

Role of endometrial scratching in women with infertility due to unknown cause in increasing pregnancy rate

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Abstract

Endometrial injury is a simple invasive with low-cost procedure that may improve biochemical and molecular changes that increase pregnancy rate. One hundred patients suffered from unexplained infertility were collected blindly as outpatients from private clinic in

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Tripoli, Misurata and Surman. We divided them into two groups (50 women each). Endometrial scratching was done in preovulatory period after controlled ovarian stimulation by clomide citrate for one group then followed up for six months and compared with the control group to evaluate pregnancy rate. The study revealed that endometrial scratching increased pregnancy rate significantly without affection on abortion rate. The study concluded that endometrial scratching could be used in unexplained infertility before any complex interference.

Key words: *Endometrium, scratching, pregnancy rate ,infertility.*

1. Introduction

Unexplained infertility is a term that has been applied in as many as 30 \40 % of infertile couples (Simure et al.,2009)¹. The potential causes of unexplained infertility have been described as disturbances in endocrinology balance, immunology, genetic, and reproductive physiology (Pellicor et al., 1998) ².Most women had a type of subfertility known as unexplained subfertility, which means that after having all routine tests done there is no obvious explanation for why the couple has not become pregnant so far .According to the American society of reproductive medicine (ASRM,1992)³, standard infertility evaluation include: semen analysis, post coital test ,assessment of ovulation and a hystersalpinogram and if indicated laparoscopy. However, the basic evaluation should provide evidence of ovulation , adequate sperm production and patency of fallopian tubes(ASRM,2006)⁴. The diagnosis of unexplained infertility is made when tubal patency, normal ovulatory function ,basal body temperature, cervical mucus normal semen analyses are established. Endometrial injury is a simple minimally invasive with low-cost procedure that may improve biochemical and molecular changes that increase pregnancy rate. The endometrium is a layer of tissue that lines the inside of the womb. In the first step of a pregnancy, an embryo will attach to the endometrium in a process called implantation.

Endometrial scratching, also known as endometrial injury, is a procedure undertaken to purposely disrupt the endometrium in women wanting to get pregnant. It is thought this disruption may somehow increase the chance of an embryo implanting, and therefore creating a pregnancy.

Endometrial scratching can be done with many different instruments. The most common technique is the endometrial biopsy procedure, normally done with a thin flexible plastic tube, 3mm wide, called a pipelle catheter. The pipelle is inserted through the cervix (neck of the womb) into the womb, where it is moved back and forth and rotated in order to cause some disruption. This is the very same procedure a gynecologist would use in order to get an endometrial sample for analysis, where it is called an endometrial biopsy. The procedure has been re-purposed and re-named as endometrial scratching recently due to its potential use in the fertility area. It is a simple, low-cost procedure which can be done at an outpatient appointment, without anesthetic, in just a few minutes. It can cause some discomfort or pain. Risks of endometrial scratching include infection and uterine perforation, but these are very rare . The endometrium is gently scratched using the hysteroscope or a thin catheter (fine flexible sterile plastic tube) which is passed through the cervix(Lie et., al 2011)⁵. It is not clear what the biological process is that may lead to an increased probability of pregnancy. One theory is that endometrial scratching causes some sort of inflammatory response within the endometrium, similar to a scratch on any other part of the body. It may be that the wound healing response following the scratch improves the environment of the endometrium and makes it more likely for an embryo to implant and create a pregnancy.

The aim of the study:

To assess the role of endometrial injury (scratching) on pregnancy rate in women of unexplained infertility.

Patients and Methods:

The study included 100 women from Libya from the period between March 2017 to February 2018.

For evaluation 100 women from infertility clinic to evaluate the role of endometrial scratch in pregnancy rate in women with unexplained infertility. Written Consent was taken from every women according to the hospital protocol for data retrieval for research purpose at time of admission after ensuring the confidentiality.

Inclusion criteria

Age: 20-35y

Unexplained infertility (1ry& 2ry infertility).

- Normal hormonal profile of infertile woman
- Normal hysterosalpingogram
- Normal laparoscopy
- Normal investigation of the cervical factor.
- Fertile semen analysis (according to world health organization criteria 2015)

Exclusion criteria

Infertile semen analysis

Abnormal laparoscopic findings.

Abnormal HSG.

Abnormal hormonal profile.

Evidence of cervical factor.

Known genetic disorder.

Known autoimmune disease.

A total of 100 women with unexplained infertility aged 20-35 years old were randomly divided into two groups through closed envelope randomization

1- Study group (50 patients):

Induction of ovulation Was done by clomphine citrate (selective estrogen modulator of triphenylethylene group, produced by Sanafi A

ventis company) from 3rd day of cycle till 7th day of cycle and HMG 75IU (Merional) produced by IBSA (institute biochimique SA) given from 6th day of cycle till 8th of cycle once daily. Folliculometry done regularly during induction of ovulation till dominant follicle reached 18-20 mm in size.

Then endometrial injury performed in pre ovulatory day by a thin pipelle (a fine flexible, sterile, plastic tube) produced by Jiangsu Guard King Medical Equipment Co.

The procedure was carried out in preovulatory day (known when dominant follicle reached 18-20 mm in diameter), usually, done around day 14-day of the cycle.

In the theatre, patients put in a lithotomy position, sterilization was performed with the presence of good sources of light, and the procedure was carried out using a thin pipelle tube as follow:

A cuscoe's speculum was inserted into the vagina in order to visualize the cervix.

Cervix was grasped by volselum upwards backwards, and then pipelle tube passed through the cervix and uterine cavity, and then moved up and down to make a single induced scratch two times in the lining endometrium of posterior wall of uterus.

The procedure took approximately 15 minutes to complete.

It was uncomfortable or painful in some circumstances and that bleeding after the procedure happened in many cases. Post procedure antibiotics were given.

Couples were advised to practice timed sexual intercourse for next 6 months and couples in both groups were asked to phone a contact person whenever there was a missed period.

The patients followed up for six months for detection of the biochemical pregnancy if occurred.

2- Control group (50 patients):

They received the same induction of ovulation as first group but without performing endometrial injury in preovulatory day.

We wait till time of period if missed period achieved serum pregnancy test done after one week of missed period.

All women followed for 6 months after treatment.

Comparative study was done for both groups and resides presented in tables and statistically analyzed

Results:

There is no statistical difference between both groups as regard sociodemographic criteria Table [1](#).

Table1: Shows Demographic data and base line characteristics of the patients.

	Without Endometrial Scratch (n=50)	Without Endometrial Scratch (n=50)	P value
Age Range Mean± SD.	(21-34) 25.36 ± 3.44	(20-35) 26.72 ± 4.48	0.092
Marriage Duration Range Mean± SD.	(2-9) 4.38 ± 1.93	(2-10) 4.26 ± 1.87	0.753
Previous marriage	0 (0%)	0 (0%)	-----
BMI Range Mean± SD.	(19-27) 21.52 ± 2.38	(18-30) 22.34 ± 3.03	0.136

The pregnancy rate was significantly higher in study group as there were 10 cases (20%) got pregnant within 6 months follow up while in control group there were only 2 cases (4%) got pregnant within 6 months follow up(table 2)

Table 2: Shows the Follow up of cases for 6 months after treatment.

	Control Group (n=50)	Study Group (n=50)	P value
Pregnancy rate	2 (4%)	10 (20%)	0.028*
Duration of Pregnancy after injury (month) Range Mean \pm SD.	(0-1) 0.04 \pm 0.19	(0-1) 0.44 \pm 0.99	0.011*
Visible Pulsation at 5ws by TVS	50 (100%)	50 (100%)	-----
Abortion rate in early pregnancy before completed 13ws	2 (4%)	4 (8%)	0.400

Timing of pregnancy was insignificantly difference between both groups (table 3)

Table 2: Timing of occurrence of pregnancy at 2, 4, 6 months after treatment.

Time of Pregnancy after scratching in month	Control Group (n=50)	Study Group (n=50)	P value
After 2 months	2 (4%)	6 (12%)	0.269
After 2 months	0 (0%)	4 (8%)	0.242
After 2 months	0 (0%)	0 (0%)	-----

Discussion

This is a prospective case control study where 100 unexplained infertility patients divided randomly into two groups clomiphene citrate used as a method of induction of preovulatory endometrial scratching was done for the study group only.

All patients followed up for 6 months to detect rate of pregnancy for both groups. Our results show increased pregnancy rate among endometrial scratching group at 20% while only 4 % in the control group got pregnant which considered significantly different.

These results are similar to those obtained by Ebrahim et al., 2013⁶ who concluded that the pregnancy rate was significantly higher in

the endometrial injury group compared to the control group [17/114 (14.9%) vs. 6/113 (5.8%) (OR: 2.83 95% CI:1.07-7.49, p=0.09)].

Also, our results are similar to that of Maged et al, 2016⁷ who found that the cumulative PR was significantly higher in group S (39 %) compared to group C (18.2%). The PR in group S was significantly higher to that in group C at the second and third trials.

Zouh et al2008⁸., who also investigated the possibility that local injury to the endometrium in COH cycle improves the incidence of embryo implantation in IVF-ET, ET and found the local injury to the endometrium during a COH cycle improved the rates of embryo implantation, clinical pregnancy, and live birth in ART.

However, our results against those obtained by Karimzade et al 2010⁹ and colleagues, they evaluated the effect of local injury to our endometrium on the day of oocyte retrieval of implantation and pregnancy rate in assisted reproduction cycles. The results demonstrate that local injury to the endometrium on the day oocyte retrieval. Disrupted the receptive endometrium and had a negative impact on implantation in IVF cycles.

As regard abortion rate no significant difference was found between the two groups concerning the abortion rate (p=0.4). These results are in agreement with Brash et al2003¹⁰ who found that pre-implantation endometrial scratching doubled the rate of getting pregnancy and not affecting the abortion rate.

The mechanisms by which the endometrial scratching could be beneficial for increased pregnancy rate is it might enhance endometrial rapid growth of endometrial cells.

Also, it enhances a massive secretion of different cytokines and growth factors which are beneficial for embryo implantation, Also, the

last mechanism is synchronization of endometrial and embryo development. Mirkin et al 2004¹¹ reported that COH cycle rusted in different structural and function changes in comparison to natural cycle, including histological advancement, pinopodes maturation advancement, and steroid receptor down-regulation.

In **conclusion** the results of the current study need to be confirmed by further studies on other populations.

Endometrial local injury could be considered as one of the treatment options for selection UI couples whose infertility most likely due to implantation failure.

This simple, easy, and cost-effective procedure is worth considering in infertile couples especially in younger couples with shorter duration of infertility before complex imposed through such interventions.

More research is needed to confirm whether or not endometrial scratching can truly help couples to get pregnant and have a baby.

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