Title:

EFFECTS OF ADVANCING PATERNAL AGE ON OXIDATIVE STRESS IN INFERTILE MEN

1Center For Reproductive Medicine, Glickman Urological and Kidney Institute and OB/ Gyn and Women's Health Institute, 9500 Euclid Avenue, Desk A 19.1 Cleveland, OH, United States, 44195.

Objective: Paternal age is reported to affect both sperm quality and DNA damage. We examined the age related changes in oxidative stress (OS) markers in infertile men.

Design:

Prospective clinical study.

Materials and Methods: Semen samples collected from 99 infertile men were divided into 4 groups: group 1: <30y (n = 10); group 2: 30-34y (n = 35); group 3: 35-39 (n = 26) and group 4: ≥40y (n = 28). Reactive oxygen species (ROS), total antioxidant capacity (TAC) and sperm DNA fragmentation was measured. New OS scores were calculated by principal components and logistic regression analysis.

Results: When patients were grouped as <40 (n = 71) and ≥40y (n = 28), both TAC-TUNEL (51.63 ± 8.93 vs. 45.17 ± 11.27; P<0.018) and ROS-TAC-TUNEL (51.66 ± 9.21 vs. 46.16 ± 10.78; P<0.04) scores were significantly lower in older group of infertile men.
Table:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group I</th>
<th>Group II</th>
<th>Group III</th>
<th>Group IV</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROS (RLU/s X 10^6 sperm)</td>
<td>&lt; 30 y: 347.8 (174.5, 971.3)</td>
<td>30 - 34 y: 151.6 (64.6, 2120.1)</td>
<td>35 - 39 y: 45.15 (0, 546.2)</td>
<td>≥40 y: 305.9 (42.7, 1452.5)</td>
<td>0.07</td>
</tr>
<tr>
<td>TAC (micromoles Trolox)</td>
<td>1868.2 ± 634.4</td>
<td>2124.7 ± 567.3</td>
<td>1983.9 ± 685.9</td>
<td>1706.6 ± 694.8</td>
<td>0.24</td>
</tr>
<tr>
<td>TUNEL (%)</td>
<td>29.1 ± 25.2</td>
<td>29.3 ± 19.6</td>
<td>22.4 ± 19.8</td>
<td>31.1 ± 27.0</td>
<td>0.41</td>
</tr>
<tr>
<td>ROS-TAC</td>
<td>46.9 ± 8.4</td>
<td>51.5 ± 8.9</td>
<td>53.54 ± 10.1</td>
<td>46.3 ± 10.1</td>
<td>0.044 a</td>
</tr>
<tr>
<td>ROS-TUNEL</td>
<td>47.5 ± 9.8</td>
<td>49.33 ± 9.4</td>
<td>55.94 ± 7.8</td>
<td>47.1 ± 10.6</td>
<td>0.013 b</td>
</tr>
<tr>
<td>TAC-TUNEL</td>
<td>54.1 ± 7.1</td>
<td>49.26 ± 9.0</td>
<td>52.44 ± 9.1</td>
<td>47.7 ± 12.7</td>
<td>0.24 b</td>
</tr>
<tr>
<td>ROS-TAC-TUNEL</td>
<td>50.0 ± 8.2</td>
<td>49.21 ± 9.5</td>
<td>55.86 ± 7.8</td>
<td>46.2 ± 10.8</td>
<td>0.014 b</td>
</tr>
</tbody>
</table>

ROS = reactive oxygen species; RLU = relative light units; TAC = total antioxidant capacity; a = principal component analysis; b = logistic regression analysis

Conclusions: We demonstrate that individual markers of OS are not sensitive to detect differences in oxidative stress in different age groups. New OS scores may be used to study the association between OS and advancing age.

Support: None.

Author: Reda Z Mahfouz, MD
Member #: Phone: 216-444-4402 Cell Phone: Fax: 216-638-3100 E-mail: mahfour@ccf.org

Yes - Neither I nor my spouse/partner have a commercial or financial interest or relationship with manufacturers of pharmaceuticals, laboratory supplies and/or medical devices.

Support: None.

Author: Ashok Agarwal, PhD
Member #: Phone: Cell Phone: Fax: E-mail: agarwaa@ccf.org

Yes - Neither I nor my spouse/partner have a commercial or financial interest or relationship with manufacturers of pharmaceuticals, laboratory supplies and/or medical devices.

Support: None.

Author: Vaishali Kale, MS
Member #: Phone: Cell Phone: Fax: E-mail: vaishalik@ccf.org

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