Circulating Tumor Cells in Head and Neck Squamous Cell Carcinoma: Evaluation of a Novel Method

INTRODUCTION

Circulating Tumor Cells (CTCs) are tumor cells that detach from their primary site and are found in peripheral blood. The presence of CTCs is associated with shorter overall and disease-free survival in patients with metastatic carcinoma. The basis principle for detecting CTCs is that epithelial carcinoma cells contain unique markers not found on normal blood cells.

The CellSearch system is a semi-automated test that captures, detects, and quantifies CTCs. It is validated for metastatic breast, prostate, and cervical cancer. The number of CTCs detected is an independent predictor of progression-free and overall survival. EpCAM and cytokeratins 18 and 19 are the cellular markers targeted by this system.

Multiple studies demonstrate that CTCs are detectible in HNSCC from various subsites (Table 1). Recent data suggests that CTC levels correlate with disease-free survival in HNSCC. There are no published reports of the CellSearch system being used in patients with HNSCC.

Purpose:

To determine if CTCs are identifiable in patients with metastatic HNSCC using the standardized CellSearch system.

MATERIALS & METHODS

• Adult patients with advanced HNSCC treated at WVU hospitals/clinics
• Despite testing a population with advanced disease, the system failed to detect a CTC in a clinical sample.

RESULTS

• 0 CTCs found in negative control
• Positive enrichment assay in which the system is searching for a "needle in a haystack"
• Possible selection bias assuming that CTCs contain the markers the system is looking for (EpCAM, CK)
• Small sample size

DISCUSSION

• The significance of CTCs in HNSCC remains uncertain at this time.

CONCLUSIONS

• Positive Controls-2 separate pure HNSCC cell lines were used to spike the sample. Therefore, this system is not a reliable technique for identifying CTCs in HNSCC.

REFERENCE


Table 1. Summary of existing evidence on CTCs in HNSCC

<table>
<thead>
<tr>
<th>Subsite</th>
<th>Year of Study</th>
<th>CTC Detection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral cavity</td>
<td>2004</td>
<td>80%</td>
</tr>
<tr>
<td>Glottis</td>
<td>2003</td>
<td>68%</td>
</tr>
<tr>
<td>Hypopharynx</td>
<td>2006</td>
<td>52%</td>
</tr>
<tr>
<td>Maxilla</td>
<td>2003</td>
<td>8%</td>
</tr>
<tr>
<td>Parotid</td>
<td>2004</td>
<td>35%</td>
</tr>
</tbody>
</table>

Table 2. Primary tumor sub site results for all patients.

<table>
<thead>
<tr>
<th>Path stage</th>
<th>N</th>
</tr>
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<tbody>
<tr>
<td>I</td>
<td>5</td>
</tr>
<tr>
<td>II</td>
<td>10</td>
</tr>
<tr>
<td>III</td>
<td>15</td>
</tr>
<tr>
<td>IV</td>
<td>14</td>
</tr>
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Table 3. TMA staining results for all patients.

REFERENCES


