

The Comparison of Ovarian Function After Hysterectomy with and Without Salpingectomy

Dr. Palla Prapooja Reddy¹, Dr. Yagnaswetha Unnam², Dr. Geetha K³

¹Postgraduate, ²Postgraduate, ³Professor & HOD

Department of Obstetrics and Gynaecology, Vinayaka Missions Medical College, Karaikal, Puducherry, India

Vinayaka Missions Research Foundation, deemed to be university

Corresponding Author: **Dr. Palla Prapooja Reddy**

Abstract:

Background: Ovaries are removed in variety of pathological conditions either alone or during hysterectomy or salpingectomy. So the present study was done to assess the ovarian functions in patients after hysterectomy with or without salpingectomy by using markers like sex hormones like estradiol, FSH, AMH. **Aim:** The comparison of ovarian function after hysterectomy with and without salpingectomy. **Methodology:** A Cohort study was done on 60 patients who admitted to gynecology ward, Vinayaka mission's medical college, karaikal for a duration of 18 months. Females of age 30-50 years, whose USG does not show any ovarian pathologies and hysterectomy indicated for uterine pathologies with normal ovaries were included in the study. Females with ovarian dysfunction, incidental ovarian pathology findings intra-operatively H/E revealed malignancy were excluded from the study. Investigations namely S.AMH, FSH, Estradiol on day 3 of menstrual cycle Patients who undergoes hysterectomy with salpingectomy are divided in one group and without salpingectomy in other group. Investigations namely S.AMH FSH, Estradiol done at end of 1st and 3rd month postoperatively for both groups. **Conclusion:** Ovarian function is not affected by bilateral prophylactic salpingectomy in reproductive age women who underwent hysterectomy in our study. However further studies are needed to observe whether salpingectomy is effective and risk preventing choice of ovarian cancer in future

Keywords: Hysterectomy, Salpingectomy, Ovarian function, Sex hormones

Introduction:

Ovaries are removed in variety of pathological conditions either alone or during hysterectomy or salpingectomy. Ovarian cancer which is multi factorial in origin is fifth most serious cancer effecting women. It has poor prognosis when diagnosed in later stages. Disease progression is also rapid [1]. Various studies showed that high grade serous type ovarian cancer originates from distal fallopian tube [2-4]. In such conditions prophylactic salpingectomy during hysterectomy has to be done to lower the risk of high grade serous ovarian cancer [5,6]. As per few researchers' salpingectomy during the time of laparoscopic hysterectomy can be the ideal procedure for preservation of ovaries [7-9]. Hence prophylactic salpingectomy may prevent ovarian cancer without the risk of premature menopause. Some other studies reveal that bilateral salpingectomy alone or in combination with hysterectomy may hasten the menopausal symptoms like hot flushes, vaginal dryness, depression, anxiety, heart diseases, decreased sex drive, osteoporosis sometimes premature death effecting the quality of female life. The antral follicle count also lowers after surgery. The ovarian blood supply can be damaged during hysterectomy and prophylactic salpingectomy. The ovaries receive blood supply from infundibulopelvic vessels, ovarian branch of uterine artery and a communicating branch formed by these two vessels. During laparoscopic hysterectomy there are chances for injury to ovarian branch of uterine artery and there is no clear-cut idea how the infundibulopelvic blood vessels are able to maintain blood supply to uterus adequate for maintaining ovarian reserve, as a result the antral follicles are also reduced after surgery. So, the present study was done to assess the ovarian functions in patients after hysterectomy with or without salpingectomy by using markers like sex hormones like estradiol, FSH, AMH.

Aim: The comparison of ovarian function after hysterectomy with and without salpingectomy

Objective:**Primary objective:**

To evaluate ovarian function with changes in serum levels of anti-mullerian hormone (AMH), follicle stimulating hormone (FSH) and estradiol (E₂) after hysterectomy with or without salpingectomy.

Secondary objective:

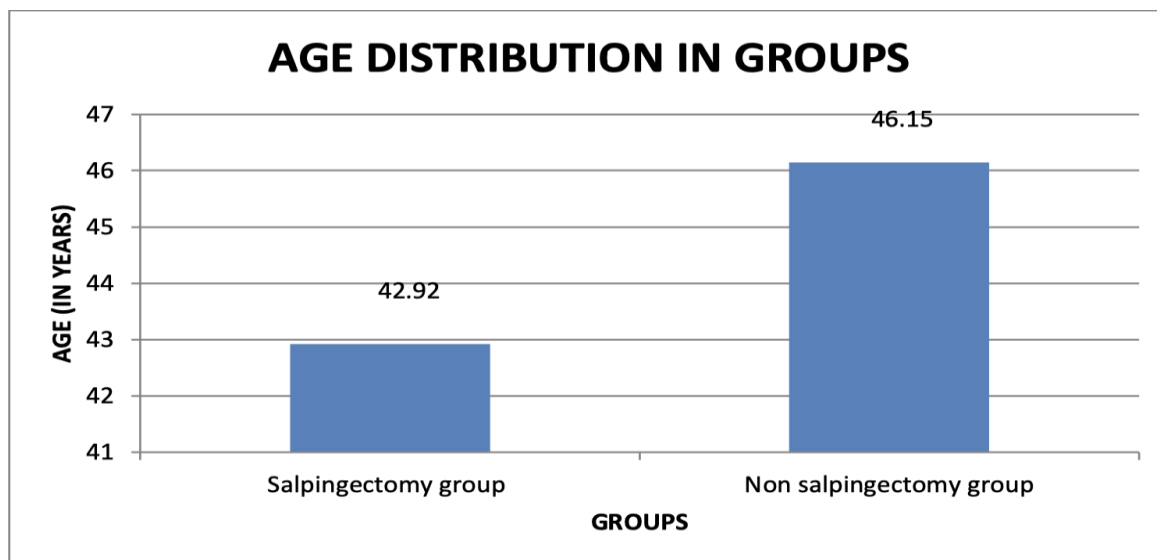
Effect of salpingectomy in ovarian cancer prophylaxis

Materials and methods:

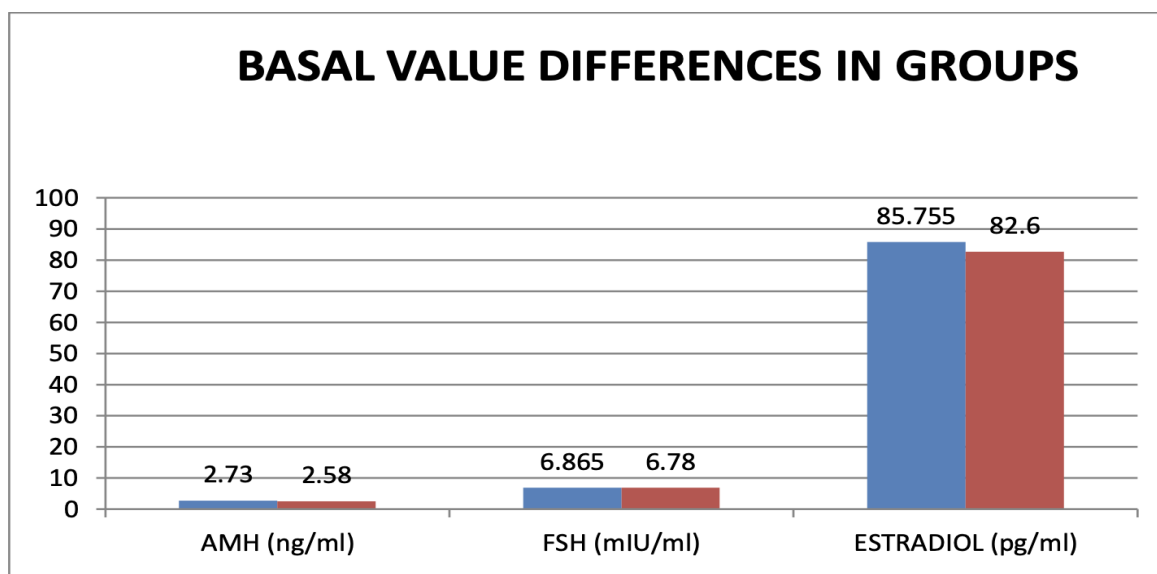
A Cohort study was done on 60 patients who admitted to gynecology ward, Vinayaka mission's medical college, Karaikal for a duration of 18 months. Females of age 30-50 years, whose USG does not show any ovarian pathologies and hysterectomy indicated for uterine pathologies with normal ovaries were included in the study. Females with ovarian dysfunction, incidental ovarian pathology findings intra-operatively H/E revealed malignancy were excluded from the

study. After applying inclusion and exclusion criteria. Investigations namely S.AMH, FSH, Estradiol on day 3 of menstrual cycle. Patients who undergo hysterectomy with salpingectomy are divided in one group and without salpingectomy in another group. Investigations namely S.AMH, FSH, Estradiol done at end of 1st and 3rd month postoperatively for both groups.

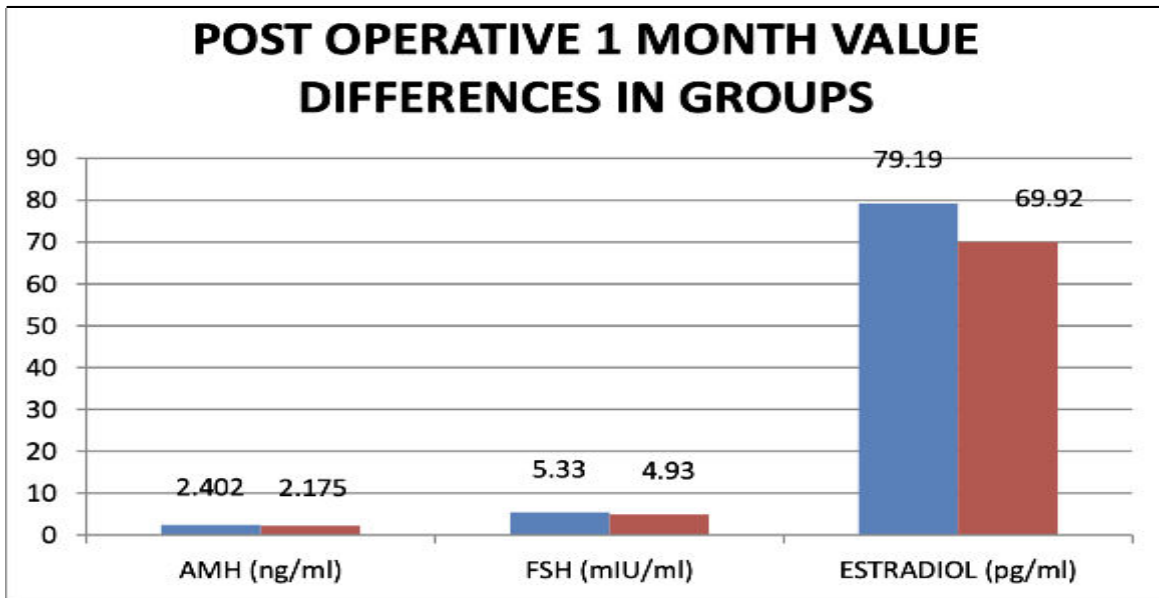
Results:



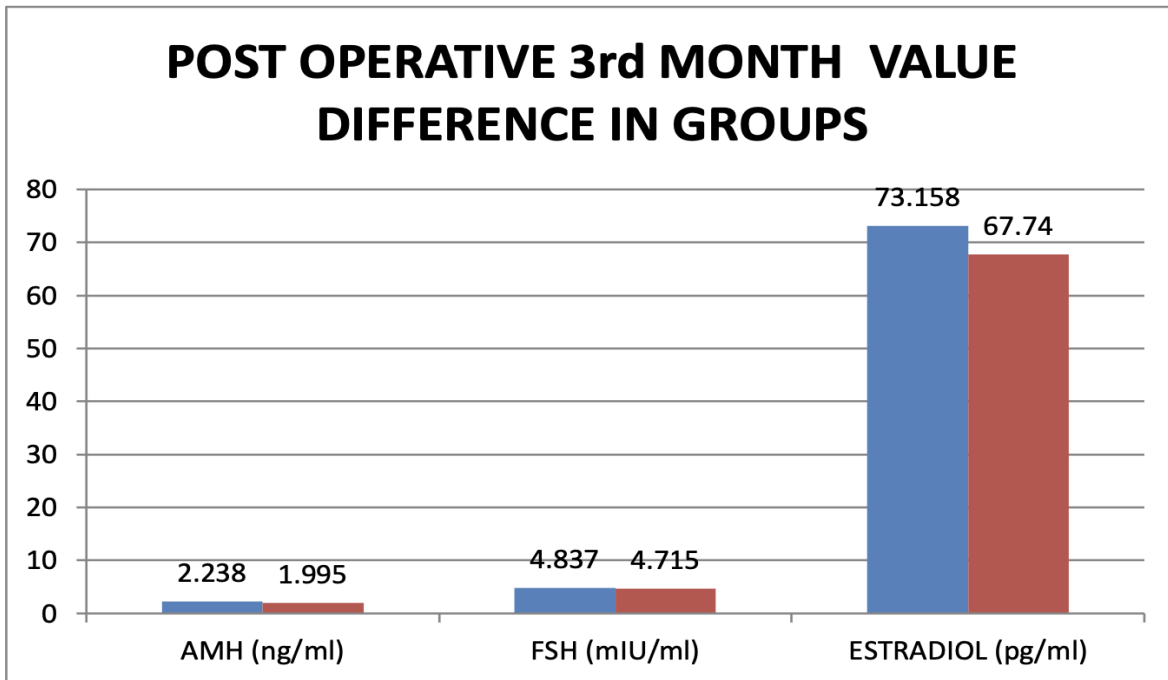
Graph1-Age distribution in groups



Graph 2-Basal value differences in between the groups



Graph 3: Post operative 1 month value differences in groups



GRAPH 4: POST OPERATIVE 3RD MONTH VALUE DIFFERENCES IN GROUPS

Difference between post-operative 1 month and Basal values of	Salpingectomy Group		Non salpingectomy Group		p-Value
	Mean difference	Standard error Mean	Mean difference	Standard error Mean	
AMH (ng/ml)	-0.3275	0.031	-0.4055	0.0625	0.267
FSH(mIU/ml)	-1.5350	0.1956	-1.85	0.2415	0.314
ESTRADIOL (pg/ml)	-6.5650	2.4373	-12.68	0.9137	0.061

Table1: Difference between post-operative 1 month and basal values

Table 2: Difference between post-operative 3 months values and postoperative 1 month

Difference between post-operative 3 months values and postoperative 1 month of	Salpingectomy Group		Non salpingectomy Group		p-Value
	Mean difference	Standard error Mean	Mean difference	Standard error Mean	
AMH (ng/ml)	-0.1650	0.0493	-0.1795	0.0404	0.821
FSH(mIU/ml)	-0.4925	0.1222	-0.2150	0.665	0.06
ESTRADIOL (pg/ml)	-6.0325	1.5874	-2.1800	0.3606	0.055

Table3: Difference between post-operative 3RD month and basal values

Difference between post-operative 3 months values and basal value	Salpingectomy Group		Non salpingectomy Group		p-Value
	Mean difference	Standard error Mean	Mean difference	Standard error Mean	
AMH (ng/ml)	-0.492	0.1222	-0.5850	0.0679	0.06
FSH(mIU/ml)	-2.028	0.7432	-0.2065	0.642	0.061
ESTRADIOL (pg/ml)	-12.597	0.974	-14.860	1.1243	0.065

Discussion:

In our study the mean age of patients in salpingectomy group is found to be 42.92 years and the mean age of patients with hysterectomy without salpingectomy is 46.15 years. The p-Value for age comparison in between 2 groups is <0.01 which is statistically significant. The mean preoperative /basal values of AMH in study group is observed to be 2.730 ng/ml and the mean AMH values in non-salpingectomy group was 2.580ng/dl. The p-Values for basal AMH levels $0.361[>0.05]$ which is statistically insignificant.

The mean pre-operative /basal values of FSH in salpingectomy group was found to be 6.865 mIU/ml and non-salpingectomy group was found to be 6.780mIU/ml. The p-Value is $0.766[>0.05]$, is statistically insignificant. The mean preoperative/basal values of estradiol in salpingectomy group were observed to be 85.755 in salpingectomy group and 82.600 in non-salpingectomy group p-Value is $0.633[>0.05]$ which is statistically insignificant. The mean post-operative AMH levels at the end of 1month in salpingectomy group was observed to be 2.402ng/dl and non-salpingectomy group was observed to be 2.175 ng/ml. p -value is $0.147[>0.05]$ statistically insignificant. The mean post-operative FSH levels at the end of 1month in salpingectomy group was observed to be 5.330mIU/ml in salpingectomy group and it was 4.930mIU/ml in non-salpingectomy group with p-Value of $0.222[>0.05]$ statistically insignificant. The mean post-operative estradiol levels at the end of 1 month is observed to be 73.158 pg/ml in salpingectomy group and 67.740 pg/ml in non-salpingectomy group.p-Value for this is $0.416[>0.05]$ statistically insignificant. On comparison of mean AMH values post-operative 3-month values,it was observed that the mean AMH value in salpingectomy group was observed to be 2.238ng/ml,and in non-salpingectomy group it was observed to be 1.995 ng/ml.p-Value for mean AMH values in 3-month post-operative period was $0.267[>0.05]$ statistically insignificant. The mean FSH values in post-operative 3-month period was observed to be 4.837mIU/ml in salpingectomy group and in non-salpingectomy group it was 4.715mIU/ ml with the p-value of $0.700[>0.05]$ which is statistically insignificant.

The mean estradiol levels in postoperative 3-month period were observed to be 73.158 pg/ml in salpingectomy group and was 67.740pg/ml in non-salpingectomy Group P-Value was observed to be $0.416[>0.05]$ which is statistically insignificant. On comparison of mean difference of AMH levels between preoperative/basal values, i.e. -0.4055 and post-operative 1-month period mean difference -0.3275, p-value is $0.267[>0.05]$ which is statistically insignificant. On comparison of mean difference of FSH levels between basal values i. e, -1.5330 with FSH levels post-operative 1-month period i.e. -1.85, p-Value is $0.314[>0.05]$ statistically insignificant.

On comparison of mean difference of estradiol levels between basal values i.e. -6.5650 with post-operative period 1 month -12.68, p-Value is 0.021 [<0.05] is statistically significant. The mean difference of AMH values between postoperative period of 1 month and post-operative period of 3 months in salpingectomy group is -0.1650 ng/ml, and in non-salpingectomy group it is -0.2150, p-Value is 0.821, it is just statistically insignificant. The mean difference of FSH values between postoperative period of 1 month and post-operative period of 3 months in salpingectomy group is -0.4925mIU/ml, and in non-salpingectomy group it is -0.2150mIU/ml, p-Value is 0.05, it is just statistically significant. The mean difference of estradiol values between postoperative period of 1 month and post-operative period of 3 months in salpingectomy group is -6.0325pg/ml, and in non-salpingectomy group it is -2.1800p/ml, p-Value is 0.02 [<0.05], it is statistically significant.

In a study by Mekin Sezik et al., on the short- and medium-term consequences of total salpingectomy during abdominal hysterectomy (without oophorectomy) on certain ovarian reserve parameters and blood flow velocity measurements through the ovarian stroma revealed that it might be important to preserve blood supply of ovaries during performing hysterectomy in the reproductive period.

In a study by Austin D. Findley et al., on the short-term effects of salpingectomy during laparoscopic hysterectomy on ovarian reserve when ovarian preservation is planned in order to determine the feasibility of conducting this study on a large scale. Salpingectomy at the time of hysterectomy with ovarian preservation is a safe procedure that does not appear to have any short-term deleterious effects on ovarian reserve, as measured by AMH level.

Conducting a trial of this nature that is adequately powered with long-term follow-up would be feasible and is required to definitively confirm these results. In our study the mean preoperative /basal values of AMH in study group is observed to be 2.730 ng/ml and the mean AMH values in non-salpingectomy group was 2.580 ng/dl. The p-Values for basal AMH levels are 0.361 [>0.05] which is statistically insignificant. The mean post-operative AMH levels at the end of 1 month in salpingectomy group was observed to be 2.402ng/dl and non-salpingectomy group was observed to be 2.175 ng/ml. p - value is 0.147 [>0.05] statistically insignificant. On comparison of mean AMH values post-operative 3-month values, it was observed that the mean AMH value in salpingectomy group was observed to be 2.238 ng/ml, and in non-salpingectomy group it was observed to be 1.995 ng/ml. p-Value for mean AMH values in 3-month post-operative period was 0.267 [>0.05] statistically insignificant.

My study is in agree with the study done by Austin D. Findley et al., In our study there is no significant change in mean MSH levels in preoperative period and post-operative 1 month and post-operative 3 months in between salpingectomy group and non-salpingectomy group where p value >0.05 .

This is in correlation with the study done by Farbia Behnamfar et al; who conducted a clinical trial on patients who underwent hysterectomy with or without bilateral salpingectomy observed that bilateral salpingectomy during hysterectomy does not increase ovarian dysfunction even after 6 months of follow up.

Conclusion:

Ovarian function is not affected by bilateral prophylactic salpingectomy in reproductive age women who underwent hysterectomy in our study. However further studies are needed to observe whether salpingectomy is effective and risk preventing choice of ovarian cancer in future. However long term follows up are needed for further evaluation of risks and benefits.

References:

- 1) Stuparich MA, Lee TTM. Tips and Tricks for Performing Salpingectomy at the Time of Laparoscopic Hysterectomy. *J Minim Invasive Gynecol.* 2017;24(2): 205.
- 2) Scheib SA. A Laparoendoscopic Single-site Surgical Approach to Laparoscopic Salpingectomy. *J Minim Invasive Gynecol.* 2018;25(2):326–7.
- 3) Collins E, Strandell A, Granåsen G, Idahl A. Menopausal symptoms and surgical complications after opportunistic bilateral salpingectomy, a register- based cohort study. *Am J Obstet Gynecol.* 2019;220(1):85 Lheureux S, Gourley C, Vergote I, Oza AM. Epithelial ovarian cancer. *Lancet.* 2019;393:124–53.
- 4) Labidi-Galy SI, Papp E, Hallberg D, Niknafs N, Adleff V, Noe M, et al. High grade serous ovarian carcinomas originate in the fallopian tube. *Nat Commun.* 2017;8:1093.
- 5) Kurman RJ. Origin and molecular pathogenesis of ovarian high-grade serous carcinoma. *Ann Oncol.* 2013;24(Suppl 10):x16–21.
- 6) Atalay MA, Cetinkaya Demir B, Ozerkan K. Change in the ovarian environment after hysterectomy with bilateral salpingectomy: Is it the technique or surgery itself ?*Eur J ObstetGynecolReprod Biol.* 2016;204:57– 61.
- 7) Chao X, Wang X, Xiao Y, Ji M, Wang S, Shi H, Fan Q, Zhu L, Leng J, Sun D, Lang J. Effects of hysterectomy with simultaneous bilateral salpingectomy on the subsequent pelvic mass. *J Ovarian Res.* 2019;12(1):27.
- 8) Gaba F, Piek J, Menon U, Manchanda R. Risk-reducing early salpingectomy and delayed oophorectomy as a two-staged alternative for primary prevention of ovarian cancer in women at increased risk: a commentary. *BJOG.* 2019;126(7):831–9.
- 9) Roberta Venturella M, Morelli D, Lico AD, Cello M, Rocca A, Sacchinelli R, Mocciaro PD'Alessandro, Maiorana A, Gizzo S, Fulvio Zullo. Wide excision of soft tissues adjacent to the ovary and fallopian tube does not impair the ovarian reserve in women undergoing prophylactic bilateral salpingectomy: results from a randomized, controlled trial. *Fertil Steril.* 2015;104(5):1332–9.e1-85.e10.

- 10) Chen T, Zhao F, Wang Q, Liu C, Lan Y, Wang S, Xin Z, Yang X. Salpingectomy may decrease antral follicle count but not live birth rate for IVF-ET patients aged 35–39 years: a retrospective study. *J Ovarian Res.* 2020; 13(1):80.
- 11) Dietl J, Wischhusen J. The postreproductive salpingectomy. *Fertil Steril.* 2014;101:e20.
- 12) Tal R, Seifer DB. Ovarian reserve testing: a user's guide. *Front Endocrinol (Lausanne).* 2019;10:281.
- 13) Landersoe SK, Forman JL, Birch Petersen K, Larsen EC, Nøhr B, Hvidman HW, Nielsen HS, Nyboe Andersen A. Ovarian reserve markers in women using various hormonal contraceptives. *Eur J Contracept Reprod Health Care.* 2020;25(1):65–71.
- 14) Ge W, Li L, Dyce PW, De Felici M, Shen W. Establishment and depletion of the ovarian reserve: physiology and impact of environmental chemicals. *Cell Mol Life Sci.* 2019;76(9):1729–46.