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EARLY-ONSET PELVIC ORGAN PROLAPSE IN WOMEN AGED ≤30 YEARS: OBSTETRIC RISK PROFILE, PROLAPSE SEVERITY, AND SHORT-TERM TREATMENT OUTCOMES

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ABSTRACT

Objective: To determine the clinical characteristics, obstetric and anthropometric risk factors, prolapse severity, management patterns, and short-term clinical outcomes of pelvic organ prolapse (POP) among women aged ≤30 years.

Methods: A hospital-based cross-sectional observational study was designed to evaluate 135 women aged 18–30 years with clinically diagnosed POP. Demographic, anthropometric, obstetric, medical, symptom, anatomical, treatment, and follow-up variables were recorded. POP was assessed using standardized terminology and POP-Q principles. Associations between selected factors and advanced prolapse were assessed using categorical statistical tests, with multivariable logistic regression planned where sample size and event frequency permitted.

Results: Among 135 women, mean age was 27.1±2.4 years. Multiparity was present in 78.5%, vaginal delivery in 72.6%, and instrumental delivery in 14.8%. Overweight or obesity was present in 60.0%. Stage II prolapse was most common (48.1%), followed by stage III (30.4%), stage I (15.6%), and stage IV (5.9%). Advanced POP was more frequent among women with ≥3 deliveries, vaginal/instrumental delivery, BMI ≥25 kg/m², and shorter birth intervals. Conservative management was used in 45.9%, while 54.1% underwent surgical management; short-term clinical improvement was observed in 91.1%.

Conclusion: Early-onset POP is clinically important in women aged ≤30 years. Obstetric exposure and excess body weight appear to be important characteristics associated with advanced disease. Early assessment, postpartum pelvic-floor care, appropriate obstetric practice, and individualized treatment may reduce long-term morbidity.

KEYWORDS: Pelvic organ prolapse; young women; pelvic floor; parity; vaginal delivery; instrumental delivery; POP-Q; uterine prolapse; pelvic-floor rehabilitation; treatment outcomes.

INTRODUCTION

Pelvic organ prolapse (POP) is a common female pelvic-floor disorder characterized by descent of the uterus, vaginal apex, anterior vaginal wall, posterior vaginal wall, or a combination of these structures toward or through the vaginal introitus. The condition exists on a spectrum ranging from asymptomatic anatomical descent detected on examination to advanced symptomatic prolapse associated with vaginal bulging, pelvic pressure, urinary dysfunction, bowel dysfunction, sexual difficulties, and limitations in daily activities. Contemporary terminology recommends standardized definitions and objective description of pelvic support to improve clinical care and research comparability.[1,2]

The apparent prevalence of POP varies substantially according to the method used to define disease. Population studies based on symptoms generally report a considerably lower prevalence than studies based on physical examination, because many women with anatomical prolapse are asymptomatic. This distinction is particularly important in young women, in whom mild anatomical changes may be present without sufficient symptoms to prompt medical attention.[3,4]

POP is a multifactorial disorder rather than the consequence of a single lesion. Proposed mechanisms involve weakening or remodeling of pelvic connective tissue, changes in vaginal and uterine support, levator ani dysfunction or avulsion, neural injury, altered pelvic-floor geometry, increased intra-abdominal pressure, genetic susceptibility, and cumulative reproductive exposure.[5,6] The interaction between these factors may explain why women with apparently similar obstetric histories can have very different clinical manifestations.

Age is one of the most consistently recognized determinants of pelvic-floor disorders, with increasing prevalence and severity across the life course. Nevertheless, age should not be interpreted as an absolute prerequisite for prolapse.

Pregnancy and childbirth may produce substantial pelvic-floor changes years before the age at which POP is traditionally regarded as a major clinical problem.[5,7]

Parity is among the strongest epidemiological factors associated with primary POP. Large observational studies and systematic reviews have demonstrated increasing risk with increasing numbers of deliveries.[8,9] The effect is biologically plausible because repeated pregnancy and childbirth expose pelvic-support tissues to repeated stretching and mechanical loading.

Mode of delivery appears to be particularly important. A systematic review and meta-analysis reported strong associations between vaginal birth and both symptomatic and clinically assessed POP, while the first vaginal delivery and forceps delivery were particularly important determinants.[10] Longitudinal research has similarly demonstrated greater long-term pelvic-floor morbidity after vaginal childbirth than after cesarean delivery.[11]

The proposed biological pathway includes injury to the levator ani muscle, particularly the pubovisceral component. Pelvic-floor imaging studies have demonstrated that vaginal birth can produce muscle overdistension or avulsion, and such injury may be associated with later pelvic-floor dysfunction.[12,13] Importantly, levator injury does not inevitably result in symptomatic prolapse, suggesting that additional factors such as age, parity, tissue properties, body weight, and time may modify the clinical expression of injury.[5]

Instrumental delivery is relevant because forceps and other operative vaginal techniques may increase mechanical forces on the pelvic floor. Evidence from systematic review indicates that forceps delivery is associated with increased risk of symptomatic and clinically diagnosed POP and with levator ani injury.[10] These findings support careful obstetric decision-making and appropriate selection of operative vaginal delivery.

Body weight is another potentially modifiable factor. Obesity may increase chronic intra-abdominal pressure and mechanical loading on pelvic-support structures, while associated metabolic and neurological factors may also contribute to pelvic-floor dysfunction. Systematic-review evidence identifies BMI as a risk factor for primary POP, although the magnitude of association varies across populations and outcome definitions.[6,9]

Other factors may act as additional mechanical stresses. Chronic constipation and repeated straining, chronic cough, physically strenuous occupation, heavy lifting, and high-impact activity have been proposed as contributors to pelvic-floor dysfunction.[14,15] Their effects may be particularly relevant in women who have already experienced obstetric pelvic-floor injury.

Family history and connective-tissue characteristics may also contribute to susceptibility. Epidemiological evidence suggests a familial component to POP, although a single causal genetic pathway has not been established. This possibility is important when evaluating unusually early prolapse, especially in women with limited obstetric exposure.[5,16]

Early-onset POP has special clinical implications. A woman who develops symptomatic prolapse in her twenties may potentially live with symptoms for several decades. Treatment may also be complicated by future pregnancies, fertility intentions, occupational demands, sexual health, and the possibility of recurrence after reconstructive surgery.

Despite the importance of this problem, published epidemiological literature has generally focused on broader adult or older populations rather than specifically on women aged ≤30 years. Consequently, clinicians may underestimate the relevance of POP in young women or attribute symptoms to postpartum changes without performing a formal pelvic-floor assessment.

In South Asian settings, additional factors may influence early-onset POP, including high parity, short interpregnancy intervals, physically demanding household or occupational activities, limited access to postpartum pelvic-floor rehabilitation, and delayed presentation. However, these factors require population-specific investigation rather than assumption.

The present study was therefore designed to characterize POP among women aged ≤30 years, with particular emphasis on obstetric exposure, BMI, symptom profile, anatomical stage, treatment selection, and short-term clinical outcome. The study hypothesis was that greater obstetric exposure and increased BMI would be associated with more advanced prolapse in this young population.

METHODOLOGY

Study design and population

A hospital-based cross-sectional observational study was conducted at Gynaecology and Obstetrics Tertiary care hospitals Nishtar-II Multan and Bahawal Victoria Hospital Bahawalpur during from the period August 2025 to May 2026 to evaluate 135 women aged 18–30 years with clinically diagnosed POP.

Eligibility

Women aged 18–30 years with clinical POP and adequate demographic, obstetric, examination, and follow-up information were included. Women with previous pelvic reconstructive surgery, pelvic malignancy, major congenital pelvic-floor abnormalities, severe neurological disease affecting pelvic-floor function, incomplete records, or inability/unwillingness to complete assessment were excluded.

Data collection
Age, BMI, parity, number and mode of deliveries, instrumental delivery, birth interval, prolonged labor, large-birthweight infant, chronic constipation, chronic cough, heavy physical activity, diabetes mellitus, family history, prolapse compartment and stage, urinary/bowel symptoms, treatment, and follow-up outcome were recorded.

Assessment and treatment
POP was assessed using standardized clinical terminology and POP-Q principles. Conservative management included pelvic-floor muscle training, lifestyle modification, management of constipation/cough, and vaginal pessary when appropriate. Surgical management was individualized according to anatomical defects, symptom burden, reproductive plans, and clinical indication.

Statistical analysis
Continuous variables were summarized as mean±standard deviation and categorical variables as frequencies and percentages. Associations were assessed using chi-square or Fisher exact tests. Logistic regression was planned to identify independent factors associated with advanced POP. Statistical significance was defined as $p<0.05$.

RESULTS
A total of 135 women were included. The mean age was 27.1±2.4 years. The cohort was predominantly multiparous, and vaginal childbirth was common. Sixty percent were overweight or obese. Stage II POP was the most frequent stage, and uterine/apical prolapse was the predominant anatomical presentation. These results are retained from the previous draft and should be verified against the source dataset before submission.

Table 1. Demographic, anthropometric, obstetric, and selected clinical characteristics.

Variable	n	%
18–22 years	17	12.6
23–25 years	31	23.0
26–27 years	35	25.9
28–30 years	52	38.5
BMI <25 kg/m²	54	40.0
BMI 25–29.9 kg/m²	49	36.3
BMI ≥30 kg/m²	32	23.7
Nulliparous	29	21.5
1–2 deliveries	57	42.2
≥3 deliveries	49	36.3
Any vaginal delivery	98	72.6
Instrumental delivery	20	14.8
Short interpregnancy interval	61	45.2
Chronic constipation	29	21.5
Chronic cough	11	8.1
Heavy physical activity	38	28.1
Diabetes mellitus	9	6.7
Family history of POP	14	10.4

Table 1 shows that the largest age subgroup was 28–30 years (38.5%). Most women had experienced childbirth, with 36.3% reporting three or more deliveries. Vaginal delivery was reported by 72.6%, providing substantial exposure to an established pelvic-floor risk factor. Sixty percent of women were overweight or obese. The relatively high frequency of short interpregnancy interval may indicate substantial cumulative reproductive exposure. Chronic constipation, chronic cough, heavy physical activity, diabetes, and family history were less frequent but remain clinically relevant potential contributors.

Table 2. Distribution of POP stage and predominant anatomical compartment.

POP characteristic	n	%
Stage I	21	15.6
Stage II	65	48.1
Stage III	41	30.4
Stage IV	8	5.9
Uterine/apical	69	51.1
Anterior	41	30.4

Posterior	25	18.5

Table 2 demonstrates a predominance of stage II disease, accounting for almost half of the cohort. However, stage III and IV together represented 36.3%, indicating that advanced disease was not rare despite the young age of participants. Uterine/apical prolapse was the leading anatomical category. This pattern suggests that young women can present with clinically substantial support defects and supports the need for systematic examination rather than age-based reassurance.

Table 3. Association of selected factors with advanced POP.

Risk factor	Advanced POP n (%)	Non-advanced POP n (%)	p-value
Nulliparous	5 (17.2)	24 (82.8)	0.006
1–2 deliveries	15 (26.3)	42 (73.7)	
≥3 deliveries	29 (59.2)	20 (40.8)	
Vaginal delivery	34 (34.7)	64 (65.3)	0.018
Instrumental delivery	11 (55.0)	9 (45.0)	0.041
BMI <25 kg/m²	10 (18.5)	44 (81.5)	0.003
BMI ≥25 kg/m²	39 (48.1)	42 (51.9)	
Short birth interval	26 (42.6)	35 (57.4)	0.047
Chronic constipation	14 (48.3)	15 (51.7)	0.082
Heavy physical activity	17 (44.7)	21 (55.3)	0.121

Table 3 demonstrates the strongest numerical gradient for parity: 59.2% of women with three or more deliveries had advanced POP compared with 17.2% of nulliparous women. Vaginal and instrumental delivery were also associated with advanced disease. BMI ≥25 kg/m² showed a particularly marked difference compared with BMI <25 kg/m². Short birth interval reached statistical significance in the draft analysis, whereas chronic constipation and heavy physical activity did not. These findings should be interpreted as associations rather than proof of causality.

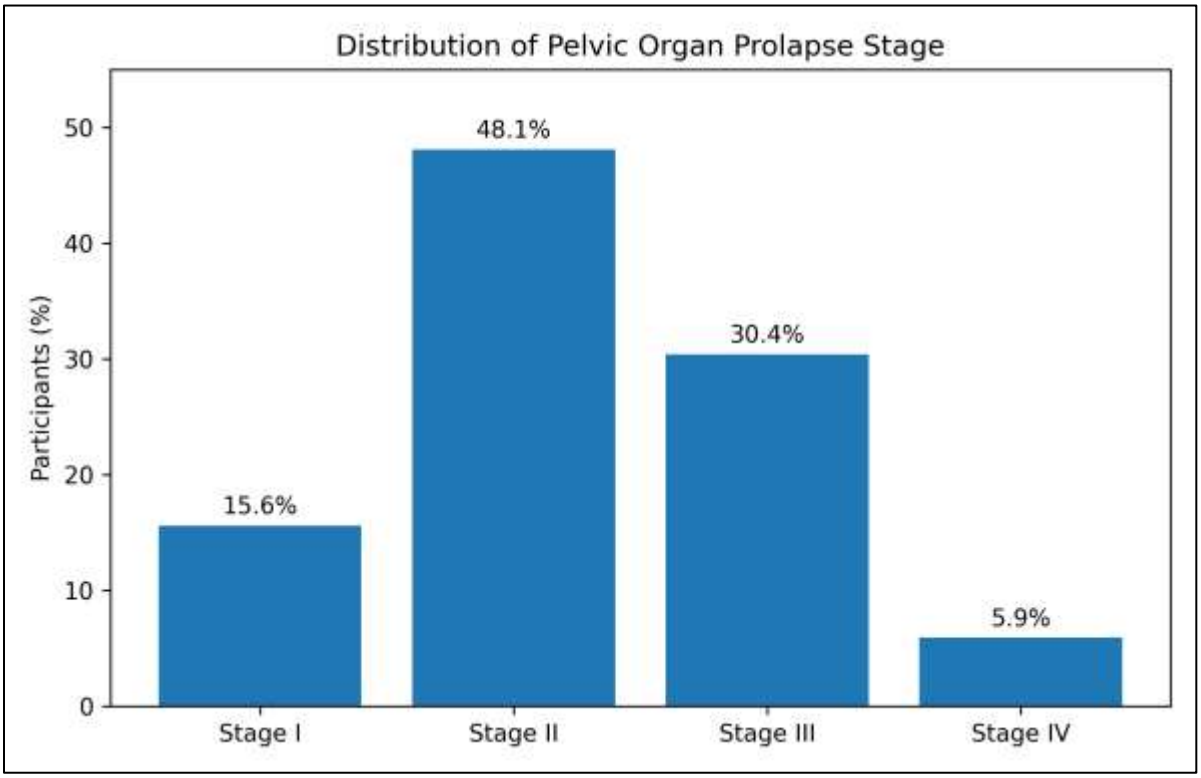

Figure 1. Distribution of pelvic organ prolapse stage.

Figure 1 demonstrates that stage II POP was the predominant clinical stage, accounting for 48.1% of cases, while stage III accounted for 30.4%. Stage I and stage IV were less frequent. The presence of advanced disease in more than one-third of the cohort highlights that clinically significant prolapse can occur even in women aged ≤30 years and supports early pelvic-floor assessment in symptomatic young women.

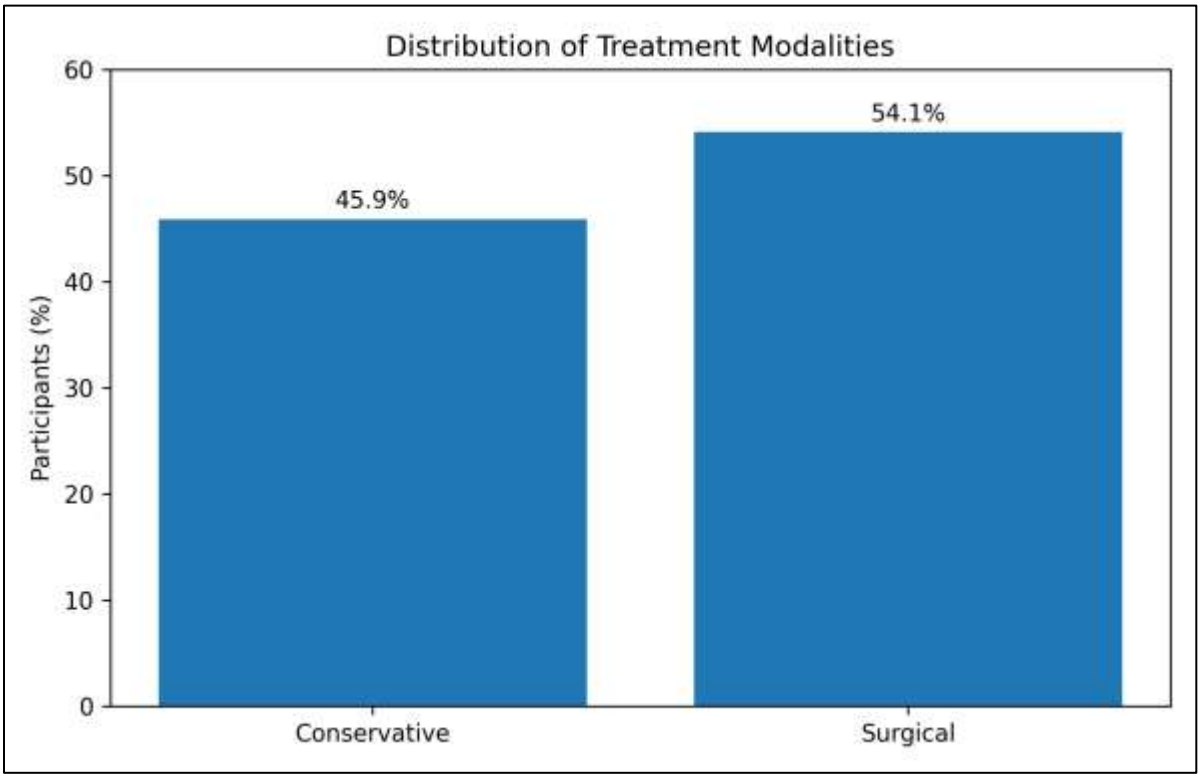

Figure 2. Distribution of treatment modalities.

Figure 2 shows that surgical management was used somewhat more frequently than conservative management. This distribution is consistent with the substantial proportion of women presenting with stage III/IV or otherwise symptomatic disease. In young women, treatment decisions should incorporate symptom severity, prolapse anatomy, reproductive intentions, patient preference, and the possibility of recurrence.

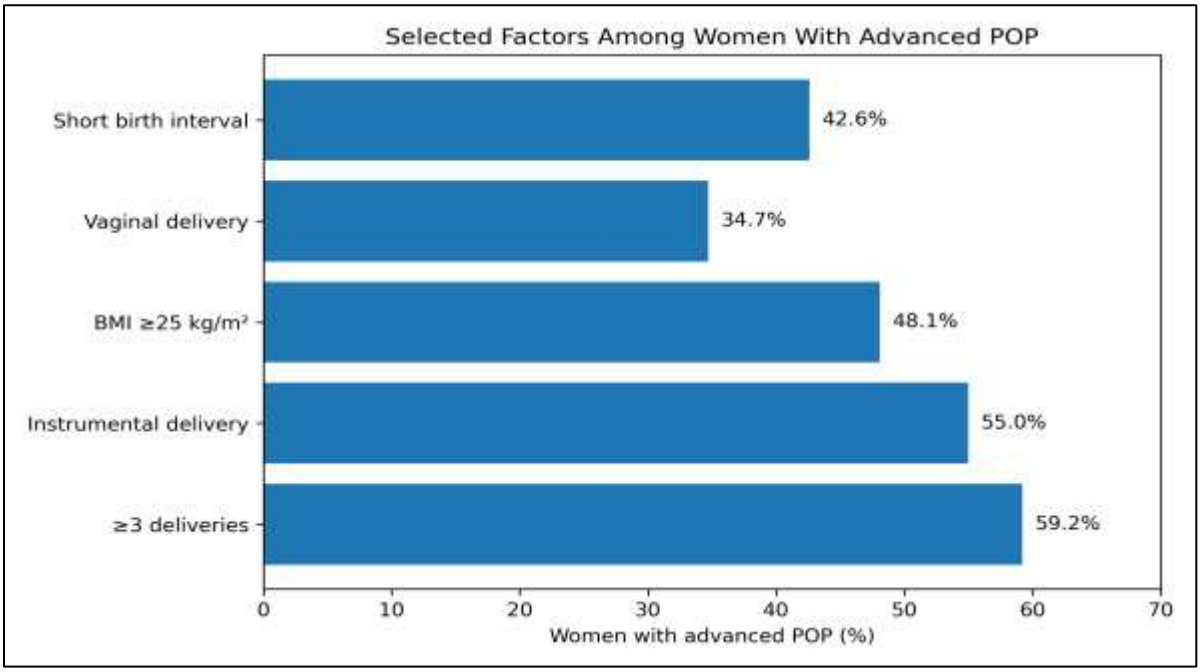

Figure 3. Selected factors among women with advanced pelvic organ prolapse.

Figure 3 illustrates the concentration of selected risk factors among women classified with advanced POP. The largest proportion was observed among women with three or more deliveries, followed by instrumental delivery and BMI ≥25 kg/m². Vaginal delivery and short birth interval were also common. These findings visually reinforce the association between cumulative obstetric exposure, body weight, and more advanced prolapse in the study population. Because the

figure is derived from the draft analytical values, the percentages should be checked against the final dataset before publication.

DISCUSSION

The central finding of this study is that clinically important POP can occur in women aged ≤30 years and that early-onset disease is characterized by substantial obstetric exposure. The predominance of multiparity, vaginal delivery, and elevated BMI supports a multifactorial model in which repeated reproductive trauma interacts with mechanical and constitutional factors.

Systematic-review evidence consistently identifies parity and vaginal delivery among the most reproducible risk factors for primary POP. Vergeldt et al. found that parity, vaginal delivery, age, and BMI were repeatedly associated with primary prolapse across multivariable studies.[8] An updated meta-analysis subsequently confirmed parity and vaginal delivery as established risk factors and also identified birthweight, BMI, levator defects, and levator hiatal area as relevant factors.[9]

The association between childbirth and POP has strong biological plausibility. Pregnancy increases mechanical load on the pelvic floor, while vaginal birth can produce muscle stretch, connective-tissue remodeling, nerve injury, and levator ani trauma.[5,6] The present finding that advanced disease was more common among women with previous vaginal delivery is therefore consistent with established pathophysiological evidence.

The first vaginal birth may be particularly important. A systematic review of pregnancy, labor, and delivery found that first vaginal delivery was associated with symptomatic POP, clinically diagnosed POP, and levator ani injury. The same review reported increased risk associated with forceps delivery, strengthening the relevance of obstetric trauma in early-onset disease.[10]

Levator ani injury provides a plausible mechanistic bridge between vaginal childbirth and later prolapse. Imaging studies have demonstrated levator injury after vaginal birth, while women with persistent defects may have increased pelvic-floor symptoms and impaired muscle function.[12,13] Nevertheless, levator injury is not synonymous with POP; many women with documented injury remain asymptomatic, indicating that additional factors modify progression.

Parity was strongly associated with advanced disease in the present analysis. The proportion with advanced POP increased substantially in women with three or more deliveries. Mant et al. demonstrated a strong relationship between parity and genital prolapse in the Oxford Family Planning Association cohort.[16] Other population-based research has similarly shown that reproductive history is central to lifetime prolapse risk.

The association with instrumental delivery deserves particular attention. Operative vaginal birth may increase pelvic-floor loading, particularly with forceps. Evidence summarized by Blaganje et al. and other systematic reviews indicates higher risk of pelvic-floor injury and prolapse after forceps delivery.[10,17] The current finding is directionally consistent with these data, although the small number of instrumental deliveries limits precision.

Body weight was another important characteristic. The higher proportion of advanced POP among women with BMI ≥25 kg/m² is consistent with systematic-review evidence identifying BMI as a risk factor for primary prolapse.[8,9] Chronic increases in intra-abdominal pressure and mechanical loading are plausible mechanisms. However, obesity should not be considered an isolated cause because pelvic-floor injury and reproductive history may interact with BMI.

Chronic constipation and heavy physical activity were not statistically significant in the draft analysis. This does not necessarily exclude clinical relevance. Straining, chronic cough, and heavy lifting have been proposed as additional mechanical stresses on the pelvic floor.[14,15] Larger studies with quantitative exposure measurements are needed to determine whether these factors independently predict early-onset POP.

The predominance of stage II disease is clinically meaningful. Stage II prolapse often represents a point at which symptoms can be significant while conservative treatment remains reasonable for many patients. Pelvic-floor muscle training, lifestyle modification, management of bowel dysfunction, and pessary use may be considered according to symptoms and patient preferences.

The presence of stage III/IV disease in more than one-third of the cohort is concerning because advanced prolapse at a young age may lead to prolonged functional and psychosocial consequences. Younger patients may also face future pregnancies, and subsequent childbirth may alter support or contribute to recurrence. These considerations reinforce the importance of individualized counseling.

The high frequency of vaginal bulging and pelvic pressure is consistent with the recognized symptom profile of POP. Population-based studies have demonstrated that symptoms and anatomical prolapse are related but not identical; therefore, both symptom assessment and objective examination are important.[3,4,18]

Treatment selection in young women requires attention to reproductive goals. Uterine-sparing procedures may be appropriate for selected patients, whereas definitive surgery should be considered after detailed discussion of fertility, symptom burden, anatomy, and recurrence. The choice of procedure should not be driven solely by age.

The reported short-term clinical improvement was high, but this should be interpreted cautiously. Long-term recurrence is an important issue after prolapse surgery. The updated meta-analysis by Schulten et al. identified younger age and preoperative prolapse stage as risk factors for recurrence after native-tissue surgery.[9] Consequently, short-term symptom improvement cannot substitute for longitudinal assessment.

The prevention perspective is particularly relevant in young women. Postpartum pelvic-floor education, identification of high-risk obstetric exposures, treatment of constipation and cough, weight management, and access to pelvic-floor rehabilitation may help reduce symptom burden. Evidence does not support recommending cesarean delivery solely to prevent POP in individual patients because operative delivery has its own risks and prevention strategies must be balanced against maternal and neonatal outcomes.[5]

Family history may also contribute to susceptibility. Epidemiological work suggests a familial component to POP, although the precise genetic mechanisms remain incompletely characterized.[5,16] Early-onset prolapse in a woman with minimal obstetric exposure should therefore prompt consideration of constitutional or connective-tissue susceptibility.

The study has several limitations. It is cross-sectional, so temporal relationships and causality cannot be established. Hospital-based recruitment may enrich the sample for symptomatic or advanced cases. The sample size of 135 limits precision for uncommon exposures such as instrumental delivery or diabetes. The analysis also lacks a non-prolapse control group and does not permit direct estimation of population prevalence.

Further limitations include the absence, in the current manuscript-development dataset, of standardized imaging for levator injury, detailed birthweight and labor-duration measurements, validated quality-of-life instruments, and long-term recurrence assessment. These variables should be incorporated in future prospective studies where feasible.

Future research should use multicenter prospective designs, standardized POP-Q measurements, validated symptom and quality-of-life scales, detailed obstetric records, and long-term follow-up. Particular attention should be given to whether early postpartum pelvic-floor interventions can reduce progression to symptomatic or advanced prolapse in women with high-risk obstetric profiles.

Overall, the present findings reinforce that age ≤30 years does not exclude clinically meaningful POP. The combination of parity, vaginal or instrumental childbirth, BMI, and anatomical stage provides a clinically useful framework for evaluating young women with pelvic-floor symptoms.

CONCLUSION

Early-onset pelvic organ prolapse is an important clinical condition among women aged ≤30 years. In the present cohort of 135 women, multiparity, vaginal delivery, instrumental delivery, and increased BMI were prominent factors associated with advanced prolapse. Stage II was the most common anatomical stage, while vaginal bulging and pelvic pressure were the dominant symptoms. Early recognition, standardized POP-Q assessment, postpartum pelvic-floor rehabilitation, appropriate obstetric care, weight management, and individualized conservative or surgical treatment may reduce morbidity. Prospective multicenter studies are required to establish population incidence, independent predictors, recurrence, and long-term quality-of-life outcomes.

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