Safety and efficacy of cryotherapy in the prevention and treatment of chemotherapy-induced peripheral neuropathy in breast cancer patients

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INTRODUCTION

Chemotherapy-induced peripheral neuropathy (CIPN) is a serious clinical problem that can be caused by some cytotoxic agents used in breast cancer (BC) treatment, most commonly seen following taxane-based therapy[1,2]. It may result in dose reduction; early treatment discontinuation and it could negatively impact the patient's quality of life. In most cases CIPN is manifested in a symmetric distal "glove-stocking" distribution[1]. Several strategies have been studied for CIPN prevention and treatment, but, still, there is no standard recommendation, options are limited and results unsatisfactory [1]. Cryotherapy is a technique that consists of reducing the blood flow in a certain area of the body by cold temperatures, in order to limit the cytotoxic reach. A few studies have been conducted to analyze the safety and efficacy of this strategy in CIPN prevention and treatment, and results are controversial [3,4,5]. More data is needed to clarify cryotherapy's role in this clinical context.

MATERIALS & METHODS

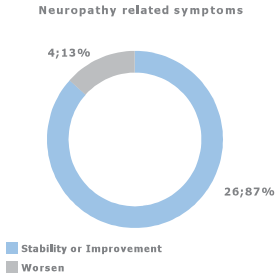
This is a retrospective analysis of 40 BC patients treated at a single Brazilian institution between December 2019 and June 2022, aiming at efficacy and safety of cryotherapy in the prevention and treatment of CIPN. Cryotherapy was administered by the Hilotherm Clinic Chemo HT02 device (Hilotherm GmbH - Oberwil bei Zug, Switzerland [6]). The procedure consisted of patients using glove and sock-like devices on hands and feet throughout the chemotherapy infusion. The devices were pre-cooled to 10ºC and then put on patients 30 minutes before starting, till one hour after the end of chemotherapy infusion. A questionnaire, as proposed by Leonard et al [7], was administered to patients every cycle to assess the development and severity of CIPN symptoms. Statistical analyses were performed by using a Cox regression model.

OBJECTIVES

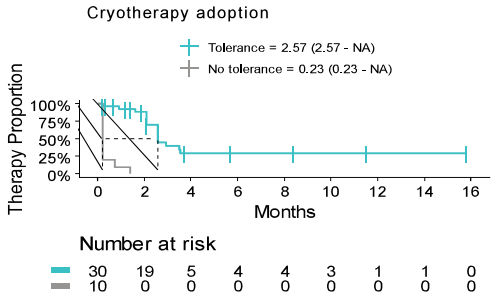
To analyze the efficacy and safety of cryotherapy in the prevention and treatment of CIPN in breast cancer patients treated with chemotherapy in a single institution in Brazil.

RESULTS

Of the 40 patients analyzed, 33 (83.5%) underwent a taxane-based regimen. The median number of cryotherapy sessions was three (ranging from 1 to 12), and, when excluded patients who underwent only one session of cryotherapy, the median was 4 (range 2 to 12). 75% of the 40 patients underwent cryotherapy in all chemotherapy sessions or were still receiving chemo with cryotherapy by the time of our analysis. 80% of those who left treatment did so after the first session (HR 40.44 (CI95: 8.34 – 196.1; p<0.0001). CIPN was stable or better than the baseline status for 26 (87%) of the 30 patients that underwent more than 1 session of cryotherapy; only 1 (25%) of the four patients who developed CIPN worse than the baseline status had grade 2 symptoms.



Anatomic Region	Symptom	Worsen	Stability or Improvement
Inferior Limbs	Tingling	10,00%	90,00%
	Numbness	16,67%	83,33%
	Difficulty of perceiving surfaces	10,00%	90,00%
	Difficulty feeling hot things	6,67%	93,33%
	Difficulty feeling cold things	6,67%	93,33%
	Exacerbated feeling to touch	6,67%	93,33%
	Burning pain or discomfort without the cold	16,67%	83,33%
	Burning pain or discomfort from cold	16,67%	83,33%
	Heavy legs	20,00%	80,00%
Superiors Limbs	Tingling	10,00%	90,00%
	Numbness	20,00%	80,00%
	Difficulty of perceiving surfaces	6,67%	93,33%
	Difficulty feeling hot things	6,67%	93,33%
	Difficulty feeling cold things	6,67%	93,33%
	Exacerbated feeling to touch	3,33%	96,67%
	Burning pain or discomfort without the cold	6,67%	93,33%
	Burning pain or discomfort from cold	10,00%	90,00%
	Difficulty to identify objects	3,33%	96,67%
	Involuntary movements	13,33%	86,67%
Orofacial	Jaw pain	3,33%	96,67%
	Droopy eyelids	6,67%	93,33%
	Discomfort in the throat	6,67%	93,33%
	Earache	0,00%	100,00%
	Tingling in the mouth	3,33%	96,67%
	Difficulty to speak	10,00%	90,00%
	Burning or distress in the eye	6,67%	93,33%
	Loss of one of the views	0,00%	100,00%
	Sense of shock or back pain	13,33%	86,67%
	Breathing difficulty	6,67%	93,33%



CONCLUSIONS

Cryotherapy is a safe and tolerable strategy that can be used during chemotherapy for breast cancer. Our data suggests that this is an efficient approach to prevent and treat CIPN, but the retrospective nature of the study and the small sample size must be considered when interpreting the results. Finally, strategies must be developed to further improve adherence and tolerability, and prospective randomized trials are needed to confirm the efficacy of cryotherapy in this context.

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