A NOVEL AND UNIFYING APPROACH TO PREDICT ENDOMETRIAL RECEPTIVITY:
SIGNIFICANCE OF HORMONAL RATIOS TO OOCYTE NUMBER IN IN-VITRO FERTILISATION

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Introduction

Elevation of Pg > 0.9 ng/mL on the day of hCG
- Used to define premature luteinisation in long agonist protocols
- But has been described with comparable LH values;
- Influence on implantation rate controversial;
  - Negative (Schoenfeld 91, Mil 92, Fehilly 93)
  - Positive or no effect (Silverberg 91, meta-analysis Venetis 2007, Gorospe-Tricot 94, Holstein 94, Altmann 94,_locher 94, Loechner 94)
- Pg/E2 > 1 ratio also proposed
  - Antagonist protocol in normal responders - premature ovulation resulting in fewer oocytes;
  - Long agonist protocol in poor responders - lower implantation rate related to poor oocyte quality;
- No study ever correlated these hormonal values with the number of mature oocytes

Objective

To define a hormonal ratio that could help determine the endometrial receptivity in any type of cycle, regardless of ovarian response, etiology of infertility or stimulation protocol.

Materials and methods

Prospective observational study at OVO FERTILITY
- 275 IVF cycles from September 2009 to May 2010;
- E2(pg/mL) and Pg(ng/mL) measured on day of hCG;
- Pg/E2 ratio(Pg ng/mL x 1000/E2 pg/mL), Pg/mature oocyte, Pg/E2 per mature oocyte calculated;
- Evaluation of impact of these hormonal ratios on clinical pregnancy rate and implantation rate;
- In this study, absolute Pg value was not a good predictor of pregnancy - Pg > 0.9ng/mL had higher pregnancy rates.
- Defining arbitrary Pg/E2 ratio of 1 also was not predictive of outcome.
- However, Pg/E2 ratio per MI and Pg per MI were predictive of pregnancy with statistically significant results.
- Advantage of these ratios is that they are applicable in all types of cycles including poor or high responders.
- Study is ongoing to increase the sample size and add significance.
- In future, these calculations could assist in decision whether to perform embryo transfer in current cycle or to freeze embryos and replace them in a cycle where the endometrium would be more receptive, thereby increasing the success rate.

Results - Pg/E2 ratio per MI oocyte

<table>
<thead>
<tr>
<th>Cause of infertility</th>
<th>Pregnant</th>
<th>Not pregnant</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>TUBAL</td>
<td>36(51.4%)</td>
<td>29(42.4%)</td>
<td>0.63^2</td>
</tr>
<tr>
<td>PCOS</td>
<td>74(61.7%)</td>
<td>54(43.5%)</td>
<td>0.0009^</td>
</tr>
<tr>
<td>UNEXPLAINED</td>
<td>8.51 ± 5.47</td>
<td>8.51 ± 5.47</td>
<td>1.0</td>
</tr>
<tr>
<td>INFERTILITY + LOW OR</td>
<td>11.29 ± 5.43</td>
<td>11.29 ± 5.43</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Results by Pg value and Pg/E2 ratio

| Fertilisation rate/oocyte | 58.5% | 60.8% | 0.33^2 |

Results - Pg/MII oocyte ratio

| Population | 275 patients with IVF cycle | 74 Pg or E2 missing | 190 patients | 9 cases no embryo transfer + 1 pregnancy awaiting ultrasound | 70 clinical pregnancies |

References

Younis JS, Moshe M, Radin O, Moshe BA. Increased progesterone/estradiol ratio in the late follicular phase could be related to low ovarian reserve in in vitro fertilization-embryo transfer cycles with a long agonist releasing hormone agonist. Fertil Steril 2001;76:294-299.