In PGD, the number of embryos available for transfer is significantly lower than in regular IVF.
665 PGD cycles with aCGH and 2558 trophectoderm biopsies

- Advanced Maternal Age (≥39-44): 80.2% aneuploid
- Translocation: 71.6% unbalanced

Probability of finding euploid embryo:

- 40% Euploid
- 70% Balanced & Euploid
- Translocations
- Aneuploidy for AMA (aCGH)
- HLA
- SGD Only

61.6% of euploid embryo after SGD & HLA typing
Determinants of Clinical Success

- Female Age
- Ovarian reserve
- Finding Transferrable Embryo(s)

Role of Ovarian Reserve
Most effective current methods for the assessment of ovarian reserve

**Antral Follicle Count (AFC)**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Severe DOR</th>
<th>DOR</th>
<th>Normal</th>
<th>PCO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade I</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade II</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade III</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade IV</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Anti-Mullerian Hormone (AMH) (ng/ml)**

- <0.5: severe DOR*
- 0.5-1: DOR
- 1.1-3.5: Normal
- >3.5: Hyperresponder

* Diminished ovarian reserve
We looked at:

- **Euploidy Rate (ER):** (rate of euploid embryos per diagnosed embryo)
- **Probability of finding euploid embryo(s) per cycle (POE)**

**According to**

- Maternal age
- Ovarian reserve: (AMH level)
- Ovarian response
  - No of cumulus oocyte complexes (COCs)
  - No of mature oocytes (MII)
  - No of biopsied embryos

**Euploidy Rate & Probability of Finding Euploid Embryo per Cycle According to Maternal Age**

![Graph showing euploidy rate and probability of finding at least 1 euploid embryo per cycle according to maternal age. The graph includes data points for age groups: <35 (n=96), 35-37 (n=48), 38-39 (n=69), 40-41 (n=137), 42-43 (n=86), ≥44 (n=38).](image)

- Euploidy Rate: p<0.05, Linear Regression
- At Least 1 Euploid Embryo: p<0.05, Binary Logistic Regression
ER and POE per cycle according to retrieved oocytes (COCs) after adjusted for age

Probability of finding at least one euploid embryo

**P<0.05

&P>0.05

Euploidy Rate → Euploidy/diagnosed embryos

*binary logistic regression adjusted for age
&linear regression adjusted for age

Euploid or no euploid embryos according to ovarian reserve and response

*p<0.05 conducted by Student’s t-Test
% of cycles with at least one euploid embryo based on AMH subgroups in AMA patients (n=394)

<table>
<thead>
<tr>
<th>AMH subgroups</th>
<th>Number of Biopsied Embryo(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0-0.1</td>
<td>1</td>
</tr>
<tr>
<td>0.2-0.5</td>
<td>2</td>
</tr>
<tr>
<td>0.6-1.3</td>
<td>3</td>
</tr>
<tr>
<td>1.4-2.5</td>
<td>4</td>
</tr>
<tr>
<td>2.6-3.5</td>
<td>5</td>
</tr>
<tr>
<td>≥3.6</td>
<td>≥5</td>
</tr>
</tbody>
</table>

Age

Number of Biopsied Embryo(s) | 1 | 2 | 3 | 4 | ≥5 |
-----------------------------|---|---|---|---|----|
35-37                        |   |   |   |   |    |
38-39                        |   |   |   |   |    |
40-41                        |   |   |   |   |    |
42-43                        |   |   |   |   |    |

Probability of Finding at Least One Euploid Embryo According to Number of Biopsied Embryo and Age
Euploid or no euploid embryos according to cycle characteristics

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>D3 FSH (mlu/ml)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No euploid</td>
<td>135</td>
<td>8.2</td>
<td>3.3</td>
<td>0.083</td>
</tr>
<tr>
<td>Euploid</td>
<td>118</td>
<td>7.5</td>
<td>2.8</td>
<td></td>
</tr>
<tr>
<td><strong>Total Gnt dose (IU)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No euploid</td>
<td>248</td>
<td>2227.9</td>
<td>1085.3</td>
<td>0.008</td>
</tr>
<tr>
<td>Euploid</td>
<td>407</td>
<td>2017.2</td>
<td>795.8</td>
<td></td>
</tr>
<tr>
<td><strong>Mean Gnt dose (IU)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No euploid</td>
<td>248</td>
<td>265.3</td>
<td>86.6</td>
<td>0.008</td>
</tr>
<tr>
<td>Euploid</td>
<td>406</td>
<td>236.9</td>
<td>70.2</td>
<td></td>
</tr>
<tr>
<td><strong>Days of stimulation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No euploid</td>
<td>248</td>
<td>8.2</td>
<td>1.9</td>
<td>0.05</td>
</tr>
<tr>
<td>Euploid</td>
<td>406</td>
<td>8.5</td>
<td>1.7</td>
<td></td>
</tr>
</tbody>
</table>

*Independent samples t-test
Variables affecting finding euploid embryo

<table>
<thead>
<tr>
<th></th>
<th>OR</th>
<th>95.0% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ovarian reserve</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGE</td>
<td>0.81</td>
<td>0.76-0.87</td>
</tr>
<tr>
<td>AMH(ng/ml)</td>
<td>1.17</td>
<td>1.04-1.31</td>
</tr>
<tr>
<td><strong>Ovarian response</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGE</td>
<td>0.80</td>
<td>0.75-0.85</td>
</tr>
<tr>
<td>COC</td>
<td>1.09</td>
<td>1.06-1.13</td>
</tr>
<tr>
<td>MII</td>
<td>1.13</td>
<td>1.08-1.18</td>
</tr>
<tr>
<td>AGE</td>
<td>0.81</td>
<td>0.76-0.87</td>
</tr>
<tr>
<td>Biopsied embryo</td>
<td>1.66</td>
<td>0.43-1.92</td>
</tr>
</tbody>
</table>

Binary Logistic Regression Analysis

---

**Live Birth Rate per cycle According to Number of Oocytes Retrieved for all Age Groups**

- COC: 15
- Live Birth Rate: 30

- COC: 20
- Live Birth Rate: 35

- COC: 25
- Live Birth Rate: 40

- COC: 30
- Live Birth Rate: 30

- COC: 35
- Live Birth Rate: 25

- COC: 40
- Live Birth Rate: 20

- COC: 45
- Live Birth Rate: 15

---

MEMORIAL
What is the **LIVE BIRTH RATE/ET** after finding an euploid embryo?

**Conclusions**

**Euploidy Rate**

- **Age** is the most significant predictor
- **Euploidy rate** does not directly correlate with the **number of oocytes retrieved** after adjusted for age
Conclusions
POE

Probability of finding at least one euploid embryo decreases significantly with the advancing maternal age.

Conclusions
Ovarian reserve and response

AMH level, number of COCs, number of MII oocytes and number of biopsied embryos are the main variables effecting finding at least one euploid embryo after adjusted for age.
Conclusion

**lowest probability**

Finding a euploid embryo and reaching a live birth

- AMH < 0.6 ng/ml
- <5 COCs

**Conclusion**

**Highest probability**

Finding a euploid embryo

- >15 COCs
- ≥5 biopsied blastocysts
Conclusion

highest probability

Resulting in a live birth

15-20 COCs

≥5 biopsied blastocysts

Conclusion

lowest probability according to age

Finding a Euploid Embryo & Resulting in a Live Birth

>42 years of age

> 42 years of age
Conclusion

Counseling patients for their chances of finding an euploid embryo based on their age and number of retrieved oocytes or biopsied embryos is the best approach.

...we do need to remember the importance...
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