



Pelvic Organ Prolapse in Perimenopausal and Menopausal Women

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Received: 16 March 2021 / Accepted: 30 June 2021 / Published online: 9 July 2021
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Abstract

Background Pelvic organ prolapse (pop) is a chronic disorder, often asymptomatic. There are several factors involved in the aetio-pathogenesis of POP. Perimenopausal women bear most of the burden of pop. Vaginal delivery is an established risk factor and clinical presentation may take years when women are symptomatic in menopausal age.

Method A cross-sectional study was done for one year in a rural teaching hospital, where 150 pop women were included. Variables associated with both asymptomatic & symptomatic pop were analyzed. The mean, proportion, & simple logistic regression were used to analyze the data and p value < 0.05 was considered significant.

Results The prevalence of pop was 4.8%. Associated socio-economic & obstetrical variables were age group of 41–50 years (82.7%), housewives (84%), multiparity (93.33%), lower economic conditions (86.7%), home deliveries (74.71%), and early resumption of work after delivery (61.3%). Bulging in the vagina ($p < 0.001$), & difficulties in micturition ($p = 0.001$) were significant symptoms. Among asymptomatic & symptomatic pop, difference in BMI ($p = 0.042$), education level ($p = 0.001$), menstrual history ($p = 0.001$) & place of delivery ($p = 0.037$) were significant. Different stages of pop were significantly associated with differences in age groups ($p < 0.001$), menstrual history ($p < 0.001$) & place of delivery ($p = 0.039$). Differences in the proportion of constipation were significant with anterior compartment defects ($p < 0.001$), whereas the association of chronic lung diseases was found significant ($p = 0.028$) in the case of apical compartment prolapse. Simple logistic regression of co-variants shows age can predict the severity of pop stages (OR 7.25; 95% CI 1.95–26.99).

Conclusion All stages of pop were present mostly in the age group of 41–50 years rather than in the over 50 years age group. Menopause is associated with the severity of prolapse and is mostly symptomatic. Age can predict the severity of pop.

Keywords Perimenopause · Menopause · Pelvic organ prolapse · Symptomatic and asymptomatic pop

Introduction

Pelvic organ prolapse (pop) is a chronic disorder, where herniation of the pelvic organs to or beyond the vaginal walls occurs. Several risk factors are associated with pop. The prevalence of pop is different in different countries. We lack

the exact prevalence of pop as many women can not tell the presence of pop due to social reasons and many are asymptomatic [1]. Miedel and Colleagues recorded that age was an independent risk factor for symptomatic pop with an intact uterus and no history of prior pelvic surgery [2]. Quiroz and colleagues in a study found that in women aged 40 years or older, vaginal delivery increases the chances of prolapse than cesarean section [3].

Therefore the present study is undertaken to estimate prevalence and risk factors associated with pop in perimenopausal and menopausal women.

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Material and Methods

A hospital-based cross-sectional study was done in a teaching hospital, in the Gynecology & Obstetrics department, for one year. Subjects were enrolled if they satisfy the following criteria:

Inclusion criteria:

1. Age > 40 years
2. Vaginally parous women.
3. Symptomatic prolapse.
4. Asymptomatic prolapse presenting with other gynecological conditions.

Exclusion criteria:

1. Women \leq 40 years of age.
2. Pregnant women
3. Previous history of cesarean birth.
4. A prior history of pelvic surgery, hysterectomy, and vault prolapse.
5. Women not willing to participate in the study or not giving consent.

There were a total of 163 perimenopausal and menopausal pop women, out of 3395 patients visiting the Gynecology department, only 150 fulfilled the study criteria. Detailed history & examination findings were recorded and relevant investigations were done. Examination for the different stages of pop was done by using the Pelvic Organ Prolapse Quantification (POP-Q) System and the different compartment defects were noted.

We defined as:

Symptomatic pop—Women were identified as symptomatic if they complained of any of the prolapse symptoms i.e., bulging in the vagina, difficulty in micturition, and difficulty in defecation.

Asymptomatic pop—Women were defined as asymptomatic when presented without the symptoms of pop, and presented with other gynecological conditions like AUB, endometriosis, amenorrhoea, vaginal discharge, contraception, etc.

The socio-economic status of the study subjects was determined using B G Prasad scale [4]. Categorization of Body Mass Index (BMI) in kg/m^2 of the patients was done as per the WHO Asia Pacific Perspective for Asians WHO IOTF 2003 [5].

For statistical analysis, SPSS 21 version was used. Data had been summarized as mean and standard deviation for numerical variables and count & percentage for categorical variables. Pearson's chi-squared test was performed

to see statistical relation. Simple logistic regression was used for further analysis of variables. A p value < 0.05 was considered to be statistically significant.

Results

Table 1 shows 84% of the women were housewives with daily household activities and 10.7% of women were involved in heavy work which includes farmers and laborers. In the present study, 86.7% of the patients belonged to the lower class followed by 13.3% from the lower middle class. In the present study, 42.7% of the patients were obese, 40% of patients had normal BMI and 17.3% were overweight. Among the study population, 52 patients (34.7%) had a history of four or more childbirth followed by 50 (33.3%) of them with three childbirth, 38 (25.3%) of two childbirth, and 10 (6.7%) of single childbirth. Out of 150 patients, 92 (61.3%) patients had a history of early resumption of work. 112 (74.7%) women had a history of home delivery whereas only 38 (25.3%) had a history of hospital delivery.

Table 1 Distribution of POP women according to sociodemographic characteristics

Variables	Frequency (N = 150)	Percentage (%)
Occupation		
House wife	126	84
Heavy worker	16	10.7
Light worker	8	5.3
Socio-economic condition		
Lower middle class	20	13.3
Lower class	130	86.7
Age category		
41–50 Years	124	82.7
> 50 Years	26	17.3
BMI category in Kg/m^2		
Normal (18.5–22.9)	60	40
Overweight (23–24.9)	26	17.3
Obese (≥ 25)	64	42.7
Parity		
One	10	6.7
Two	38	25.3
Three	50	33.3
Four or more	52	34.7
Resumption of work		
Early (< 42 days)	92	61.3
Late (≥ 42 days)	58	38.7
Place of delivery		
Hospital	38	25.3
Home	112	74.7

Table 2 Symptoms in relation to different stages of POP

Symptoms	Stage category			<i>p</i> value
	I (n=83)	II (n=39)	III + IV (n=28)	
Bulging in the vagina				
Absent	65 (78.3%)	5 (12.8%)	4 (14.3%)	<0.001
Present	18 (21.7%)	34 (87.2%)	24 (85.7%)	
Difficulty in micturition				
Absent	67 (80.7%)	23 (59%)	13 (46.4%)	0.001
Present	16 (19.3%)	16 (41%)	15 (53.6%)	
Difficulty in defecation				
Absent	58 (69.9%)	28 (71.8%)	18 (64.3%)	0.795
Present	25 (30.1%)	11 (28.2%)	10 (35.7%)	

Table 2 shows, while comparing the symptoms with different stages of pop, it was found that bulging in the vagina and difficulty in micturition was significantly related to stages of pop and difficulty in defecation was not significant with stages of POP.

Tables 2 and 4 show the analysis of early-stage I, II pop with advanced stages III & IV pop in relation to symptoms and variables for a better clinical point of view.

In Table 3, differences in the proportion of asymptomatic and symptomatic pop are found to be significantly related to the differences in the BMI category, educational qualifications, menstrual history, and place of delivery. However, no statistical significance has been found regarding socio-economic condition, resumption of work & parity.

In Table 4, differences in the stage categories are significantly related to the difference in the age group, menstrual history, and place of delivery. However, no significant relationship has been found between stage categories and differences in the BMI categories, occupations, and socio-economic conditions.

Table 5 shows further analysis with simple logistic regression where the severity of pop is more likely associated with age group and the strength of association was significant (OR 7.25; 95% CI 1.95–26.99).

Table 6 shows the association of variables with different compartment defects. Among the study subjects, 44 of them had constipation and 14 had chronic lung diseases in the present study. Differences in the proportion of menstrual history, age group, and constipation were significant with the anterior compartment defect, whereas the place of delivery and BMI were significant in the posterior compartment defect. In apical compartment defect, differences in the proportion of menstrual history, place of delivery, age group, occupation, and chronic lung diseases were significant.

Table 3 Variables in asymptomatic and symptomatic pop

Variables	Asymptomatic pop (n=64)	Symptomatic pop (n=86)	<i>p</i> value
Education qualification			
Illiterate	34 (53.1%)	68 (79.1%)	0.001
Primary	12 (18.8%)	12 (14%)	
Upper primary and higher	18 (28.1%)	6 (7%)	
Socio-economic condition			
Lower middle class	10 (15.6%)	10 (11.6%)	0.479
Lower class	54 (84.4%)	76 (88.4%)	
BMI Category (kg/m²)			
Normal weight	32 (50%)	28 (32.6%)	0.042
Over weight	12 (18.8%)	14 (16.3%)	
Obese	20 (31.3%)	44 (51.2%)	
Menstrual history			
Premenopause	42 (65.6%)	32 (37.2%)	0.001
Menopause	22 (34.4%)	54 (62.8%)	
Resumption of work			
Early	44 (68.8%)	48 (55.8%)	0.128
Late	20 (31.3%)	38 (44.2%)	
Parity			
One	6 (9.4%)	4 (4.7%)	0.121
Two	20 (31.3%)	18 (20.9%)	
Three	22 (34.4%)	28 (32.6%)	
Four and more	16 (25%)	36 (41.9%)	
Place of delivery			
Hospital	22 (34.4%)	16 (18.6%)	0.037
Home	42 (65.6%)	70 (81.4%)	

Discussion

In our population study, the prevalence of asymptomatic and symptomatic pop is the proportion of 2:3. The prevalence varies in different regions due to multiple socio-cultural facts. In our study, the prevalence of pop was 4.8%. In Chandigarh, India prevalence of pelvic organ prolapse is 7.6% [6]. A Study made at the Government Rajaji Hospital, Madurai, Tamilnadu, India reported a prevalence of 1.6% prolapse in gynecological cases [1]. In the USA, 2.9% of women reported symptoms of prolapse as per the National Health and Nutrition Examination Survey [7]. As per symptoms, the prevalence of POP was much lower (3–6%) than the prevalence identified after the examination (41–50%) [8].

The majority of women were housewives aged between 41–50 years and belonged to the low socio-economic group in the present study. The mean age was 46.96 ± 5.899 years, ranging from 41 to 65 years. The modal age group was 41 to 50 years (82.7%) followed by more than 50 years (17.3%). Mean parity was 3.07 ± 1.139 and mean BMI was 24.112 ± 3.41 kg/m² in this study. Demographic and

Table 4 Variables in relation to different stages of POP

Variables	Stage I (n=83)	Stage II (n=39)	Stage III+IV (n=28)	p value
Socio-economic condition				
Lower middle class	11 (13.3%)	5 (12.8%)	4 (14.3%)	0.984
Lower class	72 (86.7%)	34 (87.2%)	24 (85.7%)	
Menstrual history				
Premenopause	54 (65.1%)	8 (20.5%)	12 (42.9%)	<0.001
Menopause	29 (34.9%)	31 (79.5%)	16 (57.1%)	
Place of delivery				
Hospital	26 (31.3%)	10 (25.6%)	2 (7.1%)	0.039
Home	57 (68.7%)	29 (74.4%)	26 (92.9%)	
Age group				
41–50 years	81 (97.6%)	27 (69.2%)	16 (57.1%)	<0.001
> 50 years	2 (2.4%)	12 (30.8%)	12 (42.9%)	
Occupation				
House wife	74 (89.2%)	28 (71.8%)	24 (85.7%)	0.066
Heavy worker	5 (6%)	9 (23.1%)	2 (7.1%)	
Light worker	4 (4.8%)	2 (5.1%)	2 (7.1%)	
BMI category				
Normal weight	35 (42.2%)	17 (43.6%)	8 (28.6%)	0.228
Over weight	18 (21.7%)	4 (10.3%)	4 (14.3%)	
Obese	30 (36.1%)	18 (46.2)	16 (57.1%)	

Table 5 Simple logistic regression and p value of co-variants with dependable variables

Co-variants	Early pop (stage I+II) vs advance pop (stage III+IV)		
	Odds ratio	95% C.I ^a	p value
Socio-economic condition	1.099	0.300–4.029	1.00
Age group	7.257	1.951–26.994	<0.001
Resumption of work	1.513	0.606–3.777	0.669
Place of delivery	3.692	0.769–17.715	0.015
Menstrual history	0.472	0.141–1.584	0.531

^aCI Confidence Interval

obstetrical variables found in different studies in pop, also support our study findings. Gumanga et al., reported mean age of 45.9 ± 15.1 years [9]. In a study done by Dhama et al., mean age of POP was 47 years, whereas in a study done at Bahir Dar, North West Ethiopia the mean age was found to be $43 + 12$ years [10, 11]. In the present study, 84% of the study population were housewives with daily household activities, but they were engaged in daily lifting or carriage of water, farm produce, firewood, and traded goods. These activities can increase the risk for POP or worsen existing POP. It is also found that 10.7% of the patients were involved in heavy work, the majority of them being

farmers and laborers which involved lifting heavy weights and prolonged sitting in squatting position in their routine work, which would have contributed to the prolapse. In a case–control study by Asresie et al., it was found that 75% of the cases had a history of lifting heavy objects [11]. In another study done by Masenga G. G. et al., it was found that women who carried out heavy work for five hours or more daily had almost five times increased risk of severe POP [12].

In the present study, majority of the patients belonged to the low socio-economic class (86.7%) followed by the lower middle class (13.3%), as per the modified B. G. Prasad scale [4]. In a study done by Sumathi N. et al., the majority (99%) of the patients belonged to the low socio-economic class [1].

Obesity was significantly associated with POP as reported by Giri A et al. in a systematic review and meta-analysis of observational studies [13]. In the present study, 42.7% of patients were found to be obese followed by normal weight (40%) and overweight (17.3%), as per the Asia Pacific Perspective for Asians (WHO IOTF 2003) [5]. In a study by Pooja et al., the majority (59.97%) of patients had BMI < 24.9 kg/m² and 40.41% of patients had BMI \geq 25 kg/m² [14]. In a prospective observational cohort study, stage II pop was found in 56.9% women after first vaginal birth [15]. The majority had a history of multiple births at home and early resumption of work after delivery in the present study. In our study, only vaginally delivered women have been included and the proportion of POP has been found increasing with parity. POP was found to be more prevalent among multiparous women (93.3%, 140/150) as compared to primipara (6.7%, 10/150) which is similar to the result seen in the study done by Sumathi N. et al., where 94% of women who had delivered 2 or more children had POP [1]. In a retrospective study, by Peker N et al., it was found that the number of deliveries is associated with the development of pop who gave birth by vaginal route at home [16]. In the present study, only 25.3% of all POP women had a history of delivery in hospital, and the majority (74.7%) of them delivered at home. In a study done at Bahir Dar, North West Ethiopia, it was found that the majority (83.3%) of the patients had a history of last birth at home [11].

Difficulty in defecation was the most common symptom associated with stage I prolapse, whereas vaginal bulging predominates in stage II & higher stages of prolapse. Difficulties in micturition followed an increasing trend of distribution with increasing stages of prolapse. Stress urinary incontinence was found in 6.66% (10/150) pop women in the present study. Differences in vaginal bulging & difficulties in micturition were highly significant in relation to different stages of prolapse in the present study. Dhama et al., reported something coming out of the vagina was the most consistent symptom found in 84% of patients [10]. In a study done by Pooja et al., they found that the most common

Table 6 Relationship of variables with different compartment defect in pelvic organ prolapse

Variables	Anterior wall defect			Apical defect			Posterior wall defect		
	Absent (n = 22)	Present (n = 128)	<i>p</i> value	Absent (n = 74)	Present (n = 76)	<i>p</i> value	Absent (n = 36)	Present (n = 114)	<i>p</i> value
Socio-economic condition									
Lower middle class	5	15	0.161	11	9	0.586	4	16	0.653
Lower class	17	113		63	67		32	98	
Menstrual history									
Premenopause	17	57	0.005	44	30	0.014	17	57	0.771
Menopause	5	71		30	46		19	57	
Place of delivery									
Hospital	4	34	0.404	25	13	0.019	14	24	0.032
Home	18	94		49	63		22	90	
Age group									
41–50 years	22	102	0.020	71	53	<0.001	32	92	0.258
> 50 years	0	26		3	23		4	22	
Occupation									
House wife	18	108	0.685	70	56	0.002	33	93	0.212
Heavy workers	2	14		2	14		1	15	
Light workers	2	6		2	6		2	6	
BMI									
Normal	12	48	0.053	35	25	0.187	21	39	0.013
Over weight	0	26		12	14		7	19	
Obese	10	54		27	37		8	56	
Chronic lung diseases									
Absent	19	117	0.453	71	65	0.028	32	104	0.674
Present	3	11		3	11		4	10	
Constipation									
Absent	7	99	<0.001	49	57	0.237	29	77	0.135
Present	15	29		25	19		7	37	

symptom was something coming out per vaginum (97.87%) followed by disturbances in micturition found in 93.62% of women [14].

Out of 150 pop women, 86 (57.3%) were symptomatic and 64 (42.7%) were asymptomatic, but they were presented with other gynecological symptoms. Clinical presentation may vary in patients according to their priorities & concern. Pelvic floor-related symptoms do not predict the anatomic location of the prolapse in women with mild to moderate prolapse [17]. Distribution of variables in an asymptomatic pop group, in terms of socio-economic conditions, resumption of work after delivery, and place of delivery followed a similar trend of distribution, among subgroups, with symptomatic pop in the present study. Most of them had normal body weight and are pre-menopausal in the asymptomatic pop group, whereas obesity and menopause were common in symptomatic pop women. Obesity seems to be a risk factor for symptoms of prolapse [18]. Forceps delivery and a BMI over 25 were associated with higher POP, observed in a study by Glazener et al. [19].

In the present study, 50.7% (76/150) of the patients were menopausal and 49.3% (74/150) were pre-menopausal. In a study done by Burrows et al., 75% were menopausal and 25% were pre-menopausal [20]. However, a contrasting result was found in another study with the majority (62.5%) of patients being pre-menopausal and 37.5% being menopausal [9]. In our study, Stage I pop was found mostly in pre-menopausal women, whereas in menopausal women stage II, III & IV were common. Hence it can be inferred that menopause is associated with advance or higher stages of prolapse and it is highly significant in the present study. The proportion of all of the stages of prolapse was more among in the 41–50 years age group than in the over 50 years age group and the difference was highly significant in the present study indicating that disease is developing following vaginal delivery and pop can be identified at an early age. In a study done by Masenga G.G et al., the prevalence of the POP, stage was found to increase with advancing age [12]. However, Gyhagen et al., in their study showed that age is not a risk factor for symptomatic POP [21]. If POP is described by

validated pelvic organ prolapse quantification examination alone, 30 to 65% of women will have Stage II prolapse, who are presenting for routine gynecological care [22].

Home delivery carries a risk in all stages of prolapse, whether it is symptomatic or asymptomatic as found in the present study. Differences in place of delivery were statistically significant in relation to differences in stage category prolapse and also in symptomatic vs asymptomatic group as shown in tables no-3 & 4. These all indicated that hospital delivery under supervision may decrease the prevalence of pop in future. In the present study, out of 150 pop more than half of the patients (83, 55.3%) had stage I pop, followed by stage II (39, 26%), stage III (24, 16%), and stage IV (4, 2.7%) pop. Almost similar results and trends were found in a study done by Quiroz et al. [3] On the contrary, Dhama et al., in their observational study showed POP in stage 1 was 0% followed by 16% in stage 2, and 49% and 35% in stage 3, 4, respectively [10]. These differences in the result may be due to the inclusion of asymptomatic patients in the present study, which consisted of the majority (74.70%, 62/83) among the total stage I pop. Incidence of pop doubles with each decade in women aged between 20–59 years [23]. An increase in incidence may be due to age-related physiological changes, degenerative processes, and hypoestrogenism. Age is also known to be associated with the prevalence and severity of all pelvic floor disorders.

Simple logistic regression and *p* value of the co-variants show there is a relationship between age and different stages of prolapse (OR 7.25; 95% CI 1.95–26.99), which was highly significant as shown in table no 5. Place of delivery and resumption of work have a risk effect on the severity of pop stages.

Table 6 shows variables associated with anterior, posterior, and apical compartment defects in the present study. In the present study, anterior vaginal wall prolapse was found in the majority (128/150, 85.3%) followed by posterior vaginal wall prolapse (114/150, 76%) and apical prolapse (76/150, 50.7%). Combined, all compartment defects were found to be present in 44% (66/150) of the women. Home deliveries were mostly associated with apical defect (63/76, 82.89%) and posterior compartment defect (90/114, 78.94%) and the differences in the proportion of place of delivery were significant. Akter F et al., in a cross-sectional survey, found that COPD and constipation were positively associated with pop which has the potential to be modified [24]. In the present study, chronic lung diseases with cough were associated with all three compartment defects, and differences in the proportion of chronic lung diseases were found to be significant ($p=0.028$) in the apical compartment prolapse. In the present study, constipation was mostly associated with posterior compartment defects (37/114, 32.45%) than apical (19/76, 25%) or anterior defects (29/128, 22.65%), and differences in the proportion of constipation were significant with anterior

compartment defects ($p < 0.001$). Ellerkmann RM et al., in a study, found that women with pop experience symptoms that do not necessarily correlate with compartment-specific defects [25]. Genetic factors vary from race, ethnicity, family history, advanced molecular biology, and genes associated with pop as noted in an article by Weintraub et al. [26]. In our single-center hospital-based, limited period study, it is difficult to pinpoint the association of genetics in pop. Economically weak and illiterate women constitute the bulk of the patient flow in the present study. However, the distribution of pop among people of different religions follows the population distribution in this area.

Limitations of the study—a different study design, where all hospital delivered women in the community will be included, which may further highlight the strength of the relationship between predictors and outcome.

In conclusion, symptomatic or asymptomatic pop is common following vaginal delivery in menopausal and perimenopausal women. All stages of pop were present mostly in 41–50 years age than over 50 years age. Age can predict the severity of pop. Menopause is associated with the severity of prolapse and in most cases were symptomatic. Anterior vaginal wall prolapse was the most common followed by the posterior vaginal wall prolapse in the present study. Hence there is a scope for early detection of pop which will improve patient care service.

Authors contributions MD KA &SK—design, data collection, analysis, interpretation of data and drafting of the article. PPS: conception, design, acquisition of data, analysis and revise critically for intellectual content of the article and final approval of the version.

Funding No funding source.

Declarations

Conflict of interest None declared regarding financial, personal, political, intellectual, or religious interests.

Ethical Approval This study on human participants was approved by the institutional ethics committee and has been performed in accordance with the ethical standard as laid down in the Helsinki Declaration. This article does not contain any studies with animals performed by any of the authors.

Informed Consent Patients written, informed consent for the study was taken before enrollment.

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