

# Comparison between Injection of Diluted Vasopressin and Saline Only in Laparoscopic Excision of Ovarian Endometrioma

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Article

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## ABSTRACT

**Introduction:** The formation of tissue that resembles endometrium outside of the uterus is a hallmark of the chronic inflammatory disease known as endometriosis. Ovarian endometriosis typically affects women. 19%–28% of endometriosis patients have bilateral ovarian endometriomas. Laparoscopic cyst excision for endometriotic ovarian cysts improves fertility and reduces recurrence. The vasopressin injection approach was developed to reduce endometrioma recurrence and preserve ovarian reserve after laparoscopic cystectomy. Some texts and research recommend vasopressin for laparoscopic ovarian cystectomy.

**Material and Methods:** This was a study done in Benha University hospital and Aminah Endoscopy Center from January 2021 to February 2022. The study was conducted on 75 subjects. The study's subjects were women who were scheduled for laparoscopic surgery and had ovarian endometriomas. 25 patients are the group of non-injected laparoscopic cystectomy made up Group 1 (control group). 25 patients from Group 2 (the saline group) had saline injections and a laparoscopic cystectomy. Group 3 vasopressin injection group (VI group) included 25 patients who had laparoscopic cystectomy with diluted vasopressin injection.

**Results:** In the VI and saline groups, there were statistically significant differences from the control group in the incidence of ovarian tissue involvement in endometrioma wall specimens, the thickness of tissue specimens, and the thickness of ovarian tissue accidentally removed. However, these alterations did not differ statistically significantly between the VIT and saline groups.

**Conclusion:** Vasopressin injection method decreases the harm that conventional laparoscopic cystectomy causes to ovarian reserve.

**Key Words:** Endometrioma, ovarian, vasopressin.

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## INTRODUCTION

Endometrium-like tissue outside of the uterus is a defining feature of the chronic inflammatory condition endometriosis. The formation and development of such endometriotic tissue is Since various surgical procedures entail the danger of ovarian reserve deterioration or recurrent surgery owing to recurrence, some fertility specialists would rather begin *in vitro* fertilisation (IVF) therapy without surgery first<sup>[1]</sup>. However, the presence of endometrioma may potentially impair ovarian responsiveness during ovarian stimulation and provide challenges and dangers during oocyte extraction. Injury to the neighbouring organs owing to changed pelvic architecture induced by adhesions, unintentional puncturing of the endometrioma during oocyte extraction resulting in infection and abscess development, and endometrioma-containing follicular fluid contamination are two possible side effects<sup>[2]</sup>.

The ovary is the organ that endometriosis typically affects. Ovarian endometriomas are seen in 17–44% of

endometriosis patients, and 19–28% of them are bilateral. It is believed that removing endometriotic ovarian cysts laparoscopically will reduce recurrence and increase fertility. Standard laparoscopic cystectomy is quick, safe, and well-recognized, with a low incidence of lesions recurring after the cyst is removed using stripping and bipolar coagulation<sup>[3]</sup>. a number of prior studies have linked this technique to a diminished ovarian reserve after surgery<sup>[4]</sup>.

After laparoscopic endometrioma cystectomy, the vasopressin injection method was created to reduce recurrence and preserve ovarian reserve. In a few books and studies, the use of vasopressin during laparoscopic ovarian cystectomy has been discussed<sup>[5]</sup>.

The present study is aimed to compare between diluted vasopressin and saline only in laparoscopic excision of ovarian endometrioma.

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## MATERIAL AND METHODS

This was a study done in Benha University hospital and Aminah Endoscopy Center from January 2021 to February 2022. The study was conducted on 75 subjects. All were followed at the obstetrics and gynecology units at the Faculties of Medicine of Benha and Aminah Endoscopy Center in Benha.

Women scheduled for laparoscopic surgery who had ovarian endometriomas participated in the experiment.

Inclusion criteria were having single-lobular endometriotic cyst as affirmed through ultrasound appraisal; age 30 to 38 years; standard feminine stream, characterized as cycle term of 28 to 30 days in the a half year before medical procedure; no intention to become pregnant for one to two years following the activity, no recent endometriosis treatment under attentive observation, and no recent endometriosis treatment under clinical supervision; no endocrine disease is recognised. After the last analysis of qualification was finished and identification of antral cyst count (AFC) variety and against müllerian chemical (AMH), girls with sex gland endometriomas were at random distributed haphazardly to three gatherings in 1:1:1 proportion, as follows. to begin with, the irregular variety of each patient was half-track down in a very table of arbitrary varieties as per confirmation number. The gathering variety was the rest of the irregular variety, split by three. Teams of patients were assigned, and the remaining varieties (1, 2 or 3) correspond to groups 1, 2, or 3, accordingly.

**Group 1 (control group):** 25 patients treated with routine laparoscopic cystectomy without injection.

**Group 2 (saline group):** 25 patients treated with laparoscopic cystectomy with injection of saline solution.

**Group 3 (VI group):** 25 patients treated with laparoscopic cystectomy with diluted vasopressin injection.

The ovarian cyst is removed from the ovary using a laparoscopic cystectomy. In the VIT group, diluted vasopressin was injected into the region between the cyst wall and the healthy ovarian cortex. This caused a physical separation between the two. In order to inject 20 to 30 mL of diluted vasopressin (vasopressin concentration 0.06 U/mL) into the gap between the cyst wall and the healthy ovarian cortex, one puncture was made into each ovary. After puncturing the ovary above the cyst, there was typically no or very little blood. Between 2.4 and 3.6 U of vasopressin were intramuscularly administered for each cyst. In the saline group, 20 to 30 mL of saline solution was substituted for diluted vasopressin in the region between the cyst wall and the healthy ovarian cortex.

A 2-cm sample of each ovarian cyst was collected after the surgical excision of the bilateral ovarian endometriomas. This sample was utilised to examine the frequency of ovarian tissue in cyst wall specimens and the typical thickness of ovarian tissue removed using histologic analysis. The average thickness of the cyst wall and the ovarian tissue excised were both measured in millimetres for each patient (where present). An enzyme-linked immunosorbent assay (ELISA) kit was used to determine the plasma FSH levels on cycle day 3 before surgery as well as on days 3, 6, and 12 thereafter. After two consecutive regular menstrual cycles, ultrasound examination and serum AMH testing were performed for all patients before their discharge the following day.

### *Ethical Approval*

Each participant in the study provided written informed consent, which was acquired after the ethics committee at the institution gave the project the go-ahead. When conducting this human study, The Declaration of Helsinki, the code of ethics of the World Medical Association, was followed.

### *Statistical Analysis*

Data that was generated by computers was analysed using IBM SPSS version 22.0. Quantitative data was expressed using percentages and numbers. For both parametric and nonparametric analyses, it was necessary to run Kolmogorov-Smirnov tests to make sure the data were normal before using the median or interquartile range. To determine the significance of the results, we applied the (0.05) significance criterion. To compare two or more groups, use the Chi-Square test. Any cell counts less than 5 can be compensated for using the Monte Carlo test. Tables displaying non-continuous data have Fischer Chi-Square adjustments made.

## RESULTS

There was no significant difference between included subjects regarding basal characteristics (Table 1).

The frequency of ovarian tissue and the thickness of the tissue specimens in endometrioma walls, and the thickness of ovarian tissue accidentally removed were statistically different in the VIT and compared to the control group, saline groups. There was no statistically significant difference between the VIT and saline groups in these variables (Table 2).

Hb level, AFC, and AMH did not significantly differ across research groups. However, saline group and VI group considerably lower FSH levels and coagulation events compared to controls, and VI group was much lower than saline group (Table 3).

**Table 1:** Patients basal characteristics of included subjects

	Control Group (N = 25)	Saline Group (N = 25)	VIT Group (N = 25)	<i>P. Value</i>
Age (Years)	34.61 ± 4.25	33.31 ± 4.34	35.5 ± 4.46	0.287843
Diameter of endometrioma (mm)	5.28 ± 0.6	5.23 ± 0.52	5.18 ± 0.57	0.685237
BMI	25.5 ± 4.03	25.68 ± 4.34	25.22 ± 5.28	0.818247
Hb Level (g/dl)	10.73 ± 1.9	10.58 ± 1.81	10.59 ± 1.32	0.841563
FSH (mIU/mL)	5.57 ± 0.57	5.56 ± 0.62	5.5 ± 0.72	0.804847
AFC	7.46 ± 1.5	7.06 ± 1.81	7.36 ± 1.29	0.570713
AMH (ng/ml)	2.21 ± 0.87	2.18 ± 0.91	2.26 ± 0.96	0.839903

AFC: Antral Follicle Count number| AMH: Anti-Müllerian Hormone T. test

**Table 2:** Ovarian tissue lost during operation in the 3 groups

	Control Group (N = 25)	Saline Group (N = 25)	VIT Group (N = 25)	<i>P. Value</i>
Endometrioma cyst wall (mm)	1.67 ± 0.17	1.1 ± 0.32*	0.99 ± 0.23*	0.058533
Ovarian tissue (mm)	0.61 ± 0.08	0.33 ± 0.03*	0.3 ± 0.05*	0.00557
Presence of ovarian tissue	18 (72%)	8 (32%)*	6 (24%)*	0.0012

\*Significantly different vs control group

**Table 3:** Post operative outcomes

	Control Group (N = 25)	Saline Group (N = 25)	VIT Group (N = 25)	<i>P. Value</i>
Hb Level (g/dl)	9.57 ± 9.61	9.65 ± 1.71	9.55 ± 1.59	0.930597
FSH (mIU/mL)	12.53 ± 9.68	6.34 ± 6.29*	6.33 ± 1.2*	0.33698
AFC	6.07 ± 6.15	6.66 ± 1.11	6.67 ± 1.43	0.75278
AMH (ng/ml)	1.76 ± 1.85	1.53 ± 0.66	1.53 ± 0.58	0.70744
Coagulation events	15.29 ± 10.4	7.35 ± 2.59*	7.36 ± 2.09*	0.33009

\*Significantly different vs control group

## DISCUSSION

There is presently no reliable way to lessen the damage that bilateral endometriomas laparoscopic cystectomy causes to the ovarian reserve. According to the current study, ovarian tissue loss and the need for electrocoagulation during laparoscopic cystectomy in women with bilateral endometriomas can be minimised, vasopressin solution injection may protect postoperative ovarian reserve. The ovarian reserve of women who underwent bilateral laparoscopic cystectomies for endometriomas has reportedly declined more rapidly in recent years<sup>[6]</sup>. Age, the size of the endometrioma, the pre-treatment baseline FSH level The actual cystectomy operation and the amount of surgical skill required to treat ovarian endometriosis are two potential sources of ovarian damage<sup>[7;8]</sup>.

In the current experiment, a single skilled surgeon performed all surgical procedures, and the initial characteristics of the three groups were identical. This study looked into the connection between postoperative ovarian reserve depletion and laparoscopic surgery. Bipolar coagulation was used to treat ovarian tissue after laparoscopic surgery to remove healthy ovarian tissue. Following surgery, the FSH level in the control group significantly increased, exposing the severe ovarian reserve depletion brought on by the conventional laparoscopic

cystectomy approach.

After surgery, the basal FSH levels in the VI and saline groups were significantly lower than those in the control group ( $P > 0.05$ ), and the FSH level in the saline group was significantly higher than that of the VI group ( $P < 0.05$ ). This finding suggests that the vasopressin injection procedure was more successful in preventing ovarian reserve damage. The main causes of the deterioration in ovarian reserve are thought to be the loss of healthy ovarian tissue and the destruction of ovarian tissue brought on using bipolar coagulation<sup>[9]</sup>. Several authors have suggested suturing just the ovary to prevent electrocoagulation damage<sup>[10,11]</sup>. The suture, however, may cause ischemic damage to the ovary and encourage ovarian adhesion to the surrounding tissues if its placement is incorrect and excessively tight<sup>[12]</sup>.

The vasopressin injection method used in the current study reduced both leaking from the ovarian cortex as a result of vasoconstriction and hydro dissection as well as vascular rupture of the ovarian parenchyma. The lower frequency of coagulation events in the VI and saline groups in comparison to the control group shows that fluid injection during cystectomy decreases coagulation-related injury to normal ovarian tissue ( $P < 0.05$ ). Importantly, fewer coagulation events occurred in the VI group compared to the saline group ( $P < 0.05$ ), demonstrating that

VI injection reduces coagulation-related ovarian tissue injury more effectively than saline injection.

Too-tight suturing may induce ischemia alterations in normal ovarian tissue. Nevertheless, excessive coagulation might result in thermal injury and vascular system malfunction. Important factors include stripping at an adequate layer and preventing haemorrhage. To find the optimal strategy for laparoscopic ovarian cystectomy, more research and analysis will be necessary. No of the strategy, care must be taken in each instance to use mild and protective surgical procedures.

## CONCLUSION

vasopressin injection method decreases the harm that conventional laparoscopic cystectomy causes to ovarian reserve.

## CONFLICT OF INTERESTS

There are no conflicts of interest.

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