Cold Storage of Testicular Cat Sperm Maintains Membrane and DNA Integrity within 24 Hour

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Introduction

In addition to ejaculated and epididymal spermatozoa, testicular sperm are potential alternative genetic materials subjected to produce future offspring (1). The success in harvesting of good quality germplasm depends on several factors. In wild life species habitat in distance area, storage time of reproductive organs after post-mortem is considered as an important factor affecting gamete quality. Wild animal species are commonly found unexpectedly died in field locations. This study aimed to investigate effects of storage time and temperature on extracted testicular sperm quality of the domestic cat as a model for wild felids.

Materials and Methods

Testes were collected from nine adult male cats after a routine castration at Small Animal Hospital, Chulalongkorn University, Bangkok, Thailand. Pair of testes from each cat was equally cut into four pieces. Three randomly selected pieces were classified into three groups: fresh (Group I; control), stored at 4°C for 24 h (Group II) and stored at room temperature for 24 h (Group III). Each selected testes pieces were equally cut into small pieces and evaluated for sperm quality; membrane integrity (double stained with SYBR-14/EthD) and DNA integrity (stained with acridine orange) after storage at each temperature and time point. Data were analyzed using a MIXED procedure. $P < 0.05$ was considered as statistical difference.

Results and Discussion

Percentage of testicular sperm with intact membrane decreased when stored at room temperature for 24 hr compared to fresh sample ($p<0.05$). Sperm DNA integrity was affected by both storage time and temperature compared to the controls (Table 1). Cooling of cat testicular tissue at 4°C after castration or death could preserve sperm quality within 24 hr. The results are in accordance with the study in rat which the autolytic change of testicular tissues was observed at 12 and 24 hr after postmortem in room temperature (2).

<table>
<thead>
<tr>
<th>Gr</th>
<th>Storage time (h)</th>
<th>Temp (°C)</th>
<th>Intact membrane (%)</th>
<th>Intact DNA (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>0</td>
<td>RT</td>
<td>87.9 ±7\textsuperscript{a}</td>
<td>34.9±16.2\textsuperscript{a}</td>
</tr>
<tr>
<td>II</td>
<td>24</td>
<td>4</td>
<td>78.2 ±12.2\textsuperscript{a,b}</td>
<td>17.8±16\textsuperscript{b}</td>
</tr>
<tr>
<td>III</td>
<td>24</td>
<td>RT</td>
<td>59.5 ±30.5\textsuperscript{b}</td>
<td>16.8± 9.5\textsuperscript{b}</td>
</tr>
</tbody>
</table>

\textsuperscript{a,b} Different letters indicate statistical difference of data in same column ($p<0.05$).

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References