

# Comparison of two therapies for hyperandrogenism in girls

<b>Submission date</b> 15/01/2010	<b>Recruitment status</b> No longer recruiting	<input type="checkbox"/> Prospectively registered
<b>Registration date</b> 06/04/2010	<b>Overall study status</b> Completed	<input type="checkbox"/> Protocol
<b>Last Edited</b> 08/07/2013	<b>Condition category</b> Nutritional, Metabolic, Endocrine	<input type="checkbox"/> Statistical analysis plan
		<input checked="" type="checkbox"/> Results
		<input type="checkbox"/> Individual participant data

**Plain English summary of protocol**  
Not provided at time of registration

## Contact information

**Type(s)**  
Scientific

**Contact name**  
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**Contact details**  
Hospital Sant Joan de Déu, University of Barcelona  
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## Additional identifiers

**Protocol serial number**  
PI09/90444

## Study information

**Scientific Title**  
Ethinil-estradiol cyproterone acetate versus low-dose metformin-flutamide-pioglitazone in girls with hyperinsulinemic androgen excess: effects on parameters of chronic inflammation, and on risk factors for type 2 diabetes and cardiovascular disease

**Acronym**  
DIO

**Study objectives**

Low-dose metformin-flutamide-pioglitazone will prove to be superior to ethynil-estradiol-cyproterone acetate in improving chronic inflammation and risk factors for type 2 diabetes and cardiovascular disease

Please note that as of 08/02/2011 the study has been updated. The study design of this trial has changed from a "Randomised 2 arm double blind active controlled parallel group trial" to a "Randomised 2 arm open-labeled active controlled parallel group trial".

**Ethics approval required**

Old ethics approval format

**Ethics approval(s)**

CEIC Fundacio Sant Joan de Déu approved on the 7th of October 2009

**Study design**

Randomised 2 arm open-labeled active controlled parallel group trial

**Primary study design**

Interventional

**Study type(s)**

Prevention

**Health condition(s) or problem(s) studied**

Hyperinsulinemic ovarian androgen excess

**Interventions**

Current interventions as of 08/02/2011:

Adolescents with androgen excess will be allocated to treatment with metformin-flutamide-pioglitazone or ethynil-estradiol-cyproterone acetate over 18 months.

Auxology, blood counts, liver and renal functions, endocrine-metabolic parameters (fasting blood) and body composition will be measured at 0 and 18 mo and at 6 mo after treatment stop

Previous interventions:

Adolescents with androgen excess will be allocated to treatment with metformin-flutamide-pioglitazone or ethynil-estradiol-cyproterone acetate over 12 months.

Auxology, blood counts, liver and renal functions, endocrine-metabolic parameters (fasting blood) and body composition will be measured at 0 and 12 mo and at 6 mo after treatment stop.

**Intervention Type**

Drug

**Phase**

Not Specified

**Drug/device/biological/vaccine name(s)**

Ethynil-estradiol cyproterone acetate, metformin-flutamide-pioglitazone

**Primary outcome(s)**

1. Insulin sensitivity measured by Homeostasis Model Assessment (HOMA)
2. Insulin
3. Abdominal fat measured by Dual Energy X-Ray Absorptiometry (DXA)
4. Abdominal visceral fat and intrahepatic lipid content
5. Intermuscular Adipose Tissue (IMAT) measured by Magnetic Resonance (MR)
6. Carotid intima media thickness (IMT) measured by Doppler sonography

**Key secondary outcome(s)**

1. Hirsutism measured by Ferriman & Gallwey score
2. Androgens
3. Triglycerides
4. Ultrasensitive C-reactive protein
5. Neutrophil/lymphocyte ratio
6. High molecular weight adiponectin
7. Changes in the size, number, and distribution of adipocytes determined by subcutaneous adipose tissue biopsy

**Completion date**

05/11/2011

**Eligibility****Key inclusion criteria**

1. Adolescent girls (14-17 yr)
2. Two or more yr beyond menarche
3. BMI less than the 97th centile for age
4. Clinical and biochemical signs of androgen excess (hirsutism [Ferriman & Gallwey score >8] and/or acne and/or menstrual irregularities)
5. Total testosterone >60 ng/dL and/or free androgen index >5
6. Hyperinsulinism: fasting insulin >15 uU/mL; glucose/insulin ratio <7, or peak insulin after an OGTT >100 uU/mL

**Participant type(s)**

Patient

**Healthy volunteers allowed**

No

**Age group**

Child

**Lower age limit**

14 years

**Upper age limit**

17 years

**Sex**

Female

## **Key exclusion criteria**

1. Pregnancy or pregnancy risk
2. Late-onset congenital adrenal hyperplasia due to 21-OH deficiency
3. Hyperprolactinemia
4. Cushing's syndrome
5. Hypothyroidism
6. Abnormal liver or kidney function, Creatine Phosphokinase (CPK) or Lactate Dehydrogenase (LDH)
6. Diabetes or impaired glucose tolerance
7. Cutaneous allergies
8. Treatment with anti-androgens, estroprogestagens, or medications interfering with lipid and carbohydrate metabolism during the previous 6 mo
9. Bacterial infections
10. Inflammatory intestinal conditions

## **Date of first enrolment**

01/02/2010

## **Date of final enrolment**

05/11/2011

## **Locations**

### **Countries of recruitment**

Spain

### **Study participating centre**

Hospital Sant Joan de Déu, University of Barcelona

Esplugues, Barcelona

Spain

08950

## **Sponsor information**

### **Organisation**

Hospital Sant Joan de Déu (Spain)

### **ROR**

<https://ror.org/001jx2139>

## **Funder(s)**

### **Funder type**

Hospital/treatment centre

### Funder Name

Instituto de Salud Carlos III (Spain) (ref: PI09/90444)

## Results and Publications

### Individual participant data (IPD) sharing plan

#### IPD sharing plan summary

Not provided at time of registration

#### Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Results article</a>	results	01/11/2011		Yes	No
<a href="#">Results article</a>	results	01/10/2012		Yes	No
<a href="#">Results article</a>	results	01/05/2013		Yes	No