SCALP COOLING IN CONJUNCTION WITH CHEMOTHERAPY
Consecutive results during a two year period using the Paxman Hair Loss Prevention System Aug 2001 - 2003
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Qualitative aspects of treatment and treatment outcome

Scalp cooling offers patients a possibility to maintain their physical appearance during chemotherapy which according to our experience is highly important for patient compliance. The majority of our successful patients have witnessed that the fact that they have been able to keep their hair during the treatment has allowed them to distance themselves from their disease in between treatments. Furthermore, the vast majority of our patients have expressed that they would elect to use scalp cooling again, should they need to go through a new treatment cycle.

The most common reported side effect of scalp cooling is a feeling of being cold. Patients feel very cold for the first ten minutes but normally adapt to the situation and then it becomes bearable for the rest of the treatment. In our department we keep patients warm with the help of blankets and warm drinks.

Patient quotes

"It was a cold experience for the first ten minutes, that’s the worst part"

"It means a lot to one’s self-esteem to keep one’s hair"

"It’s a long time to sit with the cap but it wasn’t particularly cold after the first ten minutes"

"One looks ill if one doesn’t have any hair"

"It’s a terrible to lose one’s hair" (One of the patients who lost much hair)

"Time doesn’t really feel long, one reads, dozes and sleeps for a while, it’s worth it"

Scalp Cooling protocol

The scalp cooling protocol using a Paxman PSC1 scalp cooler entails the cooling of the scalp to a temperature of approximately 17°C (data from previous study) by the use of circulating cooler medium in a tight cap. Previous studies have shown that at or below 22°C cell metabolism and blood flow is lowered to a level where minimum uptake of cytostatics take place (Bülow et al, Denmark, 1985). Careful attention is consequently required for the duration of the treatment.

The cooling time is dictated by the life-span of the pharmacological agents used. In general, a 30 minute period of pre-infusion cooling is employed to ensure minimum metabolic activity in the hair follicles when chemotherapy starts. The cap is then worn throughout the infusion period and for a variable time afterwards dependent upon drug regime being administered. All patients in this investigation had their hair wet prior to treatment to ensure a minimum of air insulation.

Drug Regime

<table>
<thead>
<tr>
<th>Drug Regime</th>
<th>No. of patients</th>
<th>0 = No hair loss</th>
<th>1 = Minor hair loss</th>
<th>2 = Substantial hair loss</th>
<th>3 = Total hair loss</th>
<th>4 = Success Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEC (Epirubicin) 60mg/m²</td>
<td>40</td>
<td>26</td>
<td>5</td>
<td>9</td>
<td>78%</td>
<td></td>
</tr>
<tr>
<td>Epinubicin 90mg/m²</td>
<td>8</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>Taxol 175mg/m²</td>
<td>12</td>
<td>6</td>
<td>1</td>
<td>5</td>
<td>58%</td>
<td></td>
</tr>
<tr>
<td>Taxol (Weekly) 80mg/m²</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td>Taxotere 100mg/m²</td>
<td>35</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>80%</td>
<td></td>
</tr>
<tr>
<td>Taxotere (Weekly) 35mg/m²</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>N/R</td>
<td></td>
</tr>
</tbody>
</table>

Overall it should be concluded that treatment with scalp cooling has been a success. In particular, we have had very favourable results with patients treated with epirubicin 60mg/m². This is also the largest group of patients undergoing scalp cooling. For patients receiving epirubicin in a concentration of 90mg/m² the success rate is 50%. For patients receiving Taxol 80mg/m² and Taxotere 90mg/m² the results have generally been positive. However, patients receiving Taxol 175mg/m² and Taxotere 100mg/m² have all required a wig following substantial to total hair loss. Out of the few patients who have been treated with CPT 11 only those receiving 180mg/m² have been able to keep their hair. However, the experience is based on a very small number of patients. The department has chosen to prioritise the Paxman system as we have registered a very high degree of patient satisfaction.

We have noted an increased degree of success as our experience with the system has grown and as the fit of the caps has been improved. In general the Paxman system is easy and safe to handle. The availability of single units has offered a considerable advantage as department space is limited. The majority of our patients have expressed that the first ten minutes of the treatment bring discomfort because of the cold. We try to avoid general signs of cold with the help of blankets and warm drinks. A few patients develop headaches which we treat with Paracetamol and some patients have found the prolonged treatment time difficult to manage. In spite of these side effects the majority of our patients have expressed that they would go through the treatment again, should they need a new treatment cycle.

The question is how to improve on the results with Taxotere and Taxol. Further lowering of the temperature will not help and it is difficult to prolong the post-infusion cooling times as patients find the long time distressing. At our department we have considered to discontinue offering scalp cooling to patients receiving Taxol 175mg/m² and Taxotere 100mg/m². Further and more intensive research is needed to investigate the individual cooling times for the different cytostatics and their dosages.

Discussion and conclusions

* All patients who have received Taxol/Taxotere 175mg/m² required a wig
* ** Not relevant; no statistical significance