Original Article

Study of ovarian function after hysterectomy

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Abstract

Introduction: Hysterectomy is one of the commonest operations performed in the world being second most common surgery in India in reproductive age group. The important concern is impact of hysterectomy on ovarian function and particularly whether loss of ovarian function is associated with long term health risks, including heart disease and osteoporosis.[1,2] Cardiovascular disease is major cause of death in women and given a widespread use of hysterectomy in premenopausal women, this could be a major health concern.[3] The aim of the study is to determine influence of hysterectomy on ovarian function by measuring gonadotropin levels and studying ovarian Doppler in two years period. We also studied bone mineral density preoperatively and postoperatively. **Results:** The mean age of patients undergoing hystertecomy was 40.1 yr and control was 38.1 with no significant difference. The majority of patients in both groups were multiparous 39(86.8%), 37(82.3%) cases and controls respectively. The commonest indication of hysterectomy was fibroid (52%) second being prolapse (32%) We had significant results for symptoms of ovarian hypofunction after hysterectomy. The patients developed symptoms of ovarian hypofunction such as hot flushes mood disturbances. One patient had myocardial infarction and significant number of patients 32% developed osteoporosis after one year. There was 6 times rise in FSH levels than preop in cases as compared to controls. The ovarian failure could be demonstrated by rise in PI value of Ovarian artery. **Conclusion:** The medical consequences associated with ovarian failure are myriad and include higher risk for overall mortality, cardiovascular disease, diabetes, osteoarthritis, certain forms of cancer and depression. During hysterectomy it is advisable not to compromise ovarian blood supply as much as possible Preoperative evaluation, Decision of real need of surgery, regular followup and careful monitoring can help to tackle the problem.

Keywords: hysterectomy, ovarian function, FSH.

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INTRODUCTION

Hysterectomy is one of the commonest operations performed in the world being second most common surgery in India in reproductive age group. There is extensive use of this operation in spite of absence of pathology in more than 50 % of women has raised question regarding merits of this procedure. The important concern is impact of hysterectomy on ovarian function and particularly whether loss of ovarian function is associated with long term health risks, including heart disease and osteoporosis.[1,2] Cardiovascular disease is major cause of death in women and given a widespread use of hysterectomy in premenopausal women, this could be a major health concern.[3] The literature of relationship between hysterectomy and menopause is contradictory some saying earlier menopause[4-9] while other say no association[10]. Studies have used hot flushes as a marker which is nonspecific for gonadotropin levels. The aim of the study is to determine influence of hysterectomy on ovarian function by measuring gonadotropin levels and studying ovarian Doppler for two years period.

MATERIAL AND METHODS

This is a prospective study carried out in a two years duration at PVPGH, Sangli, Maharashtra between Jan 2014 to Jan 2016.

Inclusion Criteria

Women undergoing only hysterectomy for non cancareous condition; Ovarian morphology normal; Women in age group of 30-42 years; Baseline FSH <15miu/ml; BMI <30 KG/M^2

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Exclusion Criteria

Women undergoing hysterectomy for cancareous condition; Postmenopausal Pt; Hysterecomy done for emergency obstetric conditions; BMI >30 KG/M^2; Patients who are already experiencing menopausal symptoms.

The control were those patients who underwent some gynaecological procedure with uterus and ovary intact. We studied 45 patients as test. Comparison between two groups was done using chi square, Fisher exact test (SPSS 21 software).

RESULTS

Table 1

Age Group	Case	Control	Total
Less than or equal to 35	7(15.5%)	16(35.5%)	23
36-40	21(46.6%)	26(57.7%)	47
41-42	17(37.9%)	3(6.8%)	20
Total	**45(100%)**	**45(100%)**	**90**

Table 2: Mean BMI in cases and controls was 21.9 and 21.3 respectively which was comparable in both groups

	Parity			
	Nulliparous	Primipara	Multipara	Total
Cases	2(4.4)	4(8.8)	39(86.8)	45
Controls	2(4.4)	6(13.3)	37(82.3)	45
Total	**4(8.8)**	**10(22.1)**	**76**	**90**

Indications of hysterectomy

- Prolapse- 16(36%)
- Fibroid – 23(52%)
- AUB refractory to medication -3 (6%)
- PID refractory to medication – 3 (6%)
- Commonest route was abdominal followed by vaginal.25 (55%) 20 (45%).

Occurrence of new symptoms at 6 months and 12 months

Table 3: After 6 months

Symptom	Abdominal	vaginal	Total
No symptoms	13	13	26 (58%)
Hot flushes	8	4	12(27%)
Depressed mood	2	2	4(9%)
Anxiety	2	1	3(6%)
Impaired memory	0	0	0
Any cardiovascular complication	0	0	0

Maximum number of patients did not show any symptoms. (58%). 12 patients (27 %) had hot flushes,4 had depressed mood (9%).

Table 4: After 12 months

Symptom	Abdominal	vaginal	Total
No symptoms	6	6	12(26%)
Hot flushes	9	6	15(33%)
Depressed mood	5	2	7(15%)
Anxiety	3	5	8(17%)
Impaired memory	1	1	2(6%)
Any cardiovascular complication	1	0	1(3%)

After 1 yr duration almost all patients had symptoms. (74%).We had one patient who developed myocardial infarction underwent angioplasty. We also did baseline bone mineral density before surgery and compared it after 6 months and one year. The results are as follows:

Table 5: Preoperative

Bone Mineral Density	Control	Case
Normal	32 (71%)	34 (75%)
Osteopenia	12(26%)	10(22%)
Osteoporosis	1(3%)	1(3%)

Table 6: After 6 months

Bone Mineral Density	Control	Case
Normal	30(66%)	22(49%)
Osteopenia	12(26%)	14(31%)
Osteoporosis	3(8%)	9(20%)

Table 7: After 12 months

Bone Mineral Density	Control	Case
Normal	28(62%)	14(31%)
Osteopenia	13(29%)	16(35%)
Osteoporosis	4(9%)	15(34%)

Table 8: Levels of serum FSH

Baseline FSH	Control	8.60
	Cases	8.77
FSH after 6 months	Control	9.10 (1.1`times rise)
	Cases	20.41(2.5 times rise)
FSH after 12 months	Control	10.4 (1.2 times rise)
	cases	50.84 (6 times rise)

After 12 months the difference of FSH values showed statistical significance (p value < 0.01) between cases and controls.

Table 9: Ovarian artery Doppler analysis

Baseline ovarian artery Doppler study	Control	1.86
	Cases	1.84
after 6 months	Control	1.84
	Cases	1.93
after 12 months	Control	1.85
	cases	1.98 significant rise in resistance

After 12 months the difference of PI of ovarian artey values showed statistical significance (p value < 0.01) between cases and controls.

DISCUSSION

The effect of hysterectomy on ovarian function is controversial. Some studies show the prevalence of ovarian failure is high in women who undergo TAH and other say no difference in ovarian function.[11] The uterus inhibits follicular depletion and its removal accelerates follicular loss.[12] One concept is stretching of vessels in infundibulum followed by thrombosis and reduction in ovarian blood supply[11,13,14] With the use of xenon 133 radioisotope to measure ovarian blood supply immediately after TAH, Janson and Janson[15] reported that surgery reduced ovarian clearance by 50- 90% suggesting acute diminution of ovarian blood supply. We performed a prospective comparative study over a period of 2 years between 45 cases and 45 controls to evaluate effect of TAH on ovarian function. The age distribution was comparable with statistically no significant difference. The mean age of patients undergoing hystertecomy was 40.1 yr and control was 38.1 with no significant difference. The majority of patients in both groups were multiparous 39 (86.8%), 37(82.3%) cases and controls respectively. There was no any significant difference. The commonest indication of hysterectomy was fibroid (52%) second being prolapse (32%).The symptomatic fibroids was common in the age group of 38 yrs which is similar to a study of Singapore.[16] The different symptoms corresponding to ovarian failure like hot flushes, depressed mood, anxiety were not significantly seen after 6 months but after 1 yr study 33% patients had hot flushes, 15 % depressed mood 17% anxiety which had significant correlation with p value < 0.05. Even though these symptoms are subjective we had significant results. We studied the bone mineral density by DEXA method and as per results we found that 31 % patients of test group had osteopenia and 20% had osteoporosis after 6 months. The study after one year suggests 35 % osteopenia and 34% osteoporosis. Bone loss in postmenopausal women is mainly due to estrogen deficiency affecting the balance between osteoclast resorption and bone formation controlled by osteoblasts[18] According to one study the bone densities of the hysterectomized women were lower than those of the normal ones, but significantly lower at the Ward's triangle.[19] Serum FSH levels and pulstality index of ovarian artery Doppler analysis showed that FSH levels had significant rise in 1 yr as compared to controls as well as increased PI value at the end of 1 yr showed reduced ovarian blood flow which itself could be reason for reduced ovarian reserve. The hypergonadotropism in hysterectomized women correlates with the higher incidence of climacteric symptoms reported in the literature.[17] In our study we had some limitations that we could not follow patients after one year to observe the long term effects. The small sample size is another drawback in our study.

CONCLUSION

Although uterine artery embolization, endometrial ablation or progestin-releasing intrauterine devices are increasingly used for treating common indications for hysterectomy such as fibroids and dysfunctional uterine bleeding, hysterectomy rates remain high[20] The medical consequences associated with ovarian failure are myriad and include higher risk for overall mortality, cardiovascular disease, diabetes, osteoarthritis, certain forms of cancer and depression. Our data suggests that women undergoing hysterectomy may be at a particular risk for these outcomes. It is always advisable to modify the indications of hysterectomy and there is need for improvisation in technique of hysterectomy so as to preserve blood supply to ovaries during hysterectomy. Women who have undergone hysterectomy at earlier age, premenopausal period need intense monitoring of bone density or cardiovascular risk factors.

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