# Clinical Trial Protocol
# Iranian Registry of Clinical Trials

20 Sep 2026

## Comparison of Hormone replacement therapy with mild ovarian stimulation as endometrial preparation protocols for frozen-thawed embryo transfer in polycystic ovarian syndrome

## Protocol summary

**Study aim**

Comparison between the effectiveness of letrozole and hormone replacement therapy in frozen embryo transfer technique in polycystic ovarian syndrome (PCOS)

**Design**

This is a randomized controlled trial on 130 infertile women with polycystic ovary syndrome (PCOS) who underwent invitro fertilization (IVF) or itracytoplasmic sperm injection (ICSI) and frozen embryo transfer. The eligible patients will be randomly allocated into two groups: stimulated cycle with letrozole and human menopausal gonadotropin (HMG; intervention group) and routine artificial hormonal endometrial preparation (control group). The permuted block randomization will be conducted according to a computer-generated list. The patients' enrolment and assignment to groups will be carried out by a researcher midwife in the clinic. Each patient will participate in the study only once and if she has written consent.

**Settings and conduct**

The study is conducted in Arash Womens Hospital in Baghdarnia St., Tehran, Iran. PCOS diagnosis is based on the Rotterdam criteria. The physician, the researcher midwife and the patient all are aware of received treatment.

**Participants/Inclusion and exclusion criteria**

Women with polycystic ovarian syndrome and infertility who are candidate for frozen embryo transfer Inclusion criteria: 1. Age 20-35 years; 2. First or second embryo transfer cycle; 3. Normal uterine cavity Exclusion criteria: 1. Severe male factor; 2. pregestational diagnosis; 3. Severe endometriosis; 4. Concurrent immune disease; 5.Follicle stimulating hormone level > 10 IU/ml; 6. Body mass index >= 30 Kg/m2

**Intervention groups**

Patients will randomly selected in two groups to receive either (i) estradiol valerate or (ii) concurrent administration of letrozole and Human Menopausal Gonadotropine (HMG) for ovulation induction

**Main outcome variables**

Number (ratio) of successful pregnany Number (ratio) of abortion

## General information

**Reason for update**

**Acronym**

**IRCT registration information**

IRCT registration number: **IRCT20090526001952N12**
Registration date: **2020-03-30, 1399/01/11**
Registration timing: **retrospective**

Last update: **2020-03-30, 1399/01/11**
Update count: **0**

**Registration date**

2020-03-30, 1399/01/11

**Registrant information**

**Name**
Ashraf Moini
**Name of organization / entity**
Tehran University of Medical sciences
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**Recruitment status**

**Recruitment complete**

**Funding source**

**Expected recruitment start date**

2018-09-23, 1397/07/01

**Expected recruitment end date**

2019-05-22, 1398/03/01

**Actual recruitment start date**

2018-09-23, 1397/07/01

**Actual recruitment end date**

2019-09-22, 1398/06/31

**Trial completion date**

2020-03-19, 1398/12/29

**Scientific title**

Comparison of Hormone replacement therapy with mild ovarian stimulation as endometrial preparation protocols for frozen-thawed embryo transfer in polycystic ovarian syndrome

**Public title**

Comparison of two endometrial preparation protocols for frozen-thawed embryo transfer in polycystic ovarian syndrome

**Purpose**

Treatment

**Inclusion/Exclusion criteria**

**Inclusion criteria:**

Age 20- 35 Years First or second cycle of embryo transfer Normal uterine cavity

**Exclusion criteria:**

Severe male factor Patients with pregestational diagnosis Severe endometriosis Concomitant immunologic disease Follicle stimulating hormone more than 10 IU Body mass index equal or more than 30

**Age**

From **20 years** old to **35 years** old

**Gender**

Female

**Phase**

3

**Groups that have been masked**

- Participant

**Sample size**

Target sample size: **120**

Actual sample size reached: **135**

**Randomization (investigator's opinion)**

Not randomized

**Randomization description**

**Blinding (investigator's opinion)**

Single blinded

**Blinding description**

In the present study, the gynecologist (fellowship in infertility) and an attending physician (also gynecologist - assistant professor) will be aware of the treatment. Although the patient has been already informed about the study and the treatment arms; however, she will not know about the treatment she received.

**Placebo**

Not used

**Assignment**

Parallel

**Other design features**

## Secondary Ids

empty

## Ethics committees

### 1

**Ethics committee**

**Name of ethics committee**

Ethics Committee of Tehran University of Medical Sciences

**Street address**

Baghdarnia St.

**City**

Tehran

**Province**

Tehran

**Postal code**

1653915981

**Approval date**

2020-01-29, 1398/11/09

**Ethics committee reference number**

IR.TUMS.MEDICINE.REC.1398.834

## Health conditions studied

### 1

**Description of health condition studied**

Polycystic ovarian syndrome

**ICD-10 code**

E28.2

**ICD-10 code description**

Polycystic ovarian syndrome

## Primary outcomes

### 1

**Description**

Number (ratio) of successful pregnancy

**Timepoint**

40 weeks after study initiation

**Method of measurement**

Medical examination and ultrasound

## Secondary outcomes

empty

## Intervention groups

### 1

**Description**

Intervention group 1: This group will be received estradiol valerate (Aboureihan Co.). On day 3 after LMP, estradiol valerate is administered at the dose of 4 mg and will be increased after 3 days to 6 mg. The patient will be examined after a week. An endometrial thickness of 8 mm or more is optimum for progesterone administration (Cyclogest, Actoverco), otherwise the dose of estradiol will be increased up to 8 mg. If the optimal endometrial thickness is not achieved after 20 days, embryo transfer will be canceled.

**Category**
Treatment - Drugs

## 2

**Description**
Intervention group 2: Patients will receive letrozole (Femara, Novartis; 2.5 mg, b.i.d.) on day 3 after LMP for 5 days. Afterward treatment with HMG (Karma Co.; 75-150 mg, daily) on day 5 - 9 after LMP. Endometrial thickness, follicle size, and LH serum levels are measured frequently and in case of follicle size of 12-13 mm, an LH measurement will be done on next visit. Transvaginal ultrasound will be performed every 3 days, while hormon therapy is continued. An endometrial thickness of 8 mm or more or a follicle size of 20 mm or more is good for HCG (Ronak Daru; 5000 - 10000 IU) administration for ovulation induction. On day 20th, if endometrial Thickness was less than 7 mm the transfer cycle will be canceled regardless of follicle condition.
**Category**
Treatment - Drugs

# Recruitment centers

## 1

**Recruitment center**
**Name of recruitment center**
Arash Women Hospital
**Full name of responsible person**
Dr. Azadeh Hosseini
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# Sponsors / Funding sources

## 1

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**Grant name**
**Grant code / Reference number**
**Is the source of funding the same sponsor organization/entity?**
Yes
**Title of funding source**
Tehran University of Medical Sciences
**Proportion provided by this source**
100
**Public or private sector**
Public
**Domestic or foreign origin**
Domestic
**Category of foreign source of funding**
*empty*
**Country of origin**
**Type of organization providing the funding**
Academic

# Person responsible for general inquiries

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## Person responsible for updating data

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## Sharing plan

**Deidentified Individual Participant Data Set (IPD)**
Yes - There is a plan to make this available
**Study Protocol**
Yes - There is a plan to make this available
**Statistical Analysis Plan**
Yes - There is a plan to make this available
**Informed Consent Form**
Yes - There is a plan to make this available
**Clinical Study Report**
Yes - There is a plan to make this available
**Analytic Code**
Not applicable
**Data Dictionary**
Not applicable
**Title and more details about the data/document**
Information regarding main consequence
**When the data will become available and for how long**
6 months after paper publication
**To whom data/document is available**
Researchers in academic institutes
**Under which criteria data/document could be used**
Systematic review and metaanalysis
**From where data/document is obtainable**
Dr. Ashraf Moini, Arash Women Hospital, 1653915981, Tehran, Iran Email: hosp_arash@tums.ac.ir
**What processes are involved for a request to access data/document**
Sending request to principle investigator
**Comments**