ABSTRACT

Cancer patients are now expected to live longer due to improved treatment modalities. This situation has directed attention towards quality of life issues such as fertility problems associated with cancer. Infertility associated with malignant disease was considered in the past to be mainly a side effect of the drugs and irradiation used during the course of treatment. However, this view is rapidly changing due to strong evidence that cancer patients present with suboptimal semen quality even prior to the initiation of chemotherapy/radiotherapy. In cancer patients, the quality of the neat specimen prior to freezing could not be considered as a predictor for cryopreservation tolerance. Nevertheless, the presence of suboptimal cryosurvival rates in these patients allows future fecundity in an assisted reproduction setting. Therefore, all cancer patients should be offered the opportunity to cryopreserve their semen specimens regardless of the quality as an option for fertility preservation.

INTRODUCTION

Correlation of sperm cryosurvival rates with pre-freeze motility in cancer patients.

Tamer M. Said, M.D., Sergio Tellez, M.D., and Alfonso P. Del Valle, M.D., F.R.C.S (C)


RESULTS

Post-Thaw Assessment

After a minimum freezing period of 24 hours, a vial containing a proportionate volume from each specimen was thawed by plunging in a 37°C water bath for 4 minutes and assessed for concentration and motility. As an internal quality control measure, the post-thaw parameters were also compared against the initial pre-freeze data. A significant correlation between initial pre-freeze motility and cryosurvival rate compared to fertile donors (47.3 ± 14.5 vs. 60.6 ± 8.3, p<0.0001 and 43.1 ± 17.9 vs. 59.5 ± 10.1, p<0.0001, respectively). In the cancer patient group, there was no correlation between pre-freeze motility and cryosurvival rate (r=0.03, p=0.66).

Statistical Analysis

Unpaired t-test was used to compare differences between groups. All hypothesis testing was 2-tailed and p<0.05 was considered statistically significant. Pearson correlation coefficients were used to study relationship between parameters. All calculations were performed using Graphpad Software version 3.00 (San Diego, CA).

MATERIALS AND METHODS

Seventy semen specimens were collected from 89 patients with various diagnoses. Thirty-nine patients had systemic malignancy (leukemia/lymphoma). Healthy proven fertile donors (n=20) were included as controls. All sperm assessments were made according to the WHO guidelines (4th edition, 1999).

Correlation of Sperm Cryosurvival Rates with Pre-Freeze Motility in Cancer Patients

Results of sperm concentration, pre-freeze motility and cryosurvival rates in cancer patients and fertile donors.

<table>
<thead>
<tr>
<th>Study Group</th>
<th>Specimens (n)</th>
<th>Concentration (Million/mL)</th>
<th>Pre-Freeze Motility (%)</th>
<th>Cryosurvival Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer Patients</td>
<td>177</td>
<td>48.2 ± 4.2</td>
<td>47.3 ± 14.5</td>
<td>43.1 ± 17.9</td>
</tr>
<tr>
<td>Fertile Donors</td>
<td>98</td>
<td>61.0 ± 1.7</td>
<td>60.6 ± 8.3</td>
<td>59.5 ± 10.1</td>
</tr>
</tbody>
</table>

Conclusions:

Cancer patients show suboptimal semen quality even before receiving chemotherapy or radiotherapy. In cancer patients, the quality of the neat specimen prior to freezing could not be considered as a predictor for cryopreservation tolerance. Nevertheless, the presence of significant cryosurvival rates in these patients allows future fecundity in an assisted reproduction setting. Therefore, all cancer patients should be offered the opportunity to cryopreserve their semen specimens regardless of the quality as an option for fertility preservation.