The Effect of Ethnicity and Race on Semen Analysis and Hormones in the Infertile Patient

Nahid Punjani1, Madhur Nayan2, Ethan Grober3, Kirk Lo3, Susan Lau2, Keith Jarvi2

1 Division of Urology, Department of Surgery, Western University, London, Ontario, Canada
2 Division of Urology, Department of Surgery, University of Toronto, Toronto, Ontario, Canada

OBJECTIVE

- To determine if race and ethnicity have any impact on semen analysis or baseline hormonal profiles for men with infertility

INTRODUCTION

- Numerous studies have shown differences in disease biology, outcomes and treatments based on race and ethnicity
- Limited data exists with regards to the effect of race or ethnicity on semen parameters and hormones in men with infertility

METHODS

Study Design and Setting:
- Population based, prospectively collected retrospective study using patient survey and laboratory data (2008-2017)
- All men who presented a single tertiary institution for male infertility work-up

Questionnaire:
- Self-reported questionnaire to collect data on:
  - Demographics & clinical history

Ethnicities:
- Caucasian
- Native-Canadian
- African-Canadian
- Hispanic
- Asian
- Middle Eastern
- Indo-Canadian

Semen Parameters:
- Assessed using 2010 World Health Organization Criteria
- Recorded parameters included
  - Volume
  - Count
  - Morphology
  - Motility
  - Vitality

Hormone Levels
- Total Testosterone (nmol/L)
- FSH levels (mIU/ml)

Statistical Analysis:
- Reported medians (IQR) and frequencies (count) for demographics
- Linear regression for ethnicity and hormonal profiles
- Multivariate logistic regression for ethnicity and semen parameters

RESULTS

Table 1 – Demographics by Ethnicity

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Sample Size</th>
<th>Mean Age</th>
<th>Median FSH (mIU/ml)</th>
<th>Median Testosterone (nmol/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caucasian</td>
<td>2226</td>
<td>39.9</td>
<td>8.0 (5.5-11.4)</td>
<td>12.8 (9.9-16.2)</td>
</tr>
<tr>
<td>Native-Canadian</td>
<td>283</td>
<td>39.7</td>
<td>7.1 (5.0-10.0)</td>
<td>11.0 (8.5-15.0)</td>
</tr>
<tr>
<td>African-Canadian</td>
<td>843</td>
<td>40.1</td>
<td>7.2 (5.1-10.0)</td>
<td>11.2 (9.0-15.0)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>167</td>
<td>39.6</td>
<td>7.3 (5.2-10.0)</td>
<td>12.0 (9.5-16.0)</td>
</tr>
<tr>
<td>Asian</td>
<td>216</td>
<td>39.8</td>
<td>7.4 (5.3-10.0)</td>
<td>12.5 (9.6-16.0)</td>
</tr>
<tr>
<td>Middle Eastern</td>
<td>298</td>
<td>40.0</td>
<td>7.5 (5.4-10.0)</td>
<td>13.0 (9.7-16.0)</td>
</tr>
<tr>
<td>Indo-Canadian</td>
<td>167</td>
<td>39.6</td>
<td>7.6 (5.5-10.0)</td>
<td>13.5 (10.0-17.0)</td>
</tr>
</tbody>
</table>

Table 2 – Multivariate Logistic Regression for Semen Parameters vs. Ethnicity

Table 3 – Linear Regression for Hormones and Ethnicity

SUMMARY/CONCLUSION

- Differences do exist amongst racial and ethnic groups for hormonal profiles and semen parameters
- Further study is needed to understand the nature of these differences (ie. genetics, biology etc.)
- This may provide insight into the work-up and management for infertile patient