International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Kose V et al. Int J Reprod Contracept Obstet Gynecol. 2022 Apr;11(4):1198-1202
www.ijrcog.org
pISSN 2320-1770 | eISSN 2320-1789

DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20220904

Original Research Article

Association between body mass index and operative morbidity in women undergoing hysterectomy for benign indications: a cohort study

Varsha Kose[1]*, Anjali Kawthalkar[1], Anuja Bhalerao[1], Jaydeep Nayse[2], Sheela Jain[1], Saurabh Kose[3]

[1]Department of Obstetrics and Gynecology, [2]Department of Statistics, [3]NKP Salve Institute of Medical Sciences and Research Center and Lata Mangeshkar Hospital, Nagpur, Maharashtra, India

Received: 15 February 2022
Accepted: 05 March 2022

***Correspondence:**
Dr. Varsha Kose,
E-mail: varshadkose@gmail.com

ABSTRACT

Background: Hysterectomy is the most common gynaecological operation performed in the world. This study was done to investigate association between body mass index (BMI) and operative morbidity in women who underwent hysterectomy for benign indications.
Methods: Total 201 women were studied. 114 (56.7%) had BMI between 20-24.9 and 87 (43.3%) had BMI 25 and above. In both groups, abdominal and vaginal hysterectomy were performed. They were compared for duration of surgery, intraoperative blood loss, postoperative fever, wound infection, secondary haemorrhage, deep vein thrombosis, resuturing and readmission.
Results: Mean duration of surgery in women with BMI 20-24.9 was 2.47 hours, standard deviation was 0.665 and in women with BMI 25 and above was 2.45 hours, and standard deviation was 0.589. T value was 0.215 and p value was 0.83 which is not statistically significant. Mean blood loss during surgery with BMI less than 25 was 184.74 ml, standard deviation was 104.518 and with BMI more than 25 was 200.57 ml, and standard deviation was 77.462. T value was 1.234 and p value was 0.219 which is not clinically significant. Out of 114 women with BMI less than 25, 16 (38.1%) had complications and 98 (61.6%) had no complications. Out of 87 women with BMI more than 25, 26 (61.9%) had complications and 61 (38.4%) had no complications, Chi square test was 7.48, and p value of 0.006 which was clinically significant. It shows that women with BMI 25 and above had more chances of postoperative complications.
Conclusions: There is no statistically significant difference in intraoperative blood loss and duration of surgery in both women with normal BMI and women with BMI 25 and above who underwent hysterectomy. But postoperative complications in terms of wound infection, fever, bleeding, necessity of resuturing and readmission were more in women with BMI 25 and above as compared to women with normal BMI.

Keywords: Hysterectomy, Body mass index, Benign

INTRODUCTION

Hysterectomy is the most common major gynaecological operation in the world. With the increasing prevalence of obesity in the South Asian countries it is becoming increasingly important to characterize the effects of body mass index (BMI) on morbidity following hysterectomy. A high BMI is a risk factor for a number of diseases leading to hysterectomy. However, the studies that have been examined whether BMI is associated with risk of complications after hysterectomy have been inconsistent.

Rasmussen et al found a significant prevalence of complications after vaginal as well as abdominal hysterectomy indicated by non-malignant bleeding disorders but obese patients did not experience an increased risk of serious morbidity compared to normal weight women.[1]

Osler et al concluded that women with a high BMI who underwent hysterectomy on a benign indication have an increased risk of heavy bleeding and infections if they had abdominal hysterectomy. Women with low BMI who have abdominal hysterectomy also had an increased risk of all bleeding complications.[2]

Khavanin et al concluded that obese and overweight patients demonstrated an increased risk for perioperative morbidity following abdominal hysterectomies.[3]

The present study was done to investigate any association between BMI and operative morbidity in women undergoing hysterectomy for benign indications. This will enable us to plan for their better pre, intra and postoperative care.

METHODS

This cohort study was conducted in the department of obstetrics and gynaecology NKP Salve Institutes of Medical Sciences and Lata Mangeshkar Hospital, Hingna Road, Nagpur from August 2016 to August 2018. Institutional ethical committee approval was taken.

Inclusion criteria

Women with BMI more than 20 who underwent hysterectomy through abdominal or vaginal route for benign indications, and minor concomitant procedures such as oophorectomy, ovarian cystectomy, salpingectomy was included in the study.

Exclusion criteria

Hysterectomy done for malignant indications, women with BMI less than 20, previous history of more than 2 caesarian section, and not willing to participate in the study were excluded.

After taking informed and written consent, woman who fulfills the inclusion criteria were included in the study. Their detailed relevant baseline information, obstetrics and gynaecological history was taken. General examination, systemic examination, perabdomen, perspeculum and pervaginal examination was done. Necessary investigations done to reach the clinical diagnosis of benign lesion which required hysterectomy either through abdominal or vaginal route. Their height, weight recorded and BMI calculated. Pre, intra and postoperative care was done according to our hospital protocol. Operation was performed by the faculty in the department.

Assessment of BMI

BMI is calculated as weight in kg divided by height in meter square. Women with a BMI less than 20 is considered as low BMI. BMI 25 and above is considered as overweight and obese. BMI more than 20 to 24.9 is considered as normal.[2]

Sample size calculation

Sample size (n) calculation is done using software Open Epi open source epidemiologic statistics for public health version 3.01, where n is sample size, m is the number of controls per case, $Z_{1-\beta}$ power (0.84 for 80% and 1.28 for 90% power), $Z_{1-\alpha/2}$ is critical value for confidence interval for 95% CI is 1.96, P_0 is prevalence in control (comparison group), and P_1 is prevalence in experimental group

Also, $P = P_1 + m\ P_0/m + 1$

After putting in the values with an AOR for postoperative wound infection in obese and overweight women of 5.4 (95% CI – 3.85 to 7.41) in a study by Kelath et al.[9]

The sample size obtained was 190. Total 201 women were studied for operative morbidity. They were divided into 2 groups. Group 1 consisted of women with BMI 20–24.9 were 114 in number. Group 2 consisted of women with BMI 25 and above were 87 in number.

Duration of surgery and amount of intraoperative blood loss was noted.

They were put under observation till 14th postoperative day for fever, wound infection, secondary haemorrhages, deep vein thrombosis, resuturing and readmission if any required.

All the information was recorded in a proforma. The data was entered in Microsoft excel sheet of investigators personal computer. Accuracy and confidentiality were maintained.

Statistical data

Statistical analysis was done by using EPI info software version 7. For qualitative data frequency and percentage was used. For quantitative data mean and standard deviation was used.

Inferential statistics – for qualitative data Chi-square was used, for quantitative data unpair t test was used, and level of significance p value is less than 0.05.

RESULTS

Out of 201 women, in group 1, 114 (56.7%) women were having normal BMI (20–24.9) and in group 2, 87 women (43.3%) were having BMI 25 and above (Table 1).

Table 1: Distribution of women according to BMI.

BMI	Frequency	Percentage
20–24.9	114	56.7
25 and above	87	43.3
Total	201	100

Out of 201 women 96 (47.8%) underwent abdominal hysterectomy and 105 (52.5%) underwent vaginal hysterectomy (Table 2). Abnormal uterine bleeding was the indication for hysterectomy in 165 (82.1%) women and prolapse of the uterus was the indication in 36 (17.9%) women.

Table 2: Operation performed in both the groups.

Hysterectomy	Frequency	Percentage
Abdominal	96	47.8
Vaginal	105	52.5
Total	201	100

Duration of surgery and intraoperative blood loss. Mean duration of surgery in group 1 was 2.47 hours, standard deviation was 0.665 and in group 2 was 2.45 hours, and standard deviation was 0.589. T value was 0.215 and p value was 0.83 which is not statistically significant.

Mean blood loss during surgery in group 1 was 184.74 ml, standard deviation was 104.518 and in group 2 was 200.57 ml, standard deviation was 77.462, t value was 1.234 and p value was 0.219 which is not statistically significant (Table 3).

Out of 114 women in group 1, 16 (38.1%) had complications and 98 (61.6%) had no complications. Out of 87 women in group 2, 26 (61.9%) had complications and 61 (38.4%) had no complications.

Chi square test was 7.48, and p value of 0.006 which is clinically significant. It shows that women with BMI more than 25 had more chances of complications (Table 4).

Overall complications studied are 35 (17.41%) had post-operative fever, 24 (12%) had wound infection, 12 (6%) had secondary hemorrhage, 10 (5%) needed resuturing and 3 (1.5%) women required readmission (Table 5).

Out of 114 women in group 1, 14 (12.28%) had fever, 6 (5.26%) had secondary haemorrhage, 7 (6.14%) had wound infection, 2 (1.74%) required resuturing and no women needed readmission for any complications.

Out of 87 women in group 2, 21 (24.13%) had fever, 6 (6.89%) had secondary haemorrhage, 17 (19.54%) had wound infection, 8 (9.19%) required resuturing and 3 (3.44%) women needed readmission for management of complication (Table 6).

This shows women in group 2 with BMI 25 and above had more complications as compared to women in group 1 with BMI less than 25. No women had deep vein thrombosis in both the groups which may be because of better perioperative care like non pharmacological measures and use of thromboprophylaxis at our centre.

Table 3: Intraoperative duration of surgery and blood loss in both groups.

Parameters	BMI	N	Mean	Standard deviation	T value	P value
Duration (hours)	>25	87	2.47	0.665	0.215	0.83
	<25	114	2.45	0.589		
Blood loss (ml)	>25	87	200.57	104.518	1.234	0.219
	<25	114	184.74	77.462		

Table 4: Presence of complications in both groups.

BMI	Complication		Total
	Yes	No	
<25			
Count	16	98	114
% Within complication	38.1	61.6	56.7
≥25			
Count	26	61	87
% Within complication	61.9	38.4	43.3
Total			
Count	42	159	201
% Within complication	100.0	100.0	100.0

Table 5: Overall frequency of complications in the present study.

Complication	Frequency	%
Fever	35	17.41
Wound infection	24	12.0
Secondary haemorrhage	12	6.0

Continued.

Complication	Frequency	%
Wound resuturing	10	5.0
Readmission	3	1.5

Table 6: Distribution of different complications in both the groups.

BMI	Fever (%)	Secondary haemorrhage (%)	Wound infection (%)	Resuturing (%)	Readmission (%)
<25	14 (12.28)	6 (5.26)	7 (6.14)	2 (1.74)	0 (0)
≥25	21 (24.13)	6 (6.89)	17 (19.54)	8 (9.19)	3 (3.44)

DISCUSSION

In our study women with BMI 25 and above had overall increased complications in terms of postoperative fever, wound infection, secondary haemorrhage, resuturing and readmission as compared to women with normal BMI 20–24.9. Intraoperative blood loss and duration of surgery was similar in both the groups and not statistically significant.

However, the number of complications in the groups in this study was small and the estimates were not adjusted for any potential confounding factors. The present investigation focuses solely on surgical complications in women with normal BMI and women with BMI 25 and above after abdominal and vaginal hysterectomy for benign indications.

Kjeld et al concluded that abdominal and vaginal hysterectomy have a significant risk of complications but obese patients did not experience an increased risk of serious morbidity compared to normal weight women.[1]

Merete et al concluded that obesity increases the risks of bleeding and infections after abdominal hysterectomy. Obesity was associated with an increased risk of heavy bleeding during surgery (odd ratio=3.64 (2.90–4.56)) and infection (odd ratio=1.66 (1.23–1.77)).[2]

Nima et al concluded that obese and overweight patients demonstrated an increased risk for perioperative morbidity. The incidence of deep vein thrombosis was notably elevated in obese and overweight patients. P value of 0.032 adjusted odd ratio (OR) found both overweight and obese patients to be a significantly higher risk of surgical complications (OR 1.6 and 3.0 respectively) and wound infections (OR 1.7 and 3.0 respectively).[3]

Rafii et al found the overall complication rates were 14% and 16% in obese and non-obese groups respectively (p=0.7). Obesity did not increase the duration of the procedure (p=0.1) or length of hospitalization (p=0.2) as in our study.[4]

Isik-Akbay et al concluded that obese women who underwent abdominal hysterectomy had higher risk of postoperative febrile morbidity, ileus, urinary tract infection, operative time and length of hospitalization as compared to vaginal hysterectomy.[5]

Harmanli et al concluded that obesity does not significantly affect the perioperative outcomes for abdominal hysterectomy performed for benign indications.[6]

Carter et al concluded that overweight and obese patients undergoing a fast-track surgical protocol after laparotomy for gynaecological surgery have similar outcome when compared to patients of normal body mass index.[7]

Mikhail et al concluded that increasing BMI was associated with increased operative time for all subgroups and increased surgical site infection in abdominal hysterectomy group.[8]

Shah et al concluded that obesity is associated with increased wound complications and infection in women undergoing abdominal hysterectomy and with longer operative time regardless of surgical approach. No association were noted between BMI and hospital stay and thromboembolism.[9]

Mitas et al concluded that the mean operative time in obese women was significantly prolonged (p=0.036). However, complication rates and other perioperative outcomes were comparable in both obese and non-obese groups.[10]

CONCLUSION

This cohort study suggests that there is no statistically significant difference in intraoperative blood loss and duration of surgery in both women with normal BMI and women with BMI 25 and above who underwent hysterectomy for benign indications. But postoperative complications in terms of fever, wound infection, secondary haemorrhage, necessity of resuturing and readmission were more in women with BMI 25 and above as compared to women with normal BMI who underwent hysterectomy for benign indications.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Rasmussen KL, Neumann G, Ljungström B, Hansen V, Lauszus FF. The influence of body mass index on the prevalence of complications after vaginal and abdominal hysterectomy. Acta Obstet Gynecol Scand. 2004;83(1):85-8.
2. Osle M, Daugbjerg S. Body mass and risk of complications after hysterectomy on benign indications. Human Reproduction. 2011;26(6):1512-8.
3. Khavanin N, Francis C. The influence of BMI on perioperative morbidity following abdominal hysterectomy. Am J Obstet Gynecol. 2013;208:449.
4. Rafii A, Samain E. Vaginal hysterectomy for benign disorders in obese women: a prospective study. BJOG. 2005;112(2):223-7.
5. Isik-Akbay EF. Hysterectomy in Obese Women: A Comparison of Abdominal and Vaginal Route. Obstetrics & Gynecology. 2004;104(4):710-4.
6. Harmanli O, Dandolu V. The effect of obesity on total abdominal hysterectomy. J Women's Health. 2010;19(10):2010-32.
7. Carter J, Shannon Philp S. Fast track Gynaecology surgery in the overweight and obese patient. Int J Clin Med. 2010;1:64-9.
8. Mikhail E. Association between obesity and the trends of routes of hysterectomy performed for benign indications. Obstet Gynecol. 2015;125(4):912-8.
9. Kelath SD. Association of body mass index and morbidity after abdominal, vaginal and laparoscopic hysterectomy. Obstet Gynecol. 2015;125(3):589-98.
10. Mitas L, Rogulski L. Does obesity complicate perioperative course in patients undergoing abdominal hysterectomy? Arch Gynecol Obstet. 2012;286:385-8.

Cite this article as: Kose V, Kawthalkar A, Bhalerao A, Nayse J, Jain S, Kose S. Association between body mass index and operative morbidity in women undergoing hysterectomy for benign indications: a cohort study. Int J Reprod Contracept Obstet Gynecol 2022;11:1198-202.