INTRODUCTION

Testicular cancer (TC) is the most common type of cancer among men at reproductive age and testicular cancer seminomas (TCS) represent one of the main types. It is strongly recommended that men diagnosed with TCS undergo sperm banking as the treatment by surgery, chemotherapy or radiotherapy, highly impairs male fertility. Sperm banking increases the probability of these patients to father a child in the future. However, many studies indicate that even prior to TC diagnosis and treatment, there is a reduction in the fertilizing ability of these men. Nonetheless, the underlying mechanisms are poorly understood. Recently, proteomics studies have been used as a valuable tool to explore how certain health conditions affect male reproductive potential, especially by evaluating the sperm and seminal plasma proteomes.

EXPERIMENTAL DESIGN

Inclusion criteria were as follows: 1) Control group – healthy fertile men who fathered a child in the last two years; 2) TCS group – patients diagnosed with TCS undergoing sperm banking before starting cancer therapy (Figure 1).

RESULTS

1. Expt semen volume all other sperm parameters were significantly lower in TCS group (Table 1).
2. The distribution of proteins in TCS and control group is shown in Figure 2.
3. Specific functions of the DEPs is shown in Table 2.
4. Western blot results showing the expression of 7 validated proteins is shown in Figure 3.
5. Mitochondrial complex proteins in TCS and control group is shown in Figure 4.

RESULTS cont.

Figure 1. Experimental design of the proposed study

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Control</th>
<th>TCS</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume (mL)</td>
<td>3.53 ± 0.35</td>
<td>3.33 ± 0.42</td>
<td>0.54</td>
</tr>
<tr>
<td>Sperm motility (%)</td>
<td>67.00 ± 3.00</td>
<td>54.00 ± 5.00</td>
<td>0.019</td>
</tr>
<tr>
<td>Sperm concentration (10^6/mL)</td>
<td>95.49 ± 7.79</td>
<td>46.72 ± 12.19</td>
<td>0.003</td>
</tr>
<tr>
<td>Total sperm count (10^6)</td>
<td>316.92 ± 45.41</td>
<td>136.11 ± 41.55</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Table 1. Semen parameters of fertile donors and patients with testicular cancer seminoma (TCS).

CONCLUSION

1. Currently there are no sperm biomarkers available for the clinical diagnosis and monitoring of fertility in men with TCS.
2. The study identified important alterations in key sperm proteins that may affect fertility in men with TCS.
3. HSP2, ATP1A4, UQCR2, and ACE may serve as potential sperm biomarkers and help in the early diagnosis of TCS and fertility in a non-invasive manner.

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