Using a new controlled thermotherapy (Hilotherapy®) during chemotherapy prevents chemotherapy - induced Polyneuropathy

Schaper T.[1,2], Rezai M. [3], Darsow M.[1]

[1] Luisenkrankenhaus Düsseldorf, [2] Internationale Senologie Initiative ISI e.V., [3] Europäisches Brustzentrum Dr. Rezai, Düsseldorf

Introduction:

Chemotherapy-induced peripheral neuropathy (CIPN) is an adverse effect of many commonly used chemotherapeutic agents (cisplatin, oxaliplatin, more rarely carboplatin, vinca alkaloids, especially vincristine, more rarely also vinblastine and vinorelbine, 5-fluoropyrimides (5-FU, capecitabine). CIPN in breast cancer is often caused by taxane-based regimen (Paclitaxel, nab-Paclitaxel, Docetaxel) carboplatin, eribulin and vinorelbine.

CIPN occurs in 30-40% of patients receiving chemotherapy but can be seen to some degree in up to 70% of patients (1-3).

The peripheral neuropathy (PN) induced by taxanes may persist for several years in about 30% of patients and is negatively accociated with quality of life (4). Often the CIPN results in dose delay, dose reduction or treatment discontinuation.

In our study we found that the prophylactic hand / feet cooling using a new computer - controlled thermotherapy device (Hilotherapy®) prevented the chemotherapy-induced-peripheral neuropathy (CIPN) in breast cancer patients.

Regime	Grade of toxicity	Number of patients
E (150mg/m$^{2)}$ -T (225mg/m^{2}) - C (2000mg/m$^{2)}$ at last therapy	3	1
Carb (AUC 6)	2	1
Paclitaxel + Cb	2	2
4x EC q3w + 12x Paclitaxel q1w	2	5

Fig. 2: Therapeutic regimen and grade of toxicities

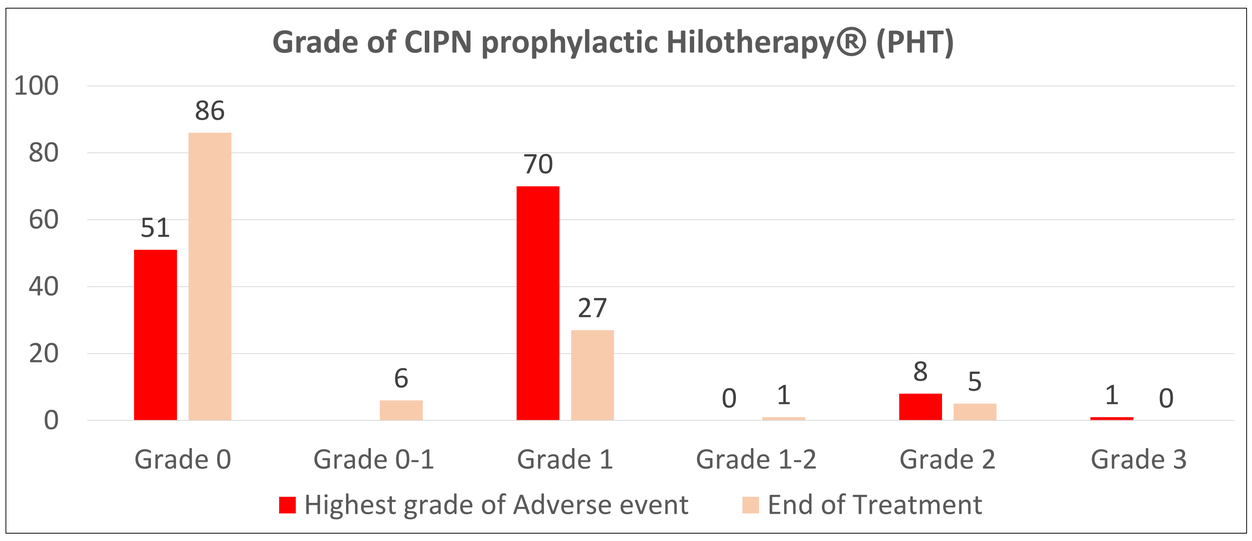

Fig. 3: Grade of CIPN during chemotherapy treatment and PHT

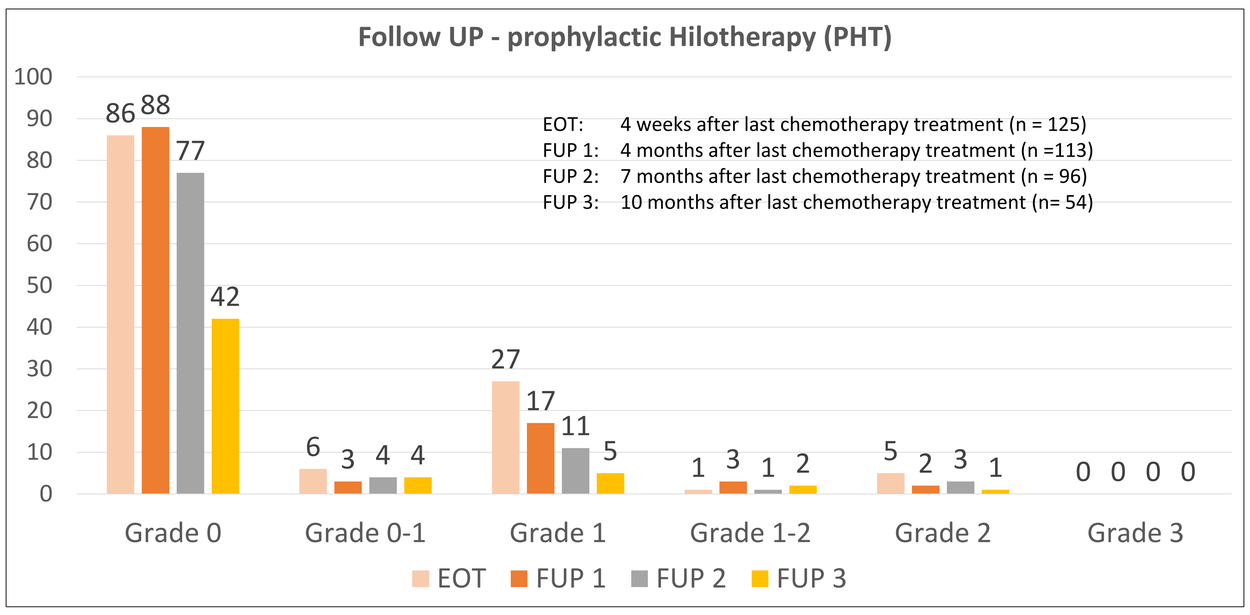

Fig. 4: FollowUP of toxicities after chemotherapy treatment with PHT

Patients and Method

130 breast cancer patients treated with taxane-based therapeutic regimen used prophylactic Hilotherapy® (PHT) to cool hands and feet during chemotherapy infusion. The Hilotherm device is a new physical thermotherapy, equiped with hand and foot cuffs to allow a constant cooling in a localized and targeted manner (Fig. 1 a&b).

Continous cooling of hands and feet was performed 30 minutes before to 60 minutes after completing drug infusion with a temperature of 10-12°C.

CIPN symptoms were evaluated after each treatment cycle using the common terminology criteria for adverse events (CTCAE). The sustainability of the impact was assessed by long-term datas (Follow Up patient contact every 3 months) based of questionnaires results on telephone.

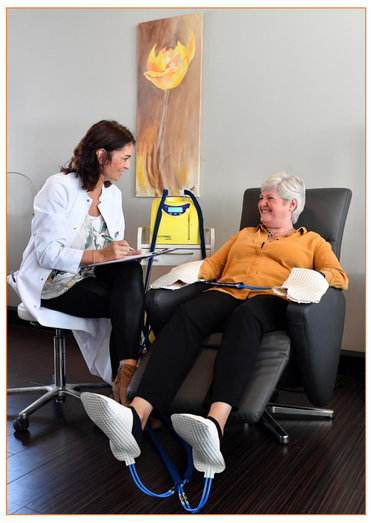

Fig. 1a: Patient during prophylactic cooling

Fig. 1b: Cooling device with hand and feet cuffs

Results: Prophylactic Hilotherapy (PHT)

130 patients have finished their taxane based chemotherapy treatments with prophylactic hand-feet cooling using Hilotherapy (PHT) **(Fig. 1a&b).**

121 patients (93%) developed none or mild symptoms of CIPN (grade 0-1). 8 patients (6,2%) reported grade 2 toxicity of CIPN, 1 patient grade 3 (0,8%) **(Fig. 3).** Grade 2 toxicity of CIPN occurred in treatment regimens with paclitaxel (80mg/m^2) weekly combined with or without Carbolplatin (AUC 2; n = 7) and with Carboplatin mono (AUC 6; n = 1) **(Fig. 2&3).** Grade 3 toxicity has been observed with dose dense chemotherapy treatment E -T- C (n = 1) **(Fig. 2&3).**

The symptoms of CIPN were reversible. Four weeks after the last chemotherapy treatment (EOT), 5 patients (4 %) still reported grade 2 toxicity of CIPN, none of them suffered from grade 3 **(Fig 4)**. Another 3 months later (FollowUP 1) 2 patients (1,8%) only reported symptoms of grade 2 toxicity. Long-term Follow Up datas confirm the sustainability of the results and a continuous improvement of symptoms **(Fig. 4&5).**

4, 7 and 10 months (Follow UP 1-3) after the last chemotherapy treatment, 97% - 98% of all patients didn´t show any limiting symptoms of CIPN (grade 0-1 toxicity) **(Fig. 5).**

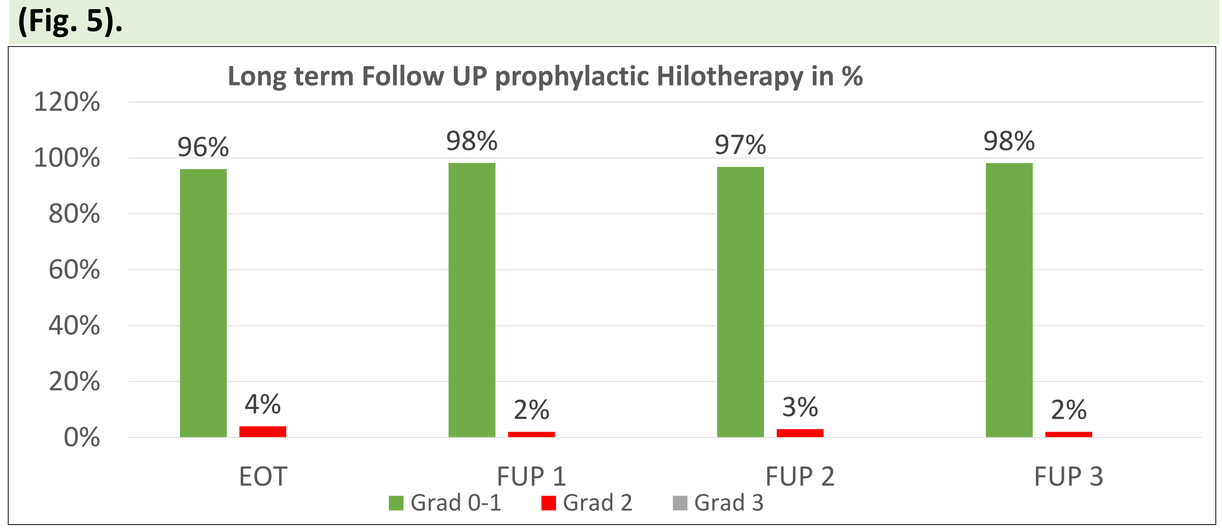

Fig. 5: Long term FollowUP of toxicities in % after chemotherapy treatment with PHT

EOT:4 weeks after last chemotherapy treatment (n = 125)
FUP 1: 4 months after last chemotherapy treatment (n =113)
FUP 2: 7 months after last chemotherapy treatment (n = 96)
FUP 3: 10 months after last chemotherapy treatment (n= 54)

Conclusions and discussion

The prophylactic hand-foot cooling with a new thermotherapy treatment (Hilotherapy®) prevented the development of limiting CIPN Symptoms (> grade 1) in 93% of all patients receiving a taxane based chemotherapy regimen. 7% of the patients (n=9) developed reversible toxicities grade 2/3. The sustainability of the results was confirmed by the long term follow up datas: 4-10 months (FUP 1 - 3) after completing the chemotherapy treatment 97% - 98% of the patients are without any limiting symptoms (grade 0-1) of CIPN.

We haven´t had any dose modifications or treatment interruptions due to CIPN toxicities. Even patients with pre-existing symptoms of neuropathy (e.g. recurrence or concomitant disease) experienced no worsening of symptoms and were able to receive the taxane based chemotherapy treatment without dose reduction.

CIPN significantly affects the quality of life of patients with cancer and cancer survivors.

Due to the modern, targeted and individualized therapeutic options, there is a significant improvement in the long-term prognosis and overall survival for many oncological patients. Therefore maintaining quality of life and avoiding long term complications such as CIPN is becoming more important.

ID 984: 34. DEUTSCHER KEBSKONGRESS 2020, 19. – 22. Febr. 2020. Presenting author: Dr. rer. nat Trudi Schaper; schaper@luisenkrankenhaus.de. We thank Hilotherm providing the equipment for conducting the study.

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