

ORIGINAL ARTICLE**Hysterectomy with Bilateral Salpingo-Oophorectomy in Reproductive Age: A retrospective large comparative study**Waleed M. Etman¹, Basem Hamed¹, Sameh Mohamed NaguibAhmed², Ahmed M. Fahmy³, Mohamed Ali Alabiad^{4*}, Sherin A. Shazly¹¹Department of Gynecology and Obstetrics, Zagazig University Faculty of Medicine, Zagazig, Egypt.²Department of General Surgery, Zagazig University Faculty of Medicine, Zagazig, Egypt.³Department of Anesthesia and Intensive care, Faculty of Medicine, Zagazig University.⁴Department of Pathology, Zagazig University Faculty of Medicine, Zagazig, Egypt.**ABSTRACT*****Corresponding author:**

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Background: Hysterectomy and bilateral salpingo oophorectomy (BSO) in premenopausal women causing premature menopause. By contrast it was found that removal of both ovaries could markedly decrease the risk of cancer breast and ovarian cancers completely. Aim of the current study was to assess the indications of total hysterectomy (TH) with or without bilateral salpingo oophorectomy (BSO) in pre-menopausal women with benign gynecological conditions and histo-pathological findings in resected specimens. Additionally we tried to assess the survival and life style benefits of performing oophorectomy or preserving one or both ovaries. **Methods:** we assessed all patients underwent TH with or without BSO in for management of benign gynecological conditions. We divided patients in to 2 groups the first group included patients who underwent TH and BSO the second group included patients underwent TH with conservation of both ovaries. We compared between both groups of patients regarding long term health and survival outcomes. **Results:** Women who underwent BSO were significantly older at surgery compared with women who underwent hysterectomy without oophorectomy ($p < 0.001$). There is a significant agreement between the clinical role and histopathology in detecting ovarian cysts ($p < 0.001$). In case of clinical evidence of ovarian pathology in young females who underwent ovarian preservation, there is a high need for reoperation later on ($p < 0.001$). **Conclusion:** females in the reproductive age who underwent hysterectomy for benign pathological uterine causes, and has no clinical or radiological evidence of ovarian diseases, it should be better to preserve the healthy ovaries to preserve their hormonal function.

Keywords: Total Hysterectomy, Ovarian preservation, Salpingo-oophorectomy

INTRODUCTION

Hysterectomy is considered the commonest performed surgical procedure and ranked as the second performed operation after cesarean section in developing countries [1], Uterine fibroids and resistant abnormal bleeding are the main indications for performing hysterectomy which is commonly accompanied by performing unilateral or bilateral oophorectomy (BSO) [2, 3] Hysterectomy in addition to BSO reduced levels of estrogen and androgen in premenopausal women causing

premature menopause [4], increasing mortality, increasing incidence of hypertension, D.M, dementia, depression, many cancer types, arthritis, chronic renal and lung diseases [5], in addition to cardiovascular diseases [6]. By contrast it was found that removal of both ovaries particularly in premenopausal females could markedly decrease risk of cancer breast [7]. Additionally, BSO removes ovarian cancer risks completely, but there is no scientific evidence for prophylactic roles of performing oophorectomy, except in females with

known genetic mutations for familial ovarian cancer in BRCA1 and BRCA2 genes [8].

Comparative studies which assessed outcomes of females underwent BSO with those without BSO found significant differences in association with mortality [9, 10], but studies assessed effects of BSO on young premenopausal females found an increase in rates of mortality [9], particularly if no hormone replacement therapy (HRT) was used [11]. Moreover, performing unilateral salpingo-oophorectomy (USO) in addition to hysterectomy was found to be associated with a reduction in all cause related mortality and CVD [5, 6]. Therefore, although performing oophorectomy with the hysterectomy in absence of apparent ovarian pathology is frequent but long-term health outcomes and association with premature morbidity and mortality particularly in premenopausal females remain uncertain. The aim of the current study was to assess the indications of total hysterectomy (TH) with or without bilateral salpingo-oophorectomy (BSO) in pre-menopausal women with benign gynecological conditions and histo-pathological findings in resected specimens. Additionally we tried to assess the survival and life style benefits of performing oophorectomy or preserving one or both ovaries.

METHODS

In the present retrospective cohort study we assessed all patients who underwent TH with or without BSO in Gynecology and Obstetrics department and General Surgery Department, Faculty of Medicine, Zagazig University hospitals , in the period from March 2013 to April 2018 after having approval from the research ethical committee of Faculty of Medicine, Zagazig University. The study was done according to The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

Inclusion criteria were females aged from 25-45 years old underwent TH with BSO and TH only for management of benign gynecological conditions who accepted to be included in the study. Exclusion criteria were post menopausal females, females with incomplete data, females with USO and females with histo-pathological diagnosis of any gynecological malignancy. A written informed consent was acquired from all patients.

We reviewed all patients' files and collected the following data: patients' age, general health variables, primary symptoms that enforced patients to seek medical advice clinical indication for performing hysterectomy, type of surgery, the

surgical management of ovaries whether removed unilaterally, bilaterally or preserved. We collected post-operative variables and histo-pathological findings in removed specimens; in the endometrium, myometrium, cervix, ovaries and Fallopian tubes. After application of the inclusion criteria of the study , 100 patients were included and were divided into 2 groups the first group included 50 patients who underwent TH and BSO the second group included 50 patients who underwent TH with conservation of both ovaries. We compared between both groups of patients regarding long term health and survival outcomes to explore the association between hysterectomy with or without oophorectomy.

Regarding the follow-up we couldn't make a long follow-up for many years but we assessed patients' satisfaction of life by making a satisfaction with life questionnaire this 5 items tool that [12] include 7-points scale ranged from 1 strongly disagree to 7 strongly agree. 1 = strongly disagree 2 = disagree 3 = slightly disagree 4 = neither agree nor disagree 5 = slightly agree 6 = agree 7 = strongly agree. 1. In most ways my life is close to my ideal. 2. The conditions of my life are excellent. 3. I am satisfied with my life. 4. So far I have gotten the important things I want in life. 5. If I could live my life over, I would change almost nothing.

STATISTICAL ANALYSIS

Collected data were computerized then analyzed by using Statistical Set for Social Sciences (24Inc, SPSS, Chicago, IL., U.S.A.). Information was verified by normal dispersal by using the Shapiro Walk test. Fisher exact and Chi square (χ^2) test were performed for estimation of differences among the variable quantity.

RESULTS

Table 1 showed comparison between both studied groups of patients regarding their baseline data:

Women who underwent BSO were significantly older at surgery compared with women who underwent hysterectomy without oophorectomy ($p < 0.001$). The frequency of abdominal hysterectomy was 52 % women, laparoscopic hysterectomy was 36% and vaginal hysterectomy was 12%. Vaginal hysterectomies were performed in women with uterine prolapse. The most common clinical indication for hysterectomy was abnormal uterine bleeding (AUB) in 62 % of cases, fibroid

uterus in 14% of cases and adnexal mass in 10% of cases. No statistically significant differences between both groups regarding type or clinical indications of hysterectomy.

Table 2 showed comparison between both groups of studied patients regarding histopathological findings in resected samples.

The endometrium was proliferative in 18%, secretory in 10% of cases, atrophic in 6% of cases. The most common pathological finding in the endometrium was endometrial hyperplasia in 16% of cases followed by endometritis in 12% of cases. In the cervix, chronic cervicitis was observed in 52% of cases. No statistically significant differences between both groups regarding histopathological findings in the endometrium, myometrium or cervix. Ovarian conservation was performed in 50% of cases and BSO was performed in the remaining 50% of cases. Out of resected ovaries, 24% of cases showed normal histology and 26% of cases showed functional cysts. The ovarian pathological findings were serous cyst adenoma (23%), endometriosis (10%), and teratoma in 8% of cases.

Figure (1) showed Pie chart of distribution of the studied patients regarding histopathology of resected ovaries. No pathological changes were identified in fallopian tubes in 95% of cases, chronic salpingitis was reported 2% of cases, hydrosalpinx were found in 2% of cases and endometriosis was found in 1% of cases.

Table 3 denotes degree of agreement between preoperative clinical ovarian findings and histopathological findings in resected ovarian samples in the group of patients underwent oophorectomy. There is statistically significant strong agreement between clinical and histopathology in detecting functional cyst, serous cysts, mucinous cysts, teratoma and endometriosis ($p < 0.001$).

Tables 4 clarify the association between the need for reoperation and histopathology of ovarian lesion: In case of clinical evidence of ovarian pathology in young females who underwent ovarian preservation, there is a high need for reoperation later on ($p < 0.001$).

We found that there is statistically significant difference between the studied groups regarding satisfaction with life which was significantly higher in patients with preserved ovary ($p = 0.028$).

DISCUSSION

In the present study we performed total abdominal and laparoscopic hysterectomy in most of

the included patients and we performed vaginal hysterectomy for women with uterine prolapse similarly [13]. We showed that the most frequent indications for performing total hysterectomy in premenopausal females included in the current study were AUB and fibroid similarly to results of previous studies [11, 14]. The main histopathological findings in resected specimens were; fibroids, adenomyosis in the myometrium, endometrial hyperplasia, polyps and endometritis. Most cases revealed proliferative and secretory patterns in the endometrium, few cases showed endometrial atrophy. BSO was performed in 50% of cases and histopathological evaluation of resected specimens revealed: no pathological abnormalities in most cases and cysts in remaining cases. The main histopathological findings are; serous cyst adenoma, endometriosis and oophoritis. Females who underwent TH and BSO were relatively older than females who underwent preservation of ovaries these results were similar to results of [1, 4, 15].

Findings of our study were similar to results of previous reports that about 30% of females suffered from AUB at any age of their life and risk factors of this annoying problem were increasing age, premenopausal status and the presence of uterine fibroids, endometrial and cervical polyps [16, 17]. Total hysterectomy is recommended for females complaining of resistant AUB that is not responding to conservative and medical therapy [18]. We showed that the commonest histopathological findings in the uterus are: adenomyosis and leiomyoma these results were in line with [14, 19-22].

In the current report after collection of the follow-up findings of patients of both included groups we showed that preservation of the ovaries for females undergoing hysterectomy for treatment of benign causes has a better life style, lower incidence of CHD, hypertension, in addition to more survival benefits which were similar to results of Tuesley et al [3], Rocca et al. [20]. So, our findings and findings of previous reports suggested that ovarian conservation should be performed in females undergoing hysterectomy for AUB in cases of clinical and radiological evidence of normal ovaries Tuesley et al., [3]. There is statistically significant strong agreement between clinical and histopathology in detecting ovarian pathology, denoting that there is no need to perform prophylactic oophorectomy, unless indicated. Moreover we showed that in case of clinical evidence of ovarian pathology in young females who

underwent ovarian preservation, there is a high need for reoperation later on ($p < 0.001$).

In the present reports we excluded all cases with clinical, radiological gross or microscopic evidence of ovarian cancer to excluded cancer related mortality and focus on mortality related to other causes and differences in life style of patients underwent oophorectomy and ovarian conservation, our results were in line with previous studies Rocca et al. [19], Parker et al., [22 and 23] who excluded women who underwent oophorectomy for cancer.

Tuesley et al., [3] and Gierach et al., [9] found that performing hysterectomy with BSO before 45 years of age increased risk of all-cause mortality due to liability to CHD and hypertension, which reflect estrogen deprivation dangers in young females [6, 24].

The protective effects against breast cancer and ovarian cancer of removing the ovaries in premenopausal females need further investigation as it is not proved yet.

CONCLUSIONS

We showed that AUB was the commonest clinical indication for performing hysterectomy in females in the reproductive age. The commonest reported histo-pathology were leiomyoma, adenomyosis, and uterine prolapse. Most of removed ovaries at the time of performing total hysterectomy were found to have normal histology or only functional cysts. So we concluded that for females in the reproductive age who underwent hysterectomy for benign pathological uterine causes and have no clinical or radiological evidence of ovarian diseases, it should be better to preserve the healthy ovaries to preserve their hormonal function.

Points of strength of our study were that it was a histopathology-based study, which is the gold standard in accurate disease diagnosis and the study included large patients number.

Points of weakness and limitations of the study were its retrospective nature where all informations were not acquired from the patients themselves. Additionally, short duration of the study did not allow adequate evaluation of survival outcomes of ovarian preservation or removal of the ovaries.

Table 1: Comparison between both studied groups of patients regarding baseline data.

Parameter	Total (n=10)	Groups		Test	
		TAH without BSO group	TAH with BSO group	χ^2	p
Age group:					
30 - <40 years	38	31 (62)	7 (14)	24.448	<0.001*
≥40 years	62	19 (38)	43 (86)		
Type of hysterectomy				0.444	0.801
TAH	52	26 (52)	26 (52)		
TLH	36	19 (38)	17 (34)		
Vaginal	12	5 (10)	7 (14)		
Indications of hysterectomy:				MC	0.998
Adnexal mass	10	5 (10)	5 (10)		
AUB	62	36 (40)	26 (36)		
Fibroid	14	7 (14)	7 (14)		
Infection	6	3 (6)	3 (6)		
Prolapse	12	5 (10)	7 (14)		
Unexplained pelvic pain	4	2 (4)	2 (4)		

* $p < 0.05$ is statistically significant MC Monte Carlo test

Table 2: Comparison between both studied groups of patients regarding pathological findings in resected samples

Parameter	Total (n=100)	Groups		Test	
		TAH without BSO group	TAH with BSO group	χ	p
Endometrial pathology:					
Atrophic	6	1	5		
Proliferative disorders	18	9	9		
EH	16	6	10		
End-polyp	26	12	14		
Endometritis	12	6	6	-	1
Hormonal effect	8	6	2		
PCOS	4	3	1		
Secretory disorder	10	8	2		
Myometrial pathology:					
Adenomyosis	18	9 (18)	9 (18)		
Fibroid	34	7 (34)	7 (34)		
Fibroid + adenomyosis	18	9 (18)	9 (18)		
Myometritis	22	11 (22)	11 (22)		
Normal	8	4 (8)	4 (8)	-	1
Cervical pathology:					
Cervicitis	52	26 (52)	26 (52)		
Fibroid	20	10 (20)	10 (20)		
Normal	28	14 (28)	14 (28)	-	1
Clinical ovarian findings:					
Endometriosis	10	4 (8)	6 (12)	M	0.277
Functional cyst	26	12 (24)	14 (28)		
Mucinous cyst	9	5 (10)	4 (8)		
Serous cyst	23	9 (18)	14 (28)		
Teratoma	8	3 (6)	5 (10)		
Normal	24	17 (34)	7 (14)		

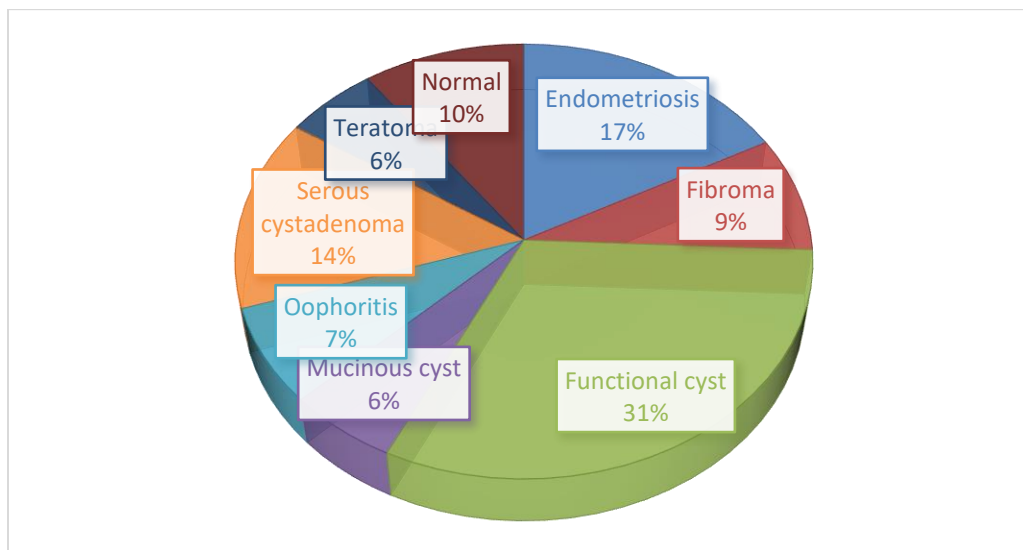


Figure (1) Pie chart showing distribution of the studied patients regarding histopathology

Table 3: Degree of agreement between preoperative clinical ovarian findings and histopathological findings in resected ovarian samples in the group of patients underwent oophorectomy.

	Clinical	Histopathology	K	p
	N=(%)	N=(%)		
Normal	7 (14)	7 (14)	-0.163	0.25
Functional cyst	14 (28)	11 (22)	0.841	<0.001*
Serous cystadenoma	14 (28)	10 (20)	0.674	<0.001*
Mucinous cystadenoma	4 (8)	4 (8)	1.0	<0.001*
Teratoma	4 (8)	4 (8)	1.0	<0.001*
Endometriosis	6 (12)	6 (12)	1.0	<0.001*

Kappa agreement *p<0.05 is statistically significant

Table 4: The association between the need for reoperation and histopathology of ovarian lesions.

Clinical ovarian findings	Reoperation		Test	
	No	Yes	χ ²	p
	N=35 (70%)	N=15 (30%)		
Endometriosis	4 (11.4)	0 (0)	MC	<0.001**
Functional cyst	12 (34.3)	0 (0)		
Mucinous cyst	1 (2.9)	4 (26.7)		
Serous cyst	1 (2.9)	8 (53.3)		
Teratoma	0 (0)	3 (20)		
Normal	17 (48.6)	0 (0)		

*p<0.05 is statistically significant MC Monte Carlo test

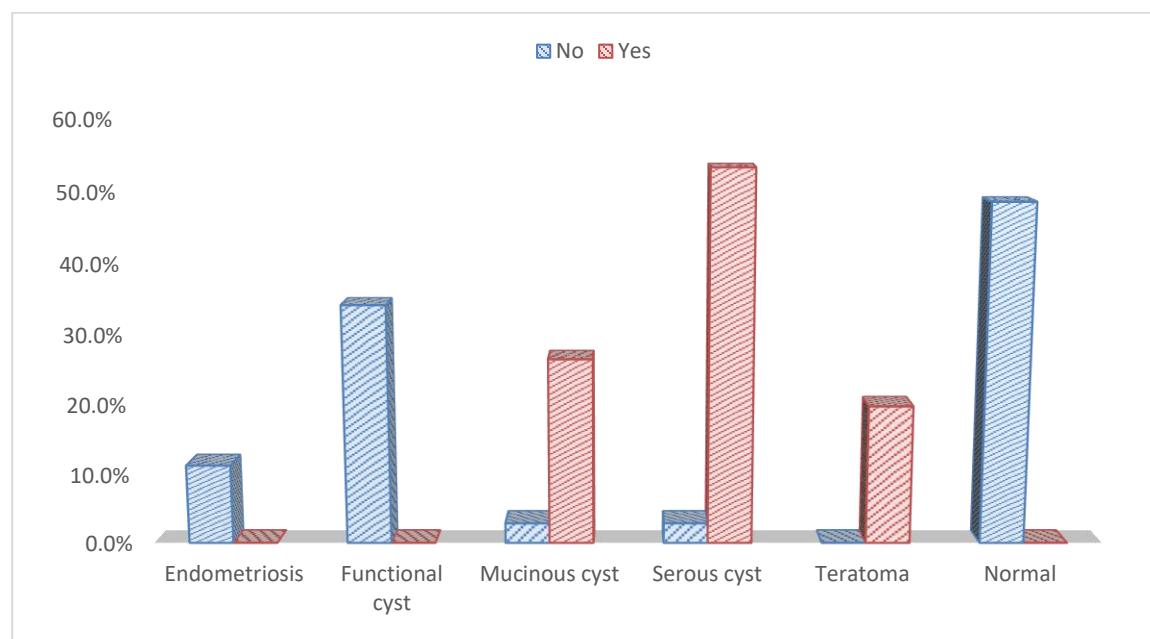


Figure 2: Multiple bar chart showing relation between need for reoperation and pathology of ovarian lesions

Table (5) Relation between preserved ovary and satisfaction with life

SWLS	Ovary		Test	
	Preserved (n=50)	Removed (n=50)	t	p
Mean ± SD	20.58 ± 8.44	17.17 ± 6.74	3.158	0.028*

t independent sample t test *p<0.05 is statistically significant

REFERENCE

- Shahid R, Abbas H, Mumtaz SH, Perveen F, Bari MF, Raja T et al. Hysterectomy and Oophorectomy in Reproductive Age: A Cross-Sectional Study from a Tertiary Care Hospital. *Cureus* 2020; 12(5): e8344.
- Wilson LF, Pandeya N, Mishra GD. Hysterectomy trends in Australia, 000e01 to 2013e14: joinpoint regression analysis. *ActaObstetGynecolScand* 2017; 96:1170–9.
- Tuesley KM, Melinda M. Protani,; Penelope M. Webb,; Suzanne C. Dixon-Suen, Louise F. Wilson, Louise M. Stewart et al. Hysterectomy with and without oophorectomy and all-cause and cause-specific mortality *American Journal of Obstetrics &Gynecology*. 2020; 54:56-68.
- Desai S, Campbell OM, Sinha T, Mahal A, Cousens S: Incidence and determinants of hysterectomy in a low- income setting in Gujarat, India. *Health Policy Plan*. 2017, 32:68-78.
- Rocca WA, Grossardt BR, de Andrade M, Malkasian GD, Melton LJ 3rd. Survival patterns after oophorectomy in premenopausal women:a population-based cohort study. *Lancet Oncol* 2006;7:821–8.
- Rivera CM, Grossardt BR, Rhodes DJ, et al. Increased cardiovascular mortality after early bilateral oophorectomy. *Menopause* 2009;16: 15–23.
- Evans EC, Matteson KA, Orejuela FJ, Memon SH, Ahmed N, Abbas H et al. Salpingo-oophorectomy at the time of benign hysterectomy: A systematic review. *ObstetGynecol* 2016;128:476–85.
- Jacoby VL, Grady D, Wactawski-Wende J, Grossardt BR, Rhodes DJ, Matteson KA et al.: Oophorectomy vs ovarian conservation with hysterectomy: cardiovascular disease, hip fracture, and cancer in the Women's Health Initiative Observational Study. *Arch Intern Med*. 2011, 17:760-768.
- GierachGL, Riboli E, Murphy N, Pfeiffer RM, Patel DA. Long term overall and disease-specific mortality associated with benign gynecologic surgery performed at different ages. *Menopause* 2014; 21:592–601.
- Merritt MA, Riboli E, Mumtaz SH, Perveen F, Bari MF, Murphy N, et al. Reproductive factors and risk of mortality in the European Prospective Investigation into Cancer and Nutrition; a cohort study. *BMC Med* 2015;13:252.
- Wilson LF, Pandeya N, Byles J, Mishra GD. Hysterectomy status and all-cause mortality in a 21-year Australian population-based cohort study. *Am J ObstetGynecol* 2019;220:83. E1–11.
- W. Pavot, E. Diener. The Satisfaction With Life Scale and the emerging construct of life satisfaction. *Psychology*.. 2008

13. Khunte V, Armo A, Gahne R, Sisodiya A, Verma S: Hysterectomy still a treatment of choice for pelvic pathologies in rural India. *Int J Reprod Contracept Obstet Gynecol.* 2018, 7:536-541.
14. Amin A, Ali A, Amin Z, Sani FN: Justification for hysterectomies and frequency of histopathological lesions of hysterectomy at a Teaching Hospital in Peshawar, Pakistan. *Pak J Med Sci.* 2013, 29:170-172.
15. Pradhan SB, Sedhain M, Acharya S, Maharjan S, Regmi S: Clinico-pathological study of hysterectomy specimens in Kathmandu Medical College Teaching Hospital. *Birat J Health Sci.* 2018, 3:423-426.
16. Bonafede MM, Miller JD, Laughlin-Tommaso SK, Lukes AS, Meyer NM, Lenhart GM: Retrospective database analysis of clinical outcomes and costs for treatment of abnormal uterine bleeding among women enrolled in US Medicaid programs. *Clinicoecon Outcomes Res.* 2014, 6:423-426.
17. Parazzini F, Ricci E, Pandeya N, Byles J, Mishra GD, Bulfoni G, et al.: Hysterectomy rates for benign conditions are declining in Lombardy, Italy: 1996-2010. *Eur J Obstet Gynecol Reprod Biol.* 2014, 178:107-113.
18. National Institute for Health and Care Excellence: Heavy menstrual bleeding: assessment and management. NICE Guideline 88 [NG88]. (2018). Accessed: May 9th 2020:
19. Verma D, Singh P, Kulshrestha R: Analysis of histopathological examination of the hysterectomy specimens in a North Indian teaching institute. *Int J Res Med Sci.* 2016, 4:4753-4758.
20. Rocca WA, Mishra GD, Gazzuola Rocca L, Pandeya N, Byles J, Smith CY. Cohort profile: the Mayo Clinic Cohort Study of Oophorectomy and Aging-2 (MOA-2) in Olmsted County, Minnesota (USA). *BMJ Open.* 2017, 7:e018861.
21. Sawke NG, Sawke GK, Jain H: Histopathology findings in patients presenting with menorrhagia: A study of 100 hysterectomy specimen. *J Midlife Health.* 2015, 6:160-163.
22. Parker WH, Broder MS, Liu Z, Shoupe D, Farquhar C, Berek JS: Ovarian conservation at the time of hysterectomy for benign disease. *Obstet Gynecol.* 2005, 106:219-226.
23. Parker WH, Feskanich D, Broder MS, Sawke GK. Long-term mortality associated with oophorectomy compared with ovarian conservation in the nurses' health study. *Obstet Gynecol* 2013;121: 709–16.
24. Sarrel PM, Njike VY, Vinante V, Katz DL. The mortality toll of estrogen avoidance: an analysis of excess deaths among hysterectomized women aged 50 to 59 years. *Am J Public Health* 2013;103:1583–8.

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