatic patients were from the lower class.

The majorities of the women in the asymptomatic POP group were premenopausal and had normal body weights, but the symptomatic POP group's female members frequently had menopause and obesity. For prolapse symptoms, obesity appears to be a risk factor[22]. A BMI over 25 and the use of forceps during delivery were linked to increased POP, according to a study by Glazener et al[23]. Contrary to this, the current study did not find any significant relationship between BMI and the presence of symptoms. Although our current study has shown that more than half of the symptomatic patients had obesity which accounted for 52.94% and again, more than half of the asymptomatic patients (51.4%) had normal weight.

In this study, 57.64% of the patients were menopausal among symptomatic patients and 37.1% of the asymptomatic patients were menopausal. In a Burrows et al[19] study, 75% of the participants were menopausal and 25% were pre-menopausal. In contrast, a different study[25] indicated that the majority of patients (62.5%) were pre-menopausal and that 37.5% were menopausal.

Stage 1 POP was more prevalent in pre-menopausal women in our study than stage 2, 3 and stage IV POP, which were more prevalent in menopausal women[18]. Thus, it may be concluded that menopause is linked to advanced or higher stages of prolapse and that this association is very important to the current study[17,19]. The proportion of all prolapse stages was higher in the 41-50 age group than in the over 50 age group, and the difference in the current study was extremely significant, showing that the disease is developing after vaginal delivery and POP can be detected at a young age. In a study by Ansari et al[25], it was discovered that as people age, the prevalence of the POP stage rises. Age is not a risk factor for symptomatic POP as demonstrated by Gyhagen et al[24] in their study.

In conclusion, menopausal and perimenopausal women who deliver vaginally frequently experience symptomatic or asymptomatic POP. More people between the ages of 41 and 50 years than those above 50 years were in all levels of POP. The degree of POP can be predicted by age. Menopause is linked to the severity of prolapse and was typically symptomatic in these cases. According to the published Ansari et al[25] study anterior vaginal wall prolapse was the most prevalent, followed by posterior vaginal wall prolapse.

In a descriptive sample of postmenopausal Chinese women, Li et al[26] conducted a study to determine the prevalence and risk factors for symptomatic POP. In the multivariate analysis,

women who were between the ages of 50 and 70 years were more likely than those who were between the ages of 40 and 49 years to have symptomatic POP[23,24]. Having given birth twice or three times or more was substantially linked to POP symptoms. Overweight and obese women have a higher risk of POP compared to women of normal weight. Additionally linked to symptomatic POP were living in an urban location, smoking, drinking alcohol, coughing, constipation, mental labor, physical illness, and gynecological disorders[25].

The frequency of POP overall following menopause varies considerably between studies. Our study found a substantially higher prevalence of symptomatic prolapse (13.57%) than the national average (3-4.1%) (at greater than 60 years of age). Growth in the socioeconomic sphere also contributed to the variations in POP prevalence[25,26]. More money is spent on public health in industrialized nations than in developing or underdeveloped nations. As a result, industrialized nations like the USA and South Korea have substantially lower POP prevalence rates than developing and underdeveloped nations[26]. Postmenopausal females had a higher prevalence of symptomatic POP than those who were premenopausal. Additionally, there was a progressively rising trend in the prevalence of symptomatic POP following menopause as people aged. This was in line with earlier research conducted on the general populace. Additionally, postmenopausal females living in rural locations have a low likelihood of developing symptomatic POP[26].

Vaginal childbirth, getting older, and a higher BMI are the most often cited risk factors for POP, while many other factors have also been proposed[25]. After menopause, the incidence of symptomatic POP increased with age. Women aged 50 to 59 years had an adjusted risk ratio of 1.32 compared to those aged 40 to 49 years, while women over the age of 70 had an adjusted risk ratio of 1.82. According to a previous study[27] done in the USA, the likelihood of having POP rose by a decade with age.

Following menopause, obese women had a higher risk of POP, which was consistent with the trend for the general population that was noted in the literature. According to the Myers[28] study on prolapse symptoms in obese and overweight women, 37% of the patients acknowledged having prolapse symptoms. The meta-analysis risk ratio for women in the overweight category varied from 1.36 to 1.40, when compared to women in the normal weight category. Similar to men, the risk ratios for obese women in meta-analyses ranged from 1.47 to 1.61[29].

It has also been suggested that increased parity significantly influences the occurrence of POP. According to Handa et al[30], a CS was more protective than an unplanned or surgical vaginal delivery. Being multiparous (parity>3) raised the risk of symptomatic POP by 1.38 times, while having a CS had a protective impact on the risk of symptomatic POP by 0.55 times, which is consistent with other investigations of the general population[28-30].

In China, postmenopausal women have a roughly 15% prevalence of symptomatic POP. The prevalence of symptomatic POP is increasing with age, BMI, parity, smoking, alcohol use, cough, constipation, mental labor, physical illness, and gynecological illnesses, although all of these factors are modifiable[28,29]. To reduce the risk of developing symptomatic POP, efforts should be increased to promote access to family planning, manage weight, prevent persistent cough, and avoid constipation. Interventions aimed at reducing these risk factors are thus urgently required to stop POP[30].

There were 55,477 women in the most recent nationwide epidemiological study. 9.6% of POP cases were symptomatic[25]. The most typical stage of POP-Q was symptomatic POP-Q stage 2 (7.52%), which largely featured anterior compartment prolapse. A minor/moderate burden of symptomatic POP was the most prevalent, with a prevalence of 9.7%. The symptoms of the urinary system were more likely to be considered troublesome. The likelihood of each form of symptomatic POP rose with age and with multiple vaginal deliveries[18,24,26].

Prolapse was 15 times more common in multiparous women with eight or more deliveries than in nulliparous women[27]. After correcting for domicile, race, employment, marital status, and economic variables, we discovered that older age, particular lifestyle factors, pathological conditions, and numerous vaginal births increased the risks of each type of symptomatic POP, in line with previous studies[28]. The correlation between age and pelvic floor issues is typically linked to co-morbidities such as obesity, lung illness, and diabetes, which are more prevalent in older adults, as well as age-related alterations in connective tissue and neuromuscular function[18,29]. The study is limited by the number of patients and the variation within the

population. As this is a single-centered study, there is a lack of variation within the population. The study also did not consider co-morbidities or risk factors of POP. Therefore, the results cannot be reflected in the patients with significant risk factors of POP.

Conclusions

The study has concluded that symptomatic POP is more prevalent among less education and illiterate patients ($p<0.05$). Also, the lower class and lower middle class have a greater number of symptomatic patients as compared to the asymptomatic ones ($p<0.05$). The study further added that the resumption of work, parity, and place of delivery is not significant concerning the symptomatic and asymptomatic POP ($p>0.05$). Therefore, it can be concluded that educational status and socio-economic condition are significant indicators of the presence of symptoms or severity of POP. The study further concluded that menopausal females have more symptomatic POP as compared to pre-menopausal females ($p<0.05$). The authors also suggest conducting more similar studies with a more varied population. However, this current study has brought forward important basic characteristics of POP, which will be clinically significant during the management of the individual patient.

Conflict of Interest
The authors declare that there is no potential conflict of interest.

Ethics Approval
The study was approved by the Ethical Committee of Dali University.

Informed Consent
The study process was clearly explained to each patient. The signed consent was obtained from each patient before their participation.

Authors' Contributions
We declare that this work was done by the authors named in this article, and the authors will bear all liabilities claims relating to the content of this article.

References

1) Swift S, Woodman P, O'Boyle A, Kahn M, Valley M, Bland D. Pelvic Organ Support Study (POST): the distribution, clinical definition, and epidemiologic condition of pelvic organ support defects. Am J Obstet Gynecol 2005; 192: 795-806.

2) Jelovsek JE, Maher C, Barber MD. Pelvic organ prolapse. Lancet 2007; 369: 1027-1038.

3) World Population Prospects: the 2019 revision. New York: United. Nations, Department of Economic and Social Affairs. Pop Div 2019; 11: 12-19.

4) Ellerkmann RM, Cundiff GW, Melick CF, Nihira MA, Leffler K, Bent AE. Correlation of symptoms with location and severity of pelvic organ prolapse. Am J Obstet Gynecol 2001; 185: 1332-1337.

5) Swift SE. The distribution of pelvic organ support in a population of female subjects seen for routine gynecologic health care. Am J Obstet Gynecol 2000; 183: 277-285.

6) Trowbridge ER, Fultz NH, Patel DA, DeLancey JO, Fenner DE. Distribution of pelvic organ support measures in a population-based sample of middle-aged, community-dwelling African American and white women in southeastern Michigan. Am J Obstet Gynecol 2008; 198: 548-556.

7) Laganà AS, Garzon S, Raffaelli R, Gullo G and Franchi M. Robotic Surgery in Female-To-Male Transition: A Possible Way for Further Improvement. J Inv Surg 2019; 34: 651-652.

8) Mutlu L, Manavella DD, Gullo G, McNamara B, Santin AD, Patrizio P. Endometrial Cancer in Reproductive Age: Fertility-Sparing Approach and Reproductive Outcomes. Cancers 2022; 14: 215-232.

9) Ouyang Y, Chen R, Chu L, Liang J, Zhang X, Li L, Gao T, Li H, Tong X. Safety, and efficacy of a self-developed Chinese pelvic repair system and Avaulta repair system for the treatment of pelvic organ prolapse in women: A multicenter, prospective, randomized, parallel-group study. Med 2020; 99: 223-232.

10) Bromberger JT, Schott LL, Kravitz HM, Sowers M, Avis NE, Gold EB, Randolph JF, Matthews KA. Longitudinal change in reproductive hormones and depressive symptoms across the menopausal transition: results from the Study of Women's Health Across the Nation (SWAN). Arch Gen Psychiatry 2010; 67: 598-607.

11) Freeman EW, Grisso JA, Berlin J, Sammel M, Garcia-Espana B, Hollander L. Symptom reports from a cohort of African American and white women in the late reproductive years. Menopause 2001; 8: 33-42.

12) Hollander LE, Freeman EW, Sammel MD, Berlin JA, Grisso JA, Battistini M. Sleep quality, estradiol levels, and behavioral factors in late reproductive age women. Obstet Gynecol 2001; 98: 391-397.

13) Lee CG, Carr MC, Murdoch SJ, Mitchell E, Woods NF, Wener MH, Chandler WL, Boyko EJ, Brunzell JD. Adipokines, inflammation, and visceral adiposity across the menopausal transition: a prospective study. J Clin Endocrinol Metab 2009; 94: 1104-1110.

14) Gullo G, Etrusco A, Fabio M, Cucinella G, Rossi C, Billone V. The reproductive potential of uterus transplantation: future prospects. Acta Biomed 2022; 93: 202-213.

15) Matthews KA, Crawford SL, Chae CU, Everson-Rose SA, Sowers MF, Sternfeld B, Sutton-Tyrrell K. Are changes in cardiovascular disease risk factors in midlife women due to chronological aging or to the menopausal transition. J Am Coll Cardiol 2009; 54: 2366-2373.

16) Neer RM. SWAN Investigators. Bone loss across the menopausal transition. Ann N Y Acad Sci 2010; 1192: 66-71.

17) Yin H, Ye J, Gao H, Li Q, Tian Q, Wang W, Di W. Knowledge, attitude, and practice about reproductive health of perimenopausal and postmenopausal women in Shanghai: a cross-sectional and intervention study. Int J Clin Exp 2017; 10: 44-51.

18) Pang H, Zhang L, Han S, Li Z, Gong J, Liu Q, Liu X, Wang J, Xia Z, Lang J, Xu T. A nationwide population-based survey on the prevalence and risk factors of symptomatic pelvic organ prolapse in adult women in China – a pelvic organ prolapse quantification system-based study. BJOG 2021; 128: 1313-1323.

19) Burrows A, Lara J, Meyn, Leslie A. Pelvic Symptoms in Women with Pelvic Organ Prolapse. Am J Obstet Gynecol 2004; 104: 982-988.

20) Pooja P, Abhijit P. Evaluation of pelvic organ prolapse in Indian females. J Evol Med Dent Sci 2013; 40: 7612-7620.

21) Miedel A, Tegerstedt G, Maehle-Schmidt M. Symptoms, and pelvic support defects in specific compartments. Obstet Gynecol 2008; 112: 851-858.

22) Myers DL, Sung VW, Richter HE. Prolapse symptoms in overweight and obese women before and after weight loss. Med Reconstr Surg 2012; 18: 55-59.

23) Glazener C, Elders A, Macarthur C. Childbirth and prolapse: long-term associations with the symptoms and objective measurement of pelvic organ prolapse. BJOG 2013; 120: 161-168.

24) Gyhagen M, Bullarbo M, Nielsen TF. Prevalence and risk factors for pelvic organ prolapse 20 years after childbirth:a national cohort study in singleton primiparae after vaginal or caesarean delivery. BJOG 2013; 120: 152-160.

25) Ansari M, Sharma PP, Khan S. Pelvic Organ Prolapse in Perimenopausal and Menopausal Women. J Obstet Gynaecol India 2022; 72: 250-257.

26) Li Z, Xu T, Li Z, Gong J, Liu Q, Wang Y, Wang J, Xia Z, Zhu L. An epidemiologic study of pelvic organ prolapse in postmenopausal women: a population-based sample in China. Climacteric 2019; 22: 79-84.

27) Wu JM, Vaughan CP, Goode PS. Prevalence and trends of symptomatic pelvic floor disorders in U.S. women. Obstet Gynecol 2014; 123: 141-148.

28) Myers DL, Sung VW, Richter HE, Creasman J, Subak LL. Prolapse symptoms in overweight and obese women before and after weight loss. Female Pelvic Med Reconstr Surg 2012; 18: 55-59.

29) Giri A, Hartmann KE, Hellwege JN, Velez Edwards DR, Edwards TL. Obesity and pelvic organ prolapse: A systematic review and meta-analysis of observational studies. Am J Obstet Gynecol 2017; 217: 11-26.

30) Handa VL, Blomquist JL, Knoepp LR, Hoskey KA, McDermott KC, Munnoz A. Pelvic floor disorders 5-10 years after vaginal or cesarean childbirth. Obstet Gynecol 2011; 118: 777-784.