Objective

It is well known that insulin resistance (IR) is associated with polycystic ovary syndrome (PCOS). Oxidative stress (OS) is, in turn, related to IR, with a vicious cycle. PCOS patients presented higher circulating concentrations of oxidative stress products such as homocysteine, malondialdehyde, an increase of superoxide dismutase and reduction of antioxidants such as glutathione and paraoxonase-1 activity. Most studies however concerned obese PCOS subjects.

In order to investigate parameters of OS in normal weight PCOS and the relationships with hormonal and metabolic parameters, we have evaluated the concentrations of Coenzyme Q₁₀ (CoQ₁₀), a component of mitochondrial respiratory chain, also endowed with antioxidant properties, in plasma of PCOS and normal menstruating women. Also malondialdehyde (MDA), a product of lipid peroxidation, was evaluated.

Methods

We have evaluated:
- n=7 PCOS patients, age 20-25 ys, mean BMI 24.8±2.6 and
- N=7 normal menstruating women, age 20-25 ys, mean BMI 22.0±2.5).

CoQ₁₀ levels were determined by HPLC according to Takada et al. and MDA levels were determined spectrophotometrically at 535 nm by TBARS assay.

Hormonal studies included evaluation of: TSH, fT₃, fT₄, IGF-1, Testosterone, DHEAS, Androstenedione (by CLIA method) and HOMA index. (Table 1)

Results

We did not find a significant difference in MDA (in PCOS patients mean±ES: 7020±2474 pmol/ml vs 12380±2198.9 in controls) and CoQ₁₀ (577.2±41.6 pmol/ml vs 495.6±38.8). (Fig.1a-b)

PCOS patients showed a trend toward a lower fT₃ levels (2.8±0.07 vs 3.3±0.12 pg/ml) and higher IGF-1 levels (303±9.68 vs 279.2±46.1 ng/ml).

Conclusions

These preliminary data suggest that OS is not simply related to IR in normal weight PCOS but there is a complex interplay between hormones influencing follicular growth. They need to be extended to furnish further insight into the mechanisms of hyperandrogenism in such a condition and to give a rationale for a therapeutic employment of antioxidants in PCOS.

Table 1. Mean±ES in PCOS patients and controls

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<thead>
<tr>
<th></th>
<th>TSH (µIU/l)</th>
<th>fT₃ (pg/ml)</th>
<th>fT₄ (pg/ml)</th>
<th>IGF-1 (ng/ml)</th>
<th>T (ng/ml)</th>
<th>DHEAS (ng/ml)</th>
<th>A (ng/ml)</th>
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<tbody>
<tr>
<td>PCOS (n=7)</td>
<td>1.71±0.07</td>
<td>2.8±0.07</td>
<td>9.65±0.20</td>
<td>303±9.68</td>
<td>0.77±0.09</td>
<td>3478±69.91</td>
<td>2.11±0.23</td>
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<tr>
<td>Controls (n=7)</td>
<td>279.25±0.14</td>
<td>3.3±0.13</td>
<td>11.12±0.29</td>
<td>279.25±47.87</td>
<td>0.55±0.03</td>
<td>2742.33±265.75</td>
<td>2.06±0.21</td>
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