The Effects of High Temperature and Direct Exposure Fire on the Fertility of Babylon City Baker's

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Abstract
The study include (10) fertile men and (18) infertile baker's, those whom exposure to high temperature and direct fire for many years during the work, that's may be causing of impaired sperm functions and insult spermatogenesis process to yield asthenospermic, oligospermic, oligoasthenospermic and azospermic men producing of infertile baker's lastly.

Introduction
This study established to investigate the effects of high temperature on some republic Babylon city, whom were exposure directly to fire high temperature, during their working as a baker's in bakershop. As well as, persons who facing a hole of great fire directly or near from the testicular scrotum.

Society, known that most of baker's are exposed for an elevated temperature reach about (50-60) °C inside bakershop area. Particularly during Iraqi Summer season.

Recent studies, has brought good news for high temperature, that is associated with the same subject, and the regard causes for incidence infertility in men.

Mieusset et al.,( 1987); Ei-Segini et al., (2002); Esfandiari et al., (2002).

Says, that, deviation of scrotal temperature may seem to significantly enhance decline of character sperm, and predict for infertility.

While Sinawat, S. (2000); Vermeulen, (1993). Studying on life style and environment contribution in male infertility. As where they found that physical factors; such as global temperature and radiation exposure may indicate as environmental factors in male fertility.

A scientists like Pryors & Haward (1987); Comhaire et al., (1991); Nakai et al., (2000); Referring that mammals testicular temperature is lower than core body temperature, and vulenable nature of spermatogenesis to thermal insult has been known for century.

However, the primary target affect by increase in temperature is not yet clear. In evaluation study assessment of testicular core temperature using microwave thermography; found that any altered testicular thermoregulation with and without varicocele patient may cause impairment spermatogenesis, which is finally lead to male infertility. Gazvani, et al., (2000).

While, Never and this colleagues, (2000), illustrate the effects of: hypertermic, free oxygen radicals and other element give a base foundation that might be act as causative agents for heat shock protein (HSP) which is first identified in cells after
exposure to elevated temperature (HSP) undergoing to production of infertile mammals.

**Materials & Methods**

According to WHO, (2000). Standard semen exam. Study were done on (18) infertile baker's as patient group, and (10) fertile control group. 

patients group are divided upon; Ages, tall and time of exposuring to high temperature.

However, the study include the following test:

**A- Physical and clinical exam for both patient & control groups:**

to determine varicocele test is atrophied.

**B- Seminal fluid analysis**

1- sperm concentration (count).
2- Sperm motility percentage.
3- Sperm grade activity.
4- Semen volume.
5- Color semen.
6- Semen liguefaction time.
7- Semen pH.
8- Semen viscosity.

**C- Other parameters study include:**

1- Age of baker's.
2- Tall of baker's.
3- Esposure time for high temperature.
4- Period of marriage with out pregnancy.

And table No. (1) Show information data of baker's patient group.

<table>
<thead>
<tr>
<th>Patient No.</th>
<th>Working as baker's (exposure years)</th>
<th>Age of baker's</th>
<th>Tall of baker's (direct exposure)</th>
<th>Marraige without pregnancy</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7 years</td>
<td>23 years</td>
<td>1.82 meter</td>
<td>3.0 years</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>6 years</td>
<td>23 years</td>
<td>1.79 meter</td>
<td>5.0 years</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>6 years</td>
<td>23.5 years</td>
<td>1.81 meter</td>
<td>7.0 years</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>5 years</td>
<td>24.0 years</td>
<td>1.72 meter</td>
<td>2.5 years</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>7 years</td>
<td>26.0 years</td>
<td>1.62 meter</td>
<td>6.0 years</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>8.5 years</td>
<td>26.0 years</td>
<td>1.73 meter</td>
<td>4.0 years</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>6.5 years</td>
<td>26.5 years</td>
<td>1.77 meter</td>
<td>2.5 years</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>3.5 years</td>
<td>27.0 years</td>
<td>1.62 meter</td>
<td>8.0 years</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>9.5 years</td>
<td>28.0 years</td>
<td>1.66 meter</td>
<td>2.0 years</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>6 years</td>
<td>28.0 years</td>
<td>1.71 meter</td>
<td>8.5 years</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>9 years</td>
<td>32.0 years</td>
<td>1.63 meter</td>
<td>7.0 years</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>11 years</td>
<td>33.0 years</td>
<td>1.56 meter</td>
<td>7.5 years</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>7.5 years</td>
<td>33.0 years</td>
<td>1.70 meter</td>
<td>7.0 years</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>12 years</td>
<td>34.0 years</td>
<td>1.68 meter</td>
<td>16.0 years</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>10.5 years</td>
<td>34.0 years</td>
<td>1.74 meter</td>
<td>5.5 years</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>23.5 years</td>
<td>44.0 years</td>
<td>1.70 meter</td>
<td>9.5 years</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>22.0 years</td>
<td>45.0 years</td>
<td>1.81 meter</td>
<td>19.5 years</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>23.0 years</td>
<td>45.0 years</td>
<td>1.68 meter</td>
<td>21.5 years</td>
<td></td>
</tr>
</tbody>
</table>
Results

After complete clinical diagnosis and laboratory examinations. The (18) infertile bakers were divided as following groups.

Group –I-: (5/48) patients (infertile bakers) had been show varicocele either in right or in left side testis.

Group –II-: (10/18) patients appeared as asthenospermic infertile bakers: (4/10) asthenospermia with varicocele and (6/10) asthenospermia without varicocele.

Group –III-: (5/18) patients showing oligoaesthenospermic infertile bakers.

Group –IV-: (3/18) patients appeared as azospermic infertile bakers.

Group –V- (5/18) patients with varicocele were subdivided to: (4/5) varicocele with asthenospermia patient and (1/5) varicocele with oligospermic infertile bakers.

And table No. (II), explain the results and diagnostic feature groups.
<table>
<thead>
<tr>
<th>Physical, clinical and spermatological examination features factors</th>
<th>sperm concentration (million/ml)</th>
<th>% sperm motility</th>
<th>sperm grade activity</th>
<th>volume semen</th>
<th>color semen</th>
<th>semen liquefaction time</th>
<th>semen pH</th>
<th>viscosity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varicoceles baker’s (5/18)</td>
<td>ranging 22×10^6-53×10^6</td>
<td>35</td>
<td>2</td>
<td>2.0 mL</td>
<td>whitish gray</td>
<td>ranging 15-30 min.</td>
<td>alkalin</td>
<td>normal</td>
</tr>
<tr>
<td>Varicoceles baker’s (4/5) with asthenospermia</td>
<td>ranging 22×10^6-53×10^6</td>
<td>30</td>
<td>2</td>
<td>2.0 mL</td>
<td>=</td>
<td>=</td>
<td>=</td>
<td>normal</td>
</tr>
<tr>
<td>Varicoceles baker’s (1/5) with Oligospermia</td>
<td>ranging 4.5×10^6 million/ml</td>
<td>18</td>
<td>1</td>
<td>1.7 mL</td>
<td>=</td>
<td>ranging 25 min.</td>
<td>=</td>
<td>=</td>
</tr>
<tr>
<td>Oligospermic baker’s (5/18)</td>
<td>ranging 4×10^6-10×10^6</td>
<td>25</td>
<td>1.5</td>
<td>1.6 mL</td>
<td>=</td>
<td>ranging 15-45 min</td>
<td>=</td>
<td>=</td>
</tr>
<tr>
<td>Asthenospermic baker’s (10/8) : 4/10 asthenospermia with var., 6/10 without var.</td>
<td>ranging 22×10^6-53×10^6</td>
<td>35</td>
<td>2</td>
<td>2.0 mL</td>
<td>=</td>
<td>ranging 15-30 min.</td>
<td>=</td>
<td>=</td>
</tr>
<tr>
<td>Azospermic baker’s (3/18)</td>
<td>0×10^6 million/ml</td>
<td>0</td>
<td>0</td>
<td>1.4 mL</td>
<td>=</td>
<td>=</td>
<td>=</td>
<td>watery</td>
</tr>
<tr>
<td>(10) Fertile control group</td>
<td>ranging 44×10^6-150×10^6</td>
<td>58-88</td>
<td>3-4</td>
<td>2.4-4.5 mL</td>
<td>=</td>
<td>=</td>
<td>=</td>
<td>normal</td>
</tr>
</tbody>
</table>
Discussion

The results clarify association of testicular scrotal hyperthermia with infertile baker's according to routine semen analysis. WHO, (2000).

A combination of varicocele with hyperthermia had been present in pathogenesis of spermatogenic failure in men with varicocele is largely unknown. One suggestion is that failure is due to increased temperature, Templeton et al., (1990); Comhaire, (1991).

However, pathophysiology of varicocele to increased blood flow causing an elevated intratesticular temperature, that's insult semen standard parameters to produce infertility men, as it was emerged in this study Pryor & Howard (1987).

Results show a large participate with Ei-Segini et al., (2002). That's referred to important sperm functions are impaired in patients with varicocele.

Also our results agreement with Esfandiar, et al., (2002), and their published association data with sperm motion characteristics and the effects of elevated temperature, that may lead to product of reactive oxygen species (ROS) in semen which act to reduce the ability of sperm motility and motion character.

Hence, we want to refer that harvested results agree with Karaca, A. et al., (2002). And their consideration studies, that investigate a high temperature might decrease male fertility by decreasing seminal plasma and intracellular ion concentration (especially Na\(^+\), Ca, Cl\(^-\)) during heat stress (HS).

Search, results study also showing that ages of baker's present as an effective factor to altered oligospermic, asthenospermic and oligoasthenospermic baker's to azospermic men. So as the tall-factor of baker's which is divided in two group; short-term and long-term, and their direct expose to great hole fire and high temperature of bakershop proceed a harmful action on the scrotal testicular region study show that long-term baker for long period exposing (years), appear to have had a persistent impairment of semen quality, because of long standing infron of fire comparing with sahort-term baker's.

Therefore, infertile prospect study suggest that high temperature play as predispose factor to introduce, varicocele, subvaricocele, temporary varicocele, reactive oxygen species (ROS), heat shock protein (HSP), heat stress (HS) and free radicals production.

Conclusions found collectively all of these causes may sharing each other in some percent to give impair sperm yield an infertile men lastly. And based on, evaluation of clinical and laboratory findings; baker's should avoided both direct face of fire and high temperature exposing inside bakershop through the use of cold van that's act directly on scrotal region especially in Summer season and dress special protective cloth around the scrotal baker's region.

References


