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## Pregnancy rate after trans-vaginal aspiration of ovarian endometrioma in infertile patients

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### **Abstract**

**Objectives:** study the effect of simple trans-vaginal aspiration of chocolate cyst on pregnancy rate among the infertile patients diagnosed with ovarian endometrioma less than 6 cm.

**Study design:** controlled clinical trial.

**Subjects and methods:** 100 cases recruited for the trial and divided into two groups

Group one: the intervention group 50 cases diagnosed with ovarian endometrioma undergone chocolate cyst aspiration in zinat alhayat hospital after consultation and written consent.

Group two: 50 controls comprises the nonintervention group and cyst left without aspiration

All cases and controls done AMH, antral follicle count, stromal flow resistive index and CA 125 at the first month, Cases and controls followed in a period of 3 month the first month passed without induction

Second and third months ovulation was induced in both groups with HMG meriofert 75 unit at day 3,5and 7 then follicular growth monitored and ovulation triggered by HCG, pregnancy diagnosed with quantitative HCG and followed to the clinical pregnancy rate with viable fetal pulsations at 6 weeks.

**Outcome measures:** CA 125 antral follicle count stromal flow resistive index, deep dyspareunia and clinical pregnancy rate.

**Results:** regarding antral follicle count a good count of 12 found in the intervention group in 35 out of 50 compared to 20 out of 50 in the control group with p value 0.002, regarding significant stromal flow resistive index of 0.5 there were 40 out of 50 in cases and 25 out of 50 in controls with p value of 0.001,a statically significant difference with p value of 0.001 was found retrograding deep dyspareunia ,and clinical pregnancy observed in 30 cases out of 50 compared to 15 out of 50 in controls with p value of 0.002.

**Conclusion:** simple trans-vaginal aspiration of ovarian chocolate cyst can improve ovarian response and increase clinical pregnancy rate better than conservative management

**Keywords:** infertility, chocolate cyst, simple trans-vaginal aspiration, pregnancy rate.

## **Introduction**

Endometriosis affects 20% to 40% of women consulting for fertility disorders. (1)

Endometriosis can affect about 30 percent of infertile females and can be subtle which skipped diagnosis by the classical tools ,cases of endometriosis in infertile patients affect ovary commonly ,it can be a surface lesion in the form of powder burn or ectopic endometrial cells can implant themselves in the ovarian cortex creating a chocolate cyst .(2,3)

Chocolate cyst is a common condition in infertile females and ovary is a primary site for endometriotic implantation due to trans-tubal regurgitation of menstrual blood containing ectopic endometrium into the substance of the ovary.

Ovarian endometrioses can affect ovulation by impairing ovulation and by affection of the oocyte quality alongside the accompanying pressure; also these effects with pressure and intense inflammation induce a variable degrees of pain.(4)

Advances in the management of endometriosis include three- dimensional volumetric analysis and also a laparoscopic and robotic interventions but still endometriosis is a major problem due to advanced age at marriage and delaying fertility.(5,6)

Endometriosis surgery especially invasive can affect ovarian reserve and antral follicle count so efforts made to find alternatives for the invasive surgery one of them is trans-vaginal aspiration.

Intra-cytoplasmic sperm injection especially with the long protocol improves also pregnancy rate in patients with endometriosis but due to the

cost and the psychological burden many cases prefer delaying IVF for these reasons. (7, 8)

Conventional endometriosis laparoscopic surgery with cystectomy may decrease the ovarian reserve by the excision of the ovarian cortex. (10)

Many surgical interventions done to reduce pelvic pain in endometriosis and improve fertility rate specially the minimally invasive approach gained special concern, but laparoscopic cystectomy can affect the ovarian reserve and antral follicle count after surgery. (11)

Endometriomas can affect quality of life in effected women regarding the pelvic pain, infertility, and the ovarian reserve and consequently ovarian response, the inflammatory reaction induced by endometriosis with release of inflammatory cytokines can affect implantation and create peritoneal adhesions aiding in the infertility. (12)

## **Materials and methods**

**Study duration:** from December 2020 to December 2021

**Study setting:** zinat alhayat hospital Benha city

**Sample size:** 100 cases divided into two groups each group consisted of 50 cases

**Ethical approval:** written consent taken from all participants

### **Inclusion criteria**

Infertility for 2 years

Single unilateral or bilateral ovarian chocolate (endometrioma) cyst

Cyst size not exceeding 6cm

### **Exclusion criteria**

Male factor

Extra pelvic endometriosis

Multicystic cases

Cyst size more than 6 cm

Hydrosalpinx

Tubal block

The study included 100 patients with infertility and proved to have endometriotic chocolate cyst unilateral or bilateral but single ones not exceeding 6 cm diameter cases divided into two groups

Group one (the intervention) aspiration group

Group two the control group (nonintervention)

In the intervention group cases were scheduled to trans-vaginal cyst aspiration in Zinat al-Hayat hospital after preparing with essential laboratory investigations and ultrasound evaluation to confirm presence of the chocolate cyst and exclude cases of extra ovarian endometriosis or other pelvic organ affection by endometriosis.

### **History**

Duration of infertility

Male factor

Pelvic pain patient given a pain scale to rate pain from 1 to 10 including pelvic pain or provoked deep dyspareunia

Dyspareunia.

### **Complete examination**

General abdominal and local examination.

### **Complete ultrasound evaluation**

Midline structures like uterus and cervix.

Ovaries (both sides).

Sliding test.

Hydrosalpinx .

Torus uterinus.

Uterosacral ligaments.

### **Basal investigations (at the initial evaluation)**

CBC (complete blood count)

Blood glucose

TSH (thyroid stimulating hormone)

FSH (follicle stimulating hormone)

CA125 (cancer antigen 125)

VITAMIN D3

HB AB (hepatitis B antibody and antigen)

HC AB (hepatitis c antibody)

AMH (anti-mullerian hormone).

### **Intervention**

Cases scheduled for trans-vaginal aspiration had an overnight fast.

Intervention was performed under general anesthesia and trans-vaginal ultrasound control (mind ray dc 6). Prophylaxis with 1g Cefotaxime was given intra-operatively and all cases received betadine vaginal douches for 4 days then neutral douche received 2 days before the procedure.

Initial trans-vaginal scan done with rapid diagnostic thorough sweep to exclude contra-indication then full pelvic ultrasound evaluation to scan uterus cervix, Douglas pouch , uterosacral ligament and torus uterinus . Then full ovarian scan on both sides to localize endometrioma and assess the size .

Trans-vaginally aspiration done under ultrasound guidance; with a single lumen 17 Gx250 mm needle.

Contents sent for cytological examination to prove the pathological condition it is my routine to add penicillin gram mixed with 10 ml saline to be flushed into the cyst to lower infection rate.

Cases and controls followed monthly for three months and all cases and controls given induction of ovulation by HMG 75 u im on day 3,5 and 7 then ovulation monitored by folliculometry and the course was repeated at third month if no pregnancy obtained .

### **First month**

no induction leaving cases for spontaneous pregnancy.

## **Second and third month**

cases and controls given induction with HMG in the form of meriofert 75 units IM (IBSA) at day 3,5and 7a pregnancy test done if there was a missed day a urine pregnancy test done clinical pregnancy was defined as the visualization of a positive fetal heart with ultrasound at 6 weeks, pregnant cases were followed and given a perfect antenatal care.

## **Outcome measures**

Serum CA 125

Antral follicle count (counted for each ovary)

Clinical pregnancy rate (visible pulsations at 6 w)

Dyspareunia relief

Stromal flow resistive index less than 0.5

## **Results**

Following surgery investigations done at the first month without intervention

Regarding antral follicle count there were a statistically significant difference in the intervention group with antral follicle count of 12 per ovary in 35 out of 50 while in the control group p value =0.002 a high statistical difference and this was reflected upon the pregnancy rate.

Regarding resistive index below or equal to 0.5 there were 40 cases out of 50 in the intervention group compared to 25 out of 50 in the control group with p value 0.001 that highly signify a positive impact.

Regarding deep dyspareunia 10 out of 50 complained in the intervention group compared to 25 out of 50 in the control group with p value of 0.001 and a high statistically significant difference.

The most important was a clinical pregnancy rate which was 30 out of 50 in the intervention group compared to 15 out of 50 in the nonintervention control group with p value of 0.002 a high statically significant difference see table one .

**Table one (outcome measures)**

item	Group one	Group 2	P value	significance
Ovarian Stromal flow RI <0.5	40	25	0.0017	S
AMH basal	3.1	3.02	>0.05	NS
Day 3FSH	7	8	>0.05	NS
AFC 12 or more	35	20	0.0026	S
CA125 <35	38	22	0.001	S
Clinical pregnancy	30/50 (60%)	15/50 (30%)	0.002	S
Deep dyspaeunia	10/50 (20%)	25/50 (50%)	0.001	S

## **Discussion**

Endometriosis is a major problem of pelvic pain and infertility and prevalence in infertile females may reach about 30 percent, ovarian endometrioma is a special case due to its negative effect on ovarian reserve and oocyte quality

Attempts mad through many surgical interventions to increase fertility rate and im-

prove pelvic pain and quality of life and the most important surgical intervention is the laparoscopic cystectomy, cystectomy also may affect ovarian reserve and decrease the fertility potential

Our study was an alternative surgical dimple intervention through ovarian chocolate cyst aspiration trans-vaginally to evacuate cyst contents and decrease inflammatory reactions

Cases recruited from infertile patients attending elshrouk IVF hospital and diagnosed with subfertility and the sole cause is single ovarian endometriotic cyst not exceeding 6 cm

Cysts aspirated and sent for cytological examinations and all cases and controls followed 3 moth with ultrasound and pregnancy test if there was a missed period

The first month after intervention left free without induction and CA 125 stromal resistive index pelvic pain CA125 evaluated without induction

the second and third month following aspiration total cases and controls undergone ovarian induction with human menopausal gonadotropins 75 unit at the 3rd the 5th and the 7th days of menstruation ,folliculometry done , HCG was given when follicles reached 20 mm ,pregnancy tested with quantitative HCG and followed to the clinical pregnancy diagnosed by fetal pulsation atv6 w.

There was a high significant clinical pregnancy rate in the intervention group with 30 out of 50 cases compared to only 16 clinical pregnancies out of 50 with p value 0.002.

The presented work also found a high statistically significant difference regarding stromal flow resistive index belowv0.5 with good antral follicle count stromal flow resistance index was 0.5 in about 40 out ofv50 in the intervention group compared to 35 out of 50 in the control group with p value 0.001 and the deep dyspareunia found in 10 out of 50 in the intervention group compared to 25 out of 50 in the controls with p value of 0.001.

A retrospective study by Guo found that aspiration of chocolate cyst improved oocyte quality and ovarian response prior to in vitro fertilization. (12)

Lee et al found that both conservative management and ovarian aspiration with ethanol sclerotherapy had the same good results. (13)

Despite the various interventions of ovarian endometriosis still chocolate cyst remained a problem of pelvic pain and infertility

The good aspect in the presented work was the significant clinical pregnancy rate and the changes in antral follicle count and stromal flow index which were positively changed and reflected upon the main outcome which was the clinical pregnancy rate

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