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# A controlled study to investigate the effect of a food supplement (Femifert™) on polycystic ovarian syndrome and metabolic syndrome in women

**Submission date**
15/04/2019

**Recruitment status**
No longer recruiting

**Registration date**
23/04/2019

**Overall study status**
Completed

**Last Edited**
24/04/2019

**Condition category**
Nutritional, Metabolic, Endocrine

[X] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[_] Results
[_] Individual participant data
[_] Record updated in last year

## Plain English summary of protocol

Background and study aims
Polycystic ovarian syndrome (PCOS) is a very common condition affecting women. PCOS is a set of symptoms due to elevated androgens (male hormones) in females. Signs and symptoms of PCOS include irregular or no menstrual periods, heavy periods, excess body and facial hair, acne, pelvic pain, difficulty getting pregnant, and patches of thick, darker, velvety skin.
Recent research suggests that PCOS should no longer be considered purely a disorder of the reproductive organs. Although the origin of the condition is unknown, recent evidence suggests that affected women seem to have mild insulin resistance. Increased insulin production stimulates excess androgen production by the ovaries. Associated with the prevalent insulin resistance, these subjects exhibit high cholesterol and a predisposition to non-insulin dependent diabetes and cardiovascular disease in later life. Thus, PCOS seems to have many of the hallmarks of metabolic syndrome (a combination of diabetes, high blood pressure and obesity). Although drug treatment represents the first-line treatment for PCOS according to recent guidelines, other insulin sensitizing compounds from food sources may play a crucial role in the treatment of this condition. For example, D-chiro-inositol may improve both hormone and metabolic disturbances and reduce the risk of vascular disease. Femifert™ is a dietary supplement containing D-chiro-inositol, flaxseed dry extract, Ipomea Batatas, Lagerstroemia Speciosa (Banaba), zinc gluconate, vitamin B12, and folic acid. All these compounds may be useful to better control insulin metabolism and reduce symptoms associated with ovarian abnormalities.
The aim of this study is to analyze the improvement of metabolic profiles, hormonal parameters and ovarian parameters in women with PCOS and/or metabolic syndrome before and after 6 months of therapy with Femifert™, in combination with pharmacological treatment and compare these data with a group only pharmacologically treated.

Who can participate?
Females aged 18-65 who have been diagnosed with PCOS and/or metabolic syndrome

What does the study involve?
Participants are randomly allocated to one of two groups: the active group or the control group. The active group take one tablet of Femifert™ every day in combination with metformin, spironolactone, and rosuvastatin. The control group take only metformin, spironolactone, and rosuvastatin. The investigator collect the clinical documentation and biological samples. After a follow-up of 6 months, all subjects will be re-evaluated regarding the anthropometric, biochemical and ultrasound parameters.

What are the possible benefits and risks of participating?
The benefits of participating in this study is that the subjects may improve their metabolic profiles, as well as hormonal parameters and ovarian parameters. There are no expected risks in participating in this trial. Previous studies have not shown any side effects of the single compounds present in Femifert™ at the doses we are using.

Where is the study run from?
Antonio Cardarelli Hospital, Campobasso, Italy

When is the study starting and how long is it expected to run for?
April 2019 to May 2019

Who is funding the study?
Claride Pharma srl, Italy

Who is the main contact?
Dr Sergio Davinelli, sergio.davinelli@unimol.it

# Contact information

### Type(s)
Scientific


### Contact name
Dr Sergio Davinelli

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# Additional identifiers

### Protocol serial number
FMFRT01-IT

# Study information

## Scientific Title
Efficacy and tolerability of Femifert™ in women with polycystic ovarian syndrome and metabolic syndrome: a double-blind, randomized controlled trial

## Acronym
Femifert-POS/MS

## Study objectives
Femifert™, a combination of insulin-sensitizer compounds, would have beneficial effects on metabolic and hormonal abnormalities in women with polycystic ovary syndrome.

## Ethics approval required
Old ethics approval format

## Ethics approval(s)
Approved 06/03/2019, Ethics and Technical Committee - Department of Medicine and Health Sciences "V. Tiberio" (Comitato Tecnico Scientifico - Università degli Studi del Molise - Dipartimento di Medicina e Science per la Salute “V. Tiberio” - Via De Sanctis snc, Campobasso, 86100, Italy; +39 874 404 886; ciro.costagliola@unimol.it) ref: Prot. n.13/2019.

## Study design
Single-center double-blind randomized controlled trial

## Primary study design
Interventional

## Study type(s)
Treatment

## Health condition(s) or problem(s) studied
Polycystic ovarian syndrome and/or metabolic syndrome

## Interventions
The study consisted of two intervention treatments:
1. Active treatment (metformin, spironolactone, rosuvastatin, and Femifert™ dietary supplement)
2. Control treatment (metformin, spironolactone, and rosuvastatin)

Femifert™ tablets were a gift from Healthspan (Claride Pharma srl, Italy). Femifert™ is a dietary supplement containing D-Chiro-inositol (100 mg) Flaxseed dry extract (80 mg; standardized to 20% lignans), Ipomea Batatas (80 mg), Lagerstroemia Speciosa (80 mg), Zinc gluconate (50.4 mg), Vitamin B12 (4.5), and Folic Acid (0.6 mg). The daily amount of Femifert™ consumed by participants will be 550 mg during the intervention period (550 mg/day; 1 pill).

The study is a single-center, double-blind, randomized controlled trial. The intervention model will be a parallel assignment. At least 40 subjects will be randomized to a 24-week treatment period with a follow-up data collection (six months).
Active Group: Subjects with polycystic ovarian syndrome and/or metabolic syndrome will receive

oral pharmacological treatment with metformin, spironolactone, and rosuvastatin combined with Femifert™ supplementation (550 mg/day; 1 pill)
Control Group: Subjects with metabolic syndrome will receive oral pharmacological treatment with metformin, spironolactone, and rosuvastatin.

A randomization list will be created using PASS 2008 statistical software. The randomization sequence will be stratified using 10% maximum allowable% deviation with a 1:1 allocation ratio.

### Intervention Type
Supplement

### Primary outcome(s)
Timepoint measures: Baseline (T0); 8 weeks (T1); 16 weeks (T2); 24 weeks (T3):
1. Ovulatory dysfunction, menstrual frequency and variability of cycle length (amenorrhea; dysmenorrhea) measured using menstrual diary data.
2. The Ferriman–Gallwey score (hirsutism) measured using the Ferriman-Gallwey questionnaire.
3. Pelvic ultrasound to measure ovarian volume and number and volume of follicles.
4. Lipid profile (total cholesterol, LDL, HDL, and triglycerides) measured using traditional enzymatic methods.
5. Glycemic and insulinemic index curves.
6. Measurements of: 17-hydroxyprogesterone (17-OHP); sex hormone binding globulin (SHBG); dihydrotestosterone (DHT); 3 alpha-Androstanediol glucuronide (3 alpha diol-G); luteinizing hormone (LH); Follicle-stimulating hormone (FSH); prolactin (PRL); Dehydroepiandrosterone sulfate (DHEA-S); Thyroid-stimulating hormone (TSH) reflex measured using ELISA.

### Key secondary outcome(s))
Timepoint measures: Baseline (T0); 8 weeks (T1); 16 weeks (T2); 24 weeks (T3):
1. Weight, BMI, waist-hip ratio.
2. Polycystic Ovary Syndrome Questionnaire.
3. Treatment safety: liver and kidney function tests and the frequency, severity and nature of adverse events.
4. Adherence to study protocol.
5. Reasons for loss to follow-up.

### Completion date
01/06/2020

## Eligibility

### Key inclusion criteria
1. Female
2. Age 18-65
3. Triglycerides ≥150 mg/dl
4. HDL <40 mg/dl and/or LDL <150 mg/dl
5. Fasting glucose <110mg/dl
6. Blood pressure 145/95 mmHg
7. Waist circumference >88cm
8. Index of Ferriman & Gallway score >6
9. Hyperandrogenemia and hyperinsulinemia
10. Presence of 12 or more follicles in each ovary measuring 2-9 mm in diameter, and increased ovarian volume (>10 ml)

**Participant type(s)**
Patient

**Healthy volunteers allowed**
No

**Age group**
Adult

**Lower age limit**
18 years

**Upper age limit**
65 years

**Sex**
Female

**Key exclusion criteria**
1. Suffer from other causes of hyperandrogenism (e.g. Cushing's syndrome, congenital adrenal hyperplasia, androgen secreting tumors
2. Are pregnant, or suspected to be pregnant
3. History of liver or kidney pathologies
4. History of psychotic illness
5. Present with current and major depression
6 History of cardiovascular diseases
7. Regular consumption of micronutrient and/or herbal and/or polyphenol supplements known to have an impact on insulin sensitivity/secretion and/or vascular/endothelial function

**Date of first enrolment**
01/05/2019

**Date of final enrolment**
30/05/2019

# Locations

**Countries of recruitment**
Italy

**Study participating centre**
**Antonio Cardarelli Hospital**
Contrada Tappino
Campobasso
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86100

# Sponsor information

**Organisation**
Claride Pharma srl

# Funder(s)

**Funder type**
Industry

**Funder Name**
Claride Pharma srl

# Results and Publications

**Individual participant data (IPD) sharing plan**
The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request

**IPD sharing plan summary**
Available on request