A comparison of aneuploidy rates between Asian and Caucasian patients

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Background

• Previous observational studies have shown Asian women undergoing in vitro fertilization (IVF) without pre-implantation genetic screening (PGS) have lower pregnancy and live birth rates relative to Caucasian patients, but have failed to identify an etiology for this discrepancy (Langen, 2010).

• Aneuploidy is responsible for a significant portion of IVF treatment failures and miscarriages (Lathi, 2014).

• Different aneuploidy rates between Asian and Caucasian patients would be a possible explanation for the observed difference in IVF outcomes.

• No prior studies have investigated if embryo aneuploidy rates vary between different ethnicities among patients undergoing IVF with PGS for infertility.

Objective

• To determine if there is a difference in aneuploidy rates between Asian and Caucasian patients undergoing IVF with PGS for infertility.

• To determine if there is a difference in the ability to proceed with a euploid embryo transfer (≥1 euploid embryo) between Asian and Caucasian patients.

Materials & Methods

• Retrospective cohort study of all autologous and donor IVF cycles utilizing PGS at a single infertility clinic between January 2012 to December 2013.

• Inclusion limited to embryos screened with 24 chromosome analysis by aCGH or SNP array with available results.

• Inclusion limited to cycles with patient or oocyte donor ethnicity available.

• Inclusion limited to patients identified as Asian or Caucasian ethnicity.

• Charts reviewed for patient or donor age at oocyte retrieval, oocyte yield, and PGS results.

• Statistical analysis using Chi square and Fisher’s exact test.

Results

• Study included 2,439 embryos.

  • 308 patients
    • Mean age 30.6 years old
    • Overall aneuploidy rate 58.2%
    • 736 embryos from Asian patients
    • 1,703 from Caucasian patients

I. Aneuploidy rate stratified by age and ethnicity

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Asians</th>
<th>Caucasians</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 25</td>
<td>66%</td>
<td>49%</td>
<td>0.10</td>
</tr>
<tr>
<td>26 to 29</td>
<td>50%</td>
<td>52%</td>
<td>0.71</td>
</tr>
<tr>
<td>30 to 35</td>
<td>61%</td>
<td>60%</td>
<td>0.84</td>
</tr>
<tr>
<td>36 to 39</td>
<td>84%</td>
<td>78%</td>
<td>0.20</td>
</tr>
<tr>
<td>40 to 45</td>
<td>93%</td>
<td>85%</td>
<td>0.07</td>
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</tbody>
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II. (%) of patients with ≥ 1 euploid embryo (Ability to proceed with euploid embryo transfer)

<table>
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</thead>
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<td>91%</td>
<td>89%</td>
<td>0.89</td>
</tr>
<tr>
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<td>0.28</td>
</tr>
<tr>
<td>40 to 45</td>
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<td>37%</td>
<td>0.49</td>
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Conclusions

• No difference observed in aneuploidy rates between similarly aged patients who identify as Asian and those who identify as Caucasian.

• No difference in ability to proceed with euploid embryo transfer between cohorts stratified by age and ethnicity.

• In our patient population, there was no observed embryo ploidy related difference between Asian and Caucasian age controlled cohorts that would explain the previously observed differences in IVF outcomes between these patient populations.

• Other etiologies that may vary with ethnicity and explain a difference in IVF outcomes, including endometrial receptivity and non-ploidy related embryo viability, should be evaluated.

Limitations

• Ethnicity self-reported and does not account for mixed-ethnicity.

• Does not control for other aspects that may affect aneuploidy rate (ovarian reserve, paternal contributions).

References
