

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 find it bearable for the rest of the treatment. In our department we keep patients warm with the help of blankets and warm drinks.

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 (Bulow 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.

Patient Gender and Disease Classification

All patients treated with scalp cooling in conjunction with chemotherapy during a two-year period have been evaluated regarding treatment efficacy with scalp cooling after the conclusion of chemotherapy.

In total 66 patients have been treated, 64 females and 2 males.

The most predominant diagnosis were:

Breast cancer - 54 patients

Ovarian cancer - 6 patients

Other cancers - 6 patients

Evaluation criteria

The patients were evaluated regarding scalp cooling efficacy by visual inspection of the degree of hair loss at the last appointment following the termination of chemotherapy:

0 = No hair loss 1 = Minor hair loss without wig requirement 2 = Substantial to total hair loss requiring wig substitute



Pre-chemotherapy



Pre-chemotherapy



Pre-chemotherapy



Pre-chemotherapy



Pre-chemotherapy



Pre-chemotherapy



Post Scalp Cooling



Post Scalp Cooling



Post Scalp Cooling



Post Scalp Cooling



Post Scalp Cooling



Post Scalp Cooling

Patient quotes

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

"I would not have managed without the treatment, I would do it again"

"When you are allowed to keep your hair you can decide for yourself who should know that you're ill. If you have a wig people can see, people ask funny questions. I do not want other peoples' pity."

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

"I did not feel like other ill people, that meant a lot when I went for radiotherapy"

"It was wonderful not to have to look ill"

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

"During the first ten minutes it was like all my strength was taken from me"

"The smell of the cap is terrible"

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

"It is 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"

Results

Drug Regime	Dosage	Pre-infusion Cooling (Minutes)	Post-infusion Cooling (Hours)	Return Coolant Temperature (°C)
FEC	(Epirubicin) 60mg/m ²	30	1.5	-4 - -5
Epirubicin	90mg/m ²	30	2	-4 - -5
Taxol	175mg/m ²	30	2	-4 - -5
Taxol (Weekly)	80mg/m ²	30	1	-4 - -5
Taxotere	100mg/m ²	30	1.5	-4 - -5
Taxotere (Weekly)	35mg/m ²	30	1	-4 - -5
CPT 11	350mg/m ²	30	2	-4 - -5
CPT 11	180mg/m ²	30	1.5	-4 - -5

Results

Drug Regime	No. of patients	0 = No-minimal hair loss	1 = Minor hair loss	2 = Substantial - total hair loss	Success Rate
Epi. 60 mg/m ²	40	26	5	9	78%
Epi. 90 mg/m ²	8	3	1	4	50%
Taxol/Taxotere*	12	6	1	5	58%
CPT	4	3		1	N/R**
Doxorubicin 60mg/m ²	2			2	N/R**

Discussion and conclusions

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 doses.

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