Factors Associated with Pelvic Organ Prolapse in Eastern Region of Nepal: A Case Control Study

Dharti Joshi,[1] Nilambar Jha,[1] Ishwari Sharma Paudel,[1] Mohan Chandra Regmi,[2] Avaniendra Chakravartty[1]

[1]School of Public Health and Community Medicine, B.P. Koirala Institute of Health Sciences, Dharan, Nepal,
[2]Department of Obstetrics and Gynecology, B.P. Koirala Institute of Health Sciences, Dharan, Nepal.

ABSTRACT

Background: Pelvic organ prolapse is a significant public health problem in Nepal affecting a large number of women. This study was carried out to identify the factors associated with pelvic organ prolapse among the women of eastern part of Nepal.

Methods: This was a matched case–control study. Cases were women aged ≥15 years with at least one parity having stage 2 and above pelvic organ prolapse attending Gynecology OPD of BP Koirala Institute of Health Sciences, Dharan and the control were the women without prolapse with at least one parity in neighborhood matched with age. A total of 230 respondents (1 Case:1 Control) were included in the study. A semi structured interview was carried out to obtain the information for both groups. Bivariate analysis along with conditional logistic regression analysis was carried out to identify the association between selected variables with pelvic organ prolapse.

Results: We found a significant association between age at first child birth (OR 1.98, CI 1.06-3.68), heavy load carrying during pregnancy (OR 3.97, CI 1.93-8.16), smoking (OR 3.49, CI 1.42, CI 8.61) and history of constipation (OR 3.57, CI 1.13-11.22) with pelvic organ prolapse.

Conclusions: The finding showed that the significant factors for prolapse were age at first child birth, heavy load carrying during pregnancy, smoking and history of constipation.

Keywords: Associated factors; case control study; matching; pelvic organ prolapse

INTRODUCTION

The pelvic organs are held inside the pelvic cavity by various ligaments, muscles and connective tissues which are collectively known as the pelvic floor. Weakening or damaging of this pelvic floor by any means causing one or more of the pelvic organs to fall downward into or out of the vagina result in pelvic organ prolapse.[1] Pelvic organ prolapse (POP) affects millions of women worldwide. A number of risk factors have been identified for the development of POP such as prolonged or difficult labour; higher numbers of births; strain on pelvic muscles; hormonal changes after menopause; inappropriate birthing practices.[2] Pelvic organ prolapse is a major public health problem in Nepal. It is a medical and social problem, deeply rooted with poor health services and socio-cultural beliefs. This study was done with the objective to find out the risk factors associated with pelvic organ prolapse.

METHODS

A case control study was conducted in the eastern region of Nepal from September 2015 to August 2016 to identify the risk factors associated with pelvic organ prolapse. Cases were women aged ≥15 years with at least one parity having stage 2 and above pelvic organ prolapse (POP) attending Gynecology OPD in BP Koirala Institute of Health Sciences (BPKIHS) during regular OPD hours. Controls were women without POP with at least one parity in neighborhood of respective cases matched with age.

The sample size was determined using the proportion difference approach with the assumption of 95 % confidence level (Z = 1.96), 80 % power (Z = 0.84), control to case ratio 1:1 (r = 1). The final sample size was 230. A total of 115 cases and 115 controls participated in the study in which cases and controls were taken in a

Correspondence: Dr Dharti Joshi, Department of Immigration Medical Examination, Norvic International Hospital, Kathmandu, Nepal. Email: joshi_dharti@yahoo.com, Phone: +9779842528587.

ratio of 1:1.

The participants were recruited based on inclusion and exclusion criteria. Women aged ≥15 years with at least one parity were included in the study and those who were not willing to participate in the study were excluded. Face to face interview using semi structured questionnaire was conducted for data collection.

The information was collected on presumed risk factors for pelvic organ prolapse. SPSS version 17.0 was used for data analysis. Chi square and conditional logistic regression were used to determine the association of POP and its various factors.

Ethical clearance was obtained from Ethical review board, BPKIHS prior to the study. The purpose of the study and procedures was explained and written informed consent was obtained before commencing the interview. All information were kept confidential and consent forms were number coded for identification.

RESULTS

In this study, among cases; minimum and maximum age at the onset of prolapse was 18 years and 81 years respectively.

Table 1 shows the characteristics of cases and controls. Out of the total study participants, majority of them were at age group 51-65 years, belonged to Hindu religion and Janajati ethnicity.

Women with higher educational status were found more in the control group. Cases were more involved in agriculture whereas many controls were housewives. Regarding economic status, most of the women were living below poverty line and majority of them belonged to joint family.

Table 1. Sociodemographic characteristics of the cases and controls (n=230).

Characteristics	Category	Group Cases n=115 (%)	Controls n=115 (%)
Age in years	21-35	6 (5.2)	8 (7.0)
	36-50	34 (29.6)	36 (31.3)
	51-65	47 (40.9)	44 (38.3)
	> 65	28 (24.3)	27 (23.5)
	Mean Age (years) ± SD	55.60 ± 13.08	55.18 ± 13.06
Religion	Hindu	86 (74.8)	96 (83.5)
	Kirat	17 (14.8)	12 10.4)
	Others	12 (10.4)	7 (6.1)

Ethnicity	Janjati	66 (57.4)	57 (49.6)
	Brahmin/ Chhetri	33 (28.7)	40 (34.8)
	Madhesi	10 (8.7)	11 (9.5)
	Dalit	6 (5.2)	7 (6.1)
Education	Illiterate	76 (66.1)	69 (60.0)
	Informal	14 (12.2)	17 (14.8)
	Primary School	10 (8.7)	9 (7.8)
	Lower secondary	5 (4.3)	6 (5.2)
	Secondary & above	10 (8.7)	14 (12.2)
Occupation	Housewives	62 (53.9)	69 (60.0)
	Agriculture	43 (37.5)	33 (28.7)
	Sales & services	5 (4.3)	8 (7.0)
	Others	5 (4.3)	5 (4.3)
Economic status	Below poverty line (<$1.25)	71 (61.7)	62 (53.9)
	Above poverty line (≥$1.25)	44 (38.3)	53 (46.1)
Family Type	Joint	67 (58.3)	71(61.7)
	Nuclear	48 (41.7)	44 (38.3)

Bivariate analysis between risk factors and pelvic organ prolapse shows that sociodemographic and socioeconomic variables were not found to be significantly associated with pelvic organ prolapse in this study.

It was found that cases who currently smoke were 3.28 times (OR 3.28, CI 1.41-7.66) more likely to have prolapse and found to be statistically significant. Women who had their first child before 20 years of age were nearly two times (OR 1.92, CI 1.09-3.39) more likely to have POP and found to be statistically significant. Likewise, women with parity three and more were 2.24 times more likely (OR 2.24, CI 1.13-4.46) to have POP as compared to women with less than three parity and found to be statistically significant. Strong association was found between h/o carrying heavy loads during pregnancy with POP. Women who carried heavy load during pregnancy were 3.5 times more likely to have POP (OR 3.5, CI 1.82-6.91). Resumption of strenuous postpartum activity in less than six weeks were found to be associated with POP. Likewise, women carrying heavy load daily in past were also found to be significantly associated with POP. There was an increased risk of having POP by 5.5 times in those who had carried heavy load in past (OR 5.5, CI 2.01-15.04) which was statistically significant and those who carried heavy load daily were 4.6 times likely (OR 4.6, CI 1.95-11.03) to have prolapse. Women who had history of constipation in past were three times more likely to have POP and found to be statistically significant in both

bivariate and multivariate analysis. In this study, most of the women had menopause, with similar distribution among case and control group. Menopause increased the odds of having POP by 1.09 times (OR 1.09, CI 0.61-1.95) which was not significant. Cases who had family history of prolapse were 2.32 times (OR 2.32, CI 0.78-6.92) likely to have POP which was not statistically significant (Table 2).

The variables which were significantly associated with the pelvic organ prolapse with p value less than 0.2 from bivariate analysis were included into conditional logistic regression (Table 3). The findings are interpreted with the help of odds ratio and 95% confidence interval. Significant association (p value <0.05) was detected between age at first child birth (before 20 years), carrying heavy load during pregnancy, history of constipation and smoking with POP after controlling for other confounding variables.

Table 2. Bivariate analysis between risk factors and Pelvic organ prolapse (n=230).

Characteristics	Category	Group		p-value	OR	95% CI
		Cases (%)	Controls (%)			
Smoking	Current smoker	22 (19.2)	9 (7.8)	0.006*	3.28	1.41-7.66
	Past smoker	35 (30.4)	28 (24.4)	0.091	1.68	0.92-3.06
	Never	58 (50.4)	78 (67.8)		Ref.	
Age at 1st child birth in years	< 20	44 (38.3)	28 (24.3)	0.023*	1.92 Ref.	1.09-3.39
	≥ 20	71 (61.7)	87 (75.7)			
Number of Gravida	≥ 3	100 (87.0)	89 (77.4)	0.058	1.94 Ref.	0.97-3.90
	< 3	15 (13.0)	26 (22.6)			
Number of Parity	≥3	100 (87.0)	86 (74.8)	0.019*	2.24 Ref.	1.13-4.46
	<3	15 (13.0)	29 (25.2)			
Carrying heavy load during pregnancy	Yes	100 (87.0)	75 (65.2)	0.001*	3.55	1.82-6.91
	No	15(13.0)	40 (34.8)			
Resumption of postpartum activity in weeks	< 6	106 (92.2)	95 (82.6)	0.029*	2.48	1.07-5.70
	≥ 6	9 (7.8)	20 (17.4)			
Postpartum activity in < 6 weeks	Strenuous	(n=106) 79 (74.5)	(n=95) 52 (54.7)	0.001*	3.53	1.95-6.41
	Light	27 (25.5)	43 (45.3)			
Carrying heavy load	Yes	110 (95.7)	92 (80.0)	0.001*	5.50	2.01-15.04
	No	5 (4.3)	23 (20.0)			
Family h/o Prolapse	Yes	11 (9.6)	5 (4.3)	0.120	2.32	0.78-6.92
	No	104 (90.4)	110 (95.7)			
Constipation	Present	14 (12.2)	5 (4.3)	0.031*	3.05 Ref.	1.06-8.76
	Absent	101(87.8)	110 (95.7)			
Chronic cough	Present	10 (8.7)	6 (5.2)	0.300	1.73	0.60-4.92
	Absent	105 (91.3)	109 (94.8)			
Menopause	Yes	85 (73.9)	83 (72.2)	0.766	1.09	0.61-1.95
	No	30 (26.1)	32 (27.8)			

* Significant at p-value <0.05

Table 3. Conditional logistic regression analysis for factors associated with Pelvic organ prolapse (n=230).

Variable in equation	Categories	ß coefficient	p-value	Adjusted Odds ratio#	95% C.I
Age at 1st child birth in years	< 18	0.685	0.030	1.98	1.06 - 3.68
	≥ 18	Ref.			

Heavy load during pregnancy	Yes	1.380	0.001	3.97	1.93 - 8.16
	No	Ref.			
Constipation	Yes	1.273	0.029	3.57	1.13 – 11.22
	No	Ref.			
Smoking	Current smoker	1.252	0.006	3.49	1.42 - 8.61
	Past smoker	0.207	0.531	1.23	0.64 – 2.34
	Never	Ref.			
Constant		-1.597	0.001	0.202	

\# Adjusted for age at last child birth, number of gravida, number of parity, early resumption of postpartum activity, family history of prolapse, body mass index, Alcohol consumption, delivery by Health worker & TBA and heavy load carrying in past.

DISCUSSION

Pelvic organ prolapse is a major reproductive health issue in Nepal and sensitive topic among women, families and communities because of lack of knowledge and cultural taboo.

In Nepal, women engage in hard work, including heavy lifting with little or no rest during pregnancy or the postpartum period and at the same time they undergo multiple pregnancies during their reproductive age that consequently increases the risk of POP. Postnatal care and institutional deliveries are not common in Nepal. All these factors are directly playing role in the development of POP.[3] In Nepal, uterine prolapse is the priority one program of the Government. Every year government has allocated funds for management of POP including free screening, the silicon ring pessary and Kegel's exercise training at district level and free surgical services at designated hospitals.[4]

In this case control study, we aimed to find the factors associated with pelvic organ prolapse. The bivariate analysis performed in this study identified association between age at first child birth, age at last child birth, number of parity, heavy load carrying during pregnancy, early resumption of postpartum activity, heavy loads carrying in past, smoking, h/o constipation with POP. Few variables found to be significant in conditional logistic regression analysis were age at first child birth, heavy load carrying during pregnancy, h/o constipation and smoking.

Economic status affects health-related decision making, as well as accessibility of health services and work load of the women. In a study by Bijalwan et al[5] the higher burden of uterus prolapse was found in those with poor economic background. In present study, majority of the respondents were living below the poverty line.

In present study the two groups differed in their educational status. Women with higher educational status were found more in the control group. In a study by Gautam et al. the role of education was found to be quite strong (p<0.001).[6] This is probably because of better health and living conditions of educated women compared to those who have none or minimal education.[7] Teenage pregnancy and motherhood is a major social and health issue in Nepal. An early start to childbearing greatly reduces women's educational and employment opportunities and is associated with higher levels of fertility.[8] The multivariate analysis of the present study showed that risk of having prolapse was nearly two times higher in women with age less than 20 years at birth of first child. Similar finding was observed in other studies.[9,10]

Many studies have showed that risk factor for POP increases with parity, which was also supported by bivariate finding of this study. The risk of POP increases with the number of increased parity. Each time a woman gives birth, the pelvic and vaginal muscles stretch and gets weakened.

Heavy lifting is a daily norm for the majority of women in Nepal. Lifting heavy objects and carrying heavy loads can strain the pelvic muscles particularly during pregnancy and soon after women give birth. Repetitive heavy lifting can cause considerable damage to structural tissues that suspend organs in the pelvic cavity. In a study by Bodner-Adler et al, majority of patients (87%) reported that they were working heavily during pregnancy.[11] In this study, strong association was found between heavy load carrying during pregnancy with POP. This study support other studies that have found an association between heavy work and POP. [12-14]

Women who marry while in their teen years may become pregnant at an early age. The multivariate analysis of the present study showed that risk of having prolapse was nearly two times higher in women with age less than 20 years at birth of first child. In a study done by Paudyal et al, the risk of prolapse was higher in women with age

<20 years at birth of first child.[15]

Other than obstetric factors, some other factors like smoking and chronic constipation were also significantly associated with POP in this study.

Chronically increased intraabdominal pressure is believed to be a clinically relevant factor in the pathogenesis of prolapse. It may be the result of obesity, chronic constipation, chronic coughing, or repetitive heavy lifting.[16]

In this study, constipation showed significant association with POP in multivariate analysis. In the multivariable model of the study at Kaiser, constipation was independently and significantly associated with symptomatic prolapse (OR 2.5).[17]

Smoking and POP seem to be associated because chronic cough due to smoking increases the pressure in the abdomen and pelvis. Smoking alone reduces collagen and can increase the chances of a connective tissue tear. A significant increased risk of POP was observed with smoking in the multivariate analysis of present study.

The present study was conducted in the eastern region of Nepal with small sample size. So, the result of the study may not reflect the exact scenario of the country regarding the factors associated with pelvic organ prolapse. So, the findings of this study could not be generalized and there could have been a recall bias because of the retrospective nature of the study.

CONCLUSIONS

Factors such as age at first child birth, heavy load carrying during pregnancy, constipation and smoking were found to be significantly associated with the pelvic organ prolapse after adjusting for other variables where the presence of the above risk factors increases the risk of POP.

ACKNOWLEDGEMENTS

REFERENCES

1. Harris TA, Bent AE. Genital prolapse with and without urinary incontinence. J Reprod Med. 1990;35(8):792-798.[PubMed]

2. Kuncharapu I, Barbara AM, Dallas WJ. Pelvic Organ Prolapse. Am Fam Physician. 2010;81(9):1111-1117.

3. Amnesty International 2014. Unnecessary Burden: Gender Discrimination and Uterine Prolapse in Nepal.[FullText]

4. Department of Health Services, 2015. Annual Report. https://dohs.gov.np/category/annual-report/

5. Bijalwan RP, Bhagavatula M, Semwal VD, Rawat P, Anand V. Morbidity of uterine prolapsed among the women in the Chakrata Block of Dehradun District. Indian J Community Health. 2015; 27(01):103-109.[Link]

6. Gautam S, Adhikari RK, Dongol A. Associated Factors for Uterine Prolapse. J Nepal Health Res Counc. 2012;10(20):1–4.[PubMed]

7. Parazzini F. Risk factors for genital prolapse in non-hysterectomized women around menopause Results from a large cross-sectional study in menopausal clinics in Italy. Eur J Obstet Gynecol Reprod Biol. 2000;93 (2):135–140.[PubMed]

8. Nepal Demographic and Health Survey 2016. https://www.dhsprogram.com/pubs/pdf/fr336/fr336.pdf

9. Pandit U, Malla DS, Sharma PK. Age as risk factor associated in the genesis of uterovaginal prolapse. Nepal Journal of Obstetrics and Gynaecology. 2008; 3(2):48-50.[FullText]

10. Moalli PA, Ivy SJ, Meyn LA, Zyczyvski HM. Risk factors associated with pelvic floor disorders in women undergoing surgical repair. Am J Obstet Gynecol. 2003;101(5):869-74.[PubMed]

11. Bodner-Adler B, Shrivastava C, Bodner K. Risk factors for uterine prolapse in Nepal. Int Urogynecol J Pelvic Floor Dysfunct. 2007; 18(11):1343–6.[PubMed]

12. Pokharel B, Jain V, Gupta N. Study on Factors Contributing Uterine Prolapse among Women attending Gynecology OPD in Kathmandu, Nepal. Int J Health Sci Res. 2016; 6(1):387–391.[FullText]

13. Jorgensen S, Hein HO, Gyntelberg F. Heavy lifting at work and risk of genital prolapse and herniated lumbar disc in assistant nurses. Occup Med. 1994; 44(1):47–9.[PubMed]

14. Larsen WI, Yavorek T. Pelvic prolapse and urinary incontinence in nulliparous college women in relation to paratrooper training. Int J Urogynecol J Pelvic Floor Dysfunct. 2007; 18(7):769–71.[PubMed]

15. Paudyal P, Pradhan N, Ojha N. Reproductive Risk Factors in Uterovaginal Prolapse : A Case Control Study. Journal of Institute of Medicine. 2015; 31(1):39–43.[Link]

16. Schaffer JI, Wai CY, Boreham MK. Etiology of pelvic organ prolapse. Clin Obstet Gynecol. 2005; 48(3): 639–647.[PubMed]

17. Rortveit G, Brown JS, Thom DH, Van Den E SK, Creasman JM, Subak LL. Symptomatic Pelvic Organ Prolapse: prevalence and risk factors in a population-based, racially diverse cohort. Obstet Gynecol. 2007; 109(6):1396–1403.[PubMed]