

# Non- reproductive Risk Factors of Uterovaginal Prolapse- the Lesser Known Perils

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**Received:** January 22, 2016 ; **Accepted:** May 5, 2016

**Aims:** The aim of this study was to analyze the non-reproductive risk factors associated with uterovaginal prolapse (UVP) which is a major health concern of women.

**Methods:** This was a hospital-based case control study, carried out in the Gynaecology Department of Tribhuvan University Teaching Hospital (TUTH) over one year from 13th April 2011 to 12th April 2012). Cases comprised of 116 women with UVP, second degree or more and controls were women without prolapse of the same age group within five years admitted subsequently after the cases. The variables studied were medical disorders like chronic obstructive pulmonary disease (COPD)/chronic cough, constipation; smoking, family history of prolapse and body mass index (BMI). The p-value and Odds Ratio (OR) for each risk factor were calculated. Multivariate analysis was done for those risk factors found to be significant from the univariate analysis.

**Results:** Smoking, family history of prolapse and low BMI were found to be significant risk factors from univariate analysis. Only two risk factors- family history of prolapse with OR 5.52 (2.11-14.49) and being underweight with OR 15.38 (1.88-125), were found to be significant by multivariate analysis.

**Conclusions:** Providing good nutrition and preventing malnourishment in postmenopausal women, imparting awareness about increased risk in women with history of prolapse in first degree relatives and educating about the perils of smoking could contribute in reducing morbidity due to prolapse.

**Keywords:** non- reproductive, risk- factors, uterovaginal prolapse

## INTRODUCTION

Pelvic organ prolapse (POP) is a bulge or protrusion of pelvic organs and their associated vaginal segments into or through the vagina.<sup>1</sup> Up to half of the normal female population will develop uterovaginal prolapse during their lifetime and twenty percent of these will be symptomatic needing treatment. It rarely results in severe morbidity or mortality; rather, it causes symptoms of the lower genital, urinary, and gastrointestinal tracts that can affect a woman's daily activities and quality of life.<sup>2</sup>

Uterovaginal prolapse (UVP) is a major concern throughout the world. According to Nepal Demographic and Health Survey 2006, up to 7% of women of reproductive age group (15-49 years) were suffering from uterine prolapse. The United Nations

Population Fund (UNFPA) states one in ten Nepalese women suffers from UVP.<sup>3</sup>

The cause of this disorder is likely to be multifactorial; attributable to a combination of risk factors.<sup>4</sup> Vaginal childbirth, young age at first childbirth, frequent childbirths, advancing age, and increasing body-mass index are the most consistent risk factors associated with prolapse.<sup>5-10</sup> While the reproductive risk factors are mostly blamed, other non-reproductive factors like family history, obesity, smoking, medical disorders like chronic cough/ chronic obstructive pulmonary disease (COPD), constipation are also emerging as important risk factors in the West where reproductive factors are on a decline.<sup>11,12</sup> This study was done to see whether the non-reproductive factors play a role in causation of prolapse in our women.

## METHODOLOGY

It was a hospital based case control study carried out in the Department of Gynecology and Obstetrics, Tribhuvan University Teaching Hospital (TUTH), a tertiary level referral centre, Maharajgunj, Kathmandu over one year from 13<sup>th</sup> April 2011 to 12<sup>th</sup> April 2012. All the women who were admitted to the gynecology

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ward of TUTH with the diagnosis of second and third degree UVP or procidentia for conservative management or surgery were taken as cases for the study. Women of similar age group (within five years) as the cases, admitted just after the case for reasons other than prolapse in the female surgical ward were taken as controls. Women with prolapse associated with pregnancy, post hysterectomy vault prolapse, prolapse associated with gynecological malignancies were excluded. Patients were explained in detail about the study being performed. Those giving an informed consent were enrolled. The variables studied were non-reproductive factors - medical illnesses (chronic cough/COPD, chronic constipation), smoking, family history of uterovaginal prolapse and body mass index (BMI). The data analysis was done using SPSS 18 software. To determine the statistically significant risk factors; the Chi square test was used for qualitative data and t-test for quantitative data. Odds Ratio (OR) for each risk factor was calculated. P value was taken as significant if  $<0.05$ . Multivariate analysis was done for those risk factors which had been found to be significant from the univariate analysis.

## RESULTS

During the data collection over a period of one year, there were a total of 116 cases admitted with the diagnosis of second and third degree UVP or procidentia and 116 women without UVP, age-matched within five years of the cases were taken as controls with case to control ratio of 1:1. Prevalence of uterovaginal prolapse cases of second degree or more among total gynecological admissions was 10.4%. Most of the cases 69 (59%) had third degree UVP, 44 (38%) had second degree while only three (3%) cases had procidentia (Fig 1). Maximum cases 36 (31.8%) were in the age group of 51-60 years (Fig.2). Majority of the women among the cases as well as the controls belonged to the Indo-Aryan race. Housewives were predominant in both groups. The groups were comparable in terms of occupation (p value= 0.393). The two groups significantly differed in their educational status (p value= 0). Among the cases 88 (75.8%) were illiterate compared to 51 (44%) controls. Women with higher educational status were found more in the control group (Table 1). The age at the onset of prolapse was 50-59 years in 41 (35.3%)

cases. Most patients 45 (38.8%) came for treatment within five years; one third i.e. 34 (29.5%) came after 11-20 years of having prolapse.

**Table 1. Socio-demographic characteristics of the women.**

Profile	Case (%) n=116	Control (%) n=116	P value	
Ethnicity	Indo-Aryan	91(78.4)	79(68.1)	0.075
	Tibeto-Burman	25(21.6)	37(31.9)	
Occupation	Housewife	107(92.2)	105(90.5)	0.393
	Farmer	7(6)	6(5.17)	
	Laborer	1(0.9)	0	
	Service	1(0.9)	3(2.6)	
	Others	0	2(1.7)	
Education	Illiterate	88(75.8)	51(44)	0.00
	Literate	20(17.3)	31(26.7)	
	Primary education	4(3.4)	15(13)	
	Secondary education	3(2.6)	17(14.6)	
Higher secondary	1(0.9)	2(1.7)		

Among the risk factors studied smoking history, family history of prolapse and being underweight were found to be significant risk factors for development of UVP (p value  $<0.05$ ). Women who smoked had an almost three times the risk of having uterovaginal prolapse as compared to non smokers (OR 2.88, 95% CI 1.7-4.9). There was more than eight fold higher chance of having prolapse if one had a first degree relative with prolapse as compared to those who did not (OR 8.58, 95% CI 3.4-21.3). The risk of having prolapse was fourteen times higher in women who were underweight as compared to those with normal BMI (OR 14.16, 95% CI 1.8-109.6) while being overweight/obese ( $BMI \geq 25 \text{ kg/m}^2$ ) was found to have protective effect i.e. they had less chance of having prolapse (OR 0.346, 95% CI 0.16-0.73).

Women with history of chronic cough/ COPD were 2.5 times more likely to have prolapse, (OR 2.56, 95% CI 0.87-7.5) and the risk of having prolapse was found to be increased three times in women with chronic constipation compared to women without history of constipation (OR 3.16, 95% CI 0.83-12.01). But the difference was not significant (p value  $>0.05$ ). (Table 2)

**Table 2. Odds Ratio (OR) of risk factors.**

Risk factors	Cases n=116	Controls n=116	Total (%) n=232	P value	Unadjusted OR (95% CI)
COPD/chronic cough					
Yes	12(10.3%)	5(4.3%)	17(7.3%)	0.078	2.56(0.87-7.52)
No	104(89.7%)	111(95.7%)	215(92.7%)		1
Constipation					
Yes	9(7.7%)	3(2.6%)	12(5.2%)	0.075	3.16(0.83-12.01)
No	107(92.3%)	113(97.4%)	220(94.8%)		1
Smoking					
Smoker	72(62%)	42(36.2%)	114(49.1%)	0.00	2.88(1.7-4.9)
Non- smoker	44(38%)	74(63.8%)	118(50.9%)		1
Family history of prolapse					
Yes	37(32%)	6(5.2%)	43(18.5%)	0.00	8.58(3.45-21-32)
No	79(68%)	110(94.8%)	189(81.5%)		1
BMI					
Underweight	15(12.9%)	1(0.9%)	16(6.9%)	0.00	14.16(1.83-109.58)
Normal	90(77.6%)	85(73.3%)	175(75.4%)		1
Overweight/obese	11(9.5%)	30(25.8%)	41(17.7%)		0.34(0.16-0.73)

The four risk factors which were found to be significant from the univariate analysis were again analyzed with multivariate analysis controlling for the confounding factors. Only two risk factors i.e. family history of prolapse and being underweight were found to be significant by the multivariate analysis. (Table 3)

**Table 3. Multivariate analysis of risk factors.**

Risk factors	Multivariate OR(95% CI)	P value
Smoking	1.40(0.74-2.67)	0.299
Family history of prolapse	5.52(2.11-14.49)	0.000
BMI- Underweight	15.38(1.88-125)	0.011

## DISCUSSION

Comparing risk of uterovaginal prolapse among women with history of chronic cough/ COPD to that among women who did not have them, the first group was two and a half times more likely to have prolapse (OR 2.56 95% CI 0.87-7.5). Bodner et al found 35% of women in their study with prolapse had COPD which is three times higher than in this study.<sup>10</sup> It was a study conducted in a purely rural area where use of firewood for fuel is common and hence women complain more of chronic cough. Other studies mostly from developed world found no association between COPD and prolapse.<sup>5,8,9,13</sup> The contrasting

finding is probably a reflection of the better health status of women in the developed countries as well as the fact that Nepal has a large percentage of female smokers especially in the rural areas, causing cough and chronic respiratory diseases.

In this study, risk of having prolapse was found to be increased in women with chronic constipation compared to women without history of constipation, OR 3.16 (95% CI 0.83-12.01). Arya et al showed that repetitive straining in patients with chronic constipation was a risk factor for POP.<sup>12</sup> But Swift et al found no association between constipation and prolapse.<sup>13</sup>

In the present study OR for having uterovaginal prolapse was 2.8 (95% CI 1.7-4.9) for women who smoked as compared to non smokers. But some other studies found no association between smoking and prolapse<sup>7-9</sup> whereas Hendrix et al found lower risk of prolapse with current smoking and no association was found with past smoking.<sup>5</sup>

If one had a first degree relative with prolapse one was more than eight times likely to have prolapse as compared to those who did not have a family history (OR 8.58, 95% CI 3.4-21.3) in this study. Similar results were found in other studies. According to Chiaffarino et al if there was history of prolapse in

mother or sister the woman was two to three times more likely to suffer from the condition.<sup>9</sup> Pandit et al reported first degree family history to be a risk factor for prolapse, OR 2.35. In this study a first-degree family history seemed to be a significant risk factor for uterovaginal prolapse. However, this must be interpreted carefully, since the possibility of information bias cannot be excluded. Cases of prolapse may tend to recall a family history of prolapse more accurately than controls.

The risk of having prolapse was found to be fourteen times higher in women who were underweight as compared to those with normal BMI (OR 14.16 95% CI 1.8-109.6) in this study. Being overweight/obese was seen as a protective factor for prolapse in this study (OR 0.34, 95% CI 0.163-0.734).

Literature shows conflicting results of relationship of BMI with prolapse. Hendrix et al found that obesity is strongly associated with higher risk for prolapse. Being overweight (BMI 25-30kg/m<sup>2</sup>) was associated with increase in uterine prolapse by 31% and being obese (BMI>30kg/m<sup>2</sup>) by 40%.<sup>5</sup> Similarly Progetto Menopausa Italia Study Group reported that in comparison with women with normal BMI, OR for prolapse was 1.4 and 1.6 for women who were overweight and obese, respectively.<sup>8</sup> However,

Chiaffarino et al and Swift et al found no association between BMI and prolapse.<sup>9,13</sup>

In contrast to these studies, Gurung et al found that among the rural Nepalese women, malnutrition was a dominant risk factor for uterine prolapse.<sup>14</sup> Pandit et al reported that though cases were more likely than controls to have a low BMI<18kg/m<sup>2</sup>, it was not statistically significant.<sup>7</sup>

Studies from the West show increased risk of prolapse with increasing BMI but studies in our part of the world including the present study show that being underweight is a significant risk factor for prolapse. This difference is probably a reflection of the difference in nutritional status of the women, obesity becoming an epidemic in the West while our women are still malnourished.

## CONCLUSION

The non reproductive risk factors of UVP like smoking, family history, low BMI were found to be significant in causation of prolapse in this study. Hence, providing good nutrition and preventing malnourishment in postmenopausal women, imparting awareness about increased risk in women with history of prolapse in first degree relatives and educating about the perils of smoking could contribute in reducing morbidity due to prolapse.

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