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Abstract

Background: Weight changes during chemotherapy in women with cancer breast cancer are commonly suggested by the medical literature. The association between gain weight and chemotherapy has shown a general trend of decreasing magnitude in last years. The consequence on disease-free survival and self-esteem in patients with breast cancer after chemotherapy highlights the importance of research on the topic. This study aims to evaluate weight changes in patients with non-metastatic breast cancer undergoing adjuvant and/or neoadjuvant chemotherapy in a oncology in southern Brazil.Methods: Data from 122 medical records center of high complexity oncology in Southern Brazil for patients diagnosed with non-metastatic malignant breast cancer and undergoing chemotherapy for one year. Statistical analysis was performed by SPSS v.20.0.

Index terms— adjuvant therapy; neoadjuvant therapy; body weight; body mass index; breast cancer.

1 I.

Background reast cancer is the second most frequently diagnosed malignancy, it is also the leading cause of cancer death in women. cancer patients early-stage breast cancer undergo primary breast and lymph node surgery regions, with or without radiotherapy. Afterwards, adjuvant systemic therapy may be indicated. However, some patients with earlystage invasive breast cancer may be treated with neoadjuvant therapy first. Chemotherapy is associated with effects side effects, including nausea, vomiting, diarrhea, hair loss, fatigue, mucositis, cytopenia, ovarian failure, cardiac toxicity, and emotional and psychiatric. Among the known side effects of chemotherapy, the weight change and its association with a poor prognosis of the disease (1)(2)(3) Weight change in breast cancer patients can influence the quality of life, self-esteem and development of new comorbidities. Studies report greater risk of disease recurrence and worse prognosis when performing the treatment (1)(2)(3)(4)(5)(6). One meta-analysis showed that a weight gain of 10% or more after the diagnosis of Breast cancer is associated with a higher mortality rate (4). On the other hand, there are recent studies showing no significant changes in the weight of patients with breast cancer undergoing chemotherapy (3,5,6). Based on these data, studies have also demonstrated the importance of nutritional monitoring and exercise during the chemotherapy treatment (7)(8)(9).

A meta-analysis showed that weight gain during chemotherapy was greater in articles published up to the 2000s and that there is a trend of weight gain be decreasing over the years (1). In line with this idea, a meta-analysis Canadian added that weight gain is more associated with chemotherapy adjuvant, with long-term treatments and increased in pre menopause (10). In this context, the literature suggests that the duration of chemotherapy can also be a factor for weight gain (11,12) and also shows that pre-menopausal patients show greater weight gain than post-menopausal patients (6,13). The association between weight gain and chemotherapy treatment has shown general trend of decreasing magnitude in recent years. It is known that changes in weight change may be unfavorable in body composition. the consequence disease-free survival and self-esteem, associated with the emergence of psychiatric disorders in patients with breast cancer after chemotherapy evidences the importance of research on the subject. Therefore, this study aims to evaluate changes in weight and BMI (Body Mass Index) in breast cancer patients non-metastatic patients undergoing adjuvant and/or neoadjuvant chemotherapy in a of oncology in southern Brazil.

2 II.

3 Objectives a) Primary Purpose

To V.

Outcome 122 female patients with non-metastatic breast cancer and mean age 53.48 ± 12.23 years were followed up for one year. 44.3% of patients were postmenopausal. Regarding the comorbidities presented, the following stand out: Systemic Arterial Hypertension (34.4%), Hypothyroidism (10.7%), Dyslipidemia (6.6%), Diabetes (3.8%), Deep Vein Thrombosis (2.5%), Rheumatologic Disorders (3.3%), Cardiac (2.5%). 1.6% of the patients maintained their alcohol consumption and 12.3% maintained the smoking during treatment. In the studied sample, 3.3% had generalized anxiety, 12.3% depression, and other psychiatric disorders in follow-up were found in 4.1% of patients. During this period, 7.4% of the patients developed COVID 19. Table **??** shows the characteristics of patients.

Regarding the type of breast cancer, 90.2% of the patients have breast cancer invasive ductal carcinoma, while 3.3 had invasive lobular carcinoma and 3.3% the others types. 70.5% of the patients had the positive hormone receptor subtype and 35.2% Her-2 positive. The stages of breast cancer were also analyzed, with the majority being of stage IIB patients (35.2%). Table 2 shows the characteristics of cancers of breast.

As shown in table 3, in the analyzed sample, 51.6% performed neoadjuvant chemotherapy, 36.1% adjuvant chemotherapy and 12.3 underwent both types of chemotherapy. The chemotherapy time was less than or equal to 1 year for 77% of patients. In the annual follow-up, 9% had adverse reactions to chemotherapy, the majority being a mild reaction. It is known that the treatment of breast cancer it is multifactorial. In relation to other treatments associated with chemotherapy, 45.9% of patients underwent hormone therapy and 50% of patients underwent radiotherapy.

Patients were classified according to the BMI classification of the World Health Organization (WHO) before and after chemotherapy. You results are described in table 4. Most of the sample was pre chemotherapy with weight at the first visit before chemotherapy with a mean of 75.4 ±16.95kg; Weight at the last post-chemotherapy visit with a mean of 75.61 ±17.29 kg; Height had a mean of 160.39 ± 7.20. The BMI at the first consultation before the chemotherapy presented an average of 29.25±5.94; BMI at the last consultation showed an average of 29.32 ± 6.01. When statistically comparing by Student's T Test the weights and BMI before and after chemotherapy showed P=0.711 and P=0.774 respectively. A non-significant relationship was observed between the patients' baseline weight and postpartum weight. chemotherapy.

Regarding the BMI classification according to WHO, there was no significant change in the status between pre and post chemotherapy P=0.607. 67.3% remained in the eutrophic category. 54.5% remained in the obesity category I. 83.3% remained in the obesity category II. 57.1% remained in the obesity category III. 59.6% remained overweight. Variations in ranking during follow-up are represented in table 5.

4 VI.

5 Discussion

We evaluated pre-and post-chemotherapy weight changes among women with non-metastatic breast cancer. Most of the studied sample presented time of chemotherapy less than or equal to one year. The medical literature suggests that the duration of chemotherapy can be a factor for weight change, and long-term treatments duration have greater weight gain. (10). Furthermore, unlike the presented in our study, young and pre-menopausal women would have greater weight gain according to some previous research (10,11,14,15) Consistent with our results, a narrative review suggested that women with normal BMI at baseline were more likely to gain weight compared with overweight women (10). We demonstrated that eutrophic women had more chance of gaining weight than overweight patients after chemotherapy. 32.1% of patients in the eutrophic classification were overweight after chemotherapy and 22.7% of patients with Grade I Obesity had Grade II Obesity after chemotherapy, while 5.6% of patients with grade II obesity had Grade III obesity.

In the same context, other articles also demonstrated no significant weight change among patients with non-metastatic breast cancer before and after chemotherapy (3,6). Article in Saudi Arabia followed 228 women between 18-80 years of age with non-metastatic breast cancer and early-stage chemotherapy and did not obtain significant changes in weight (3). Likewise, a Korean survey evaluated 260 women with non-metastatic breast cancer and showed no change in significant weight (5). Furthermore, although weight gain still prevails as an effect postchemotherapy collateral, studies have shown a tendency for a decrease in weight change in women with breast cancer after chemotherapy over the years (1).

Some factors may have contributed to the nonweight gain of patients in our study: regular follow-up with a nutrition team, the time of chemotherapy and the type of chemotherapy performed. Studies show that the increase of taxanes in treatments has suggested less weight gain in more recent years (1). The group of patients in follow-up was also considered to have less previous comorbidities in relation to the reference studies, being another possible fator not to change weight. 51.6% of patients underwent neoadjuvant chemotherapy, it is known that studies on the association of neoadjuvant chemotherapy and changes in weight are still limited in the medical literature.

6 VII.

7 Conclusion

This study did not reveal significant weight changes after one year of adjuvant and/or neoadjuvant chemotherapy. Furthermore, most patients with breast cancer followed-up during the period did not change their BMI classification according to WHO. Since studies show a trend towards a reduction in Weight changes over the next few years in breast cancer patients are needed new studies, considering the different regional features.

8 Conflicts of interest None

9 Financial relationships None

		Inclusion and Exclusion Criteria: All patients who received chemotherapy participated in the study. neoadjuvant and/or adjuvant for breast cancer in March of 2020 until December 2021 with the diagnosis through anatomopathological analysis of neoplasia non-metastatic breast cancer, regardless of histological type with stages clinics from I to IIIC. In the inclusion criteria were considered: Being of the sex feminine; Be over 18 years of age; No neoplasm metastatic; Maintaining follow-up at medical consultation and nutrition during the study period. For this study, data were collected from 190 patients, the following were excluded: male patients, deaths, metastatic tumors; patients with loss of oncological follow-up and patients with incomplete data. Research Ethics Committee:
evaluate weight and BMI changes in non-invasive breast cancer patients undergoing adjuvant and/or neoadjuvant chemotherapy in the Center of High Complexity Oncology in Southern Brazil in the period from March 2020 to December 2021. b) Secondary Objectives a. Outline the epidemiological profile and the presence of other comorbidities in non-metastatic breast cancer patients undergoing adjuvant chemotherapy and or neoadjuvant treatment in the Center of High Complexity Oncology in Southern Brazil. b. To analyze whether there was a change in the WHO classification of the BMI of patients with non-metastatic breast cancer undergoing adjuvant chemotherapy and/or neoadjuvant in the Center of High Complexity Oncology in Southern Brazil.		
III.	Study Design	

[Note: Observational, Descriptive and Retrospective Study IV. Study Population and Methodology Population Studied: Data from 122 medical records at the Center of High Complexity Oncology in Southern Brazil of patients diagnosed with malignant neoplasm of the non-metastatic breast and submitted to neoadjuvant and/or adjuvant chemotherapy during March 2020 until December 2021. Methodology: The data were entered in the Excel program and later exported to the SPSS program v. 20.0 for statistical analysis. Categorical variables were described by frequencies and percentages. The normality of quantitative variables was verified by the Kolmogorov Smirnov test. Quantitative variables were described by the mean and the standard deviation. Mean weight and BMI were compared before and during the chemotherapy by Student's t test for paired samples. To associate the categories

2

Characteristics	Outcomes
Invasive Ductal Carcinoma	90,9% (110)
Invasive Lobular Carcinoma	3,3% (4)
Other Types of Carcinoma	3,3% (4)
Positive Hormone Receptor	70,5% (86)
Negative Hormone Receptor	29,5% (36)
HER 2 Positive	35,2% (43)
HER 2 Negative	64,8% (79)

Figure 2: Table 2 :

3

Characteristics	Outcomes
Chemotherapy Type	
Neoadjuvant	51,6% (63)
Adjuvant	36,1% (44)
Neoadjuvant + Adjuvant	12,3% (15)
Chemotherapy time:	
Less than or equal to one year	77,0% (94)
Major to one year	23,0% (28)
Presence of reaction to chemotherapy	9,0% (11)

Figure 3: Table 3 :

4

Classification	Outcomes
Pre-Chemotherapy	
Eutrophic	23,0% (28)
Grade I Obesity	18,0% (22)
Grade II Obesity	14,8% (18)
Grade III Obesity	5,7% (7)
Overweight	38,5% (47)
Pos-Chemotherapy	
Eutrophic	25,4% (31)
Grade I Obesity	16,4% (20)
Grade II Obesity	18,9% (23)
Grade III Obesity	4,1% (5)
Overweight	35,2% (43)

Figure 4: Table 4 :

5

Classification Pre-Chemotherapy	Classification Pos-Chemotherapy				
	Eutrophic	I Obesity	II Obesity	III Obesity	Overweight
Eutrophic	67,9%	0%	0%	0%	32,1%
I Obesity	0%	54,5%	22,7%	0%	22,7%
II Obesity	0%	5,6%	83,3%	5,6%	5,6%

Figure 5: Table 5 :

[Pre-Menopausal] , Pre-Menopausal . 55 p. 7.

[Pos-Menopausal Women] , *Pos-Menopausal Women* 44 (54) p. 3.

[Arterial Hypertension Systemic] , *Arterial Hypertension Systemic* 34 (42) p. 4.

[Diabetes] , *Diabetes* 9 (12) p. 8.

[Cardiological Comorbidities] , *Cardiological Comorbidities* 2 (3) p. 5.

[He et al. ()] 'Adjuvant chemotherapy associated lipid changes in breast cancer patients: A real-word retrospective analysis'. T He , C Wang , Q Tan , Z Wang , J Li , T Chen . *Medicine (Baltimore)* 2020. 99 (33) p. e21498.

[Jung et al. ()] 'Changes in weight, body composition, and physical activity among patients with breast cancer under adjuvant chemotherapy'. G H Jung , J H Kim , M S Chung . *Eur J Oncol Nurs* 2020. 44 p. 101680.

[Deep Vein Thrombosis] *Deep Vein Thrombosis*, 2 p. 5.

[Visovsky ()] 'Muscle strength, body composition, and physical activity in women receiving chemotherapy for breast cancer'. C Visovsky . *Integr Cancer Ther* 2006. 5 (3) p. .

[Lí?ka et al. ()] 'Physical Therapy as an Adjuvant Treatment for the Prevention and Treatment of Cancer'. D Lí?ka , B Stráska , M Pupi? . *Klin Onkol* 2020. 33 (2) p. .

[Demark-Wahnefried et al. ()] 'Reduced rates of metabolism and decreased physical activity in breast cancer patients receiving adjuvant chemotherapy'. W Demark-Wahnefried , V Hars , M R Conaway , K Havlin , B K Rimer , G Mcelveen . *Am J Clin Nutr* 1997. 65 (5) p. .

[Carayol et al. ()] 'Short-and long-term impact of adapted physical activity and diet counseling during adjuvant breast cancer therapy: the "APAD1" randomized controlled trial'. M Carayol , G Ninot , P Senesse , J P Bleuse , S Gourgou , H Sancho-Garnier . *BMC Cancer* 2019. 19 (1) p. 737.

[Table 1: Characteristics and previous comorbidities of the patients studied Characteristics and Previous comorbidities Outcomes *Table 1: Characteristics and previous comorbidities of the patients studied Characteristics and Previous comorbidities Outcomes Age*, 53.

[Van Den Berg et al. ()] 'Weight change during chemotherapy in breast cancer patients: a metaanalysis'. M M Van Den Berg , R M Winkels , J T De Kruif , H W Van Laarhoven , M Visser , J H De Vries . *BMC Cancer* 2017. 17 (1) p. 259.

[Han et al. ()] 'Weight changes after adjuvant treatment in Korean women with early breast cancer'. H S Han , K W Lee , J H Kim , S W Kim , I A Kim , D Y Oh . *Breast Cancer Res Treat* 2009. 114 (1) p. .

[Al-Hajeili et al. ()] 'Weight Changes in Women Receiving Chemotherapy for Non-Metastatic Breast Cancer in Saudi Arabia'. M Al-Hajeili , N Trabulsi , M A Makin , N Shibriq , R Alshelali , L Alghoraibi . *Cureus* 2021. 13 (1) p. e12961.

[Playdon et al. ()] 'Weight Gain After Breast Cancer Diagnosis and All-Cause Mortality: Systematic Review and Meta-Analysis'. M C Playdon , M B Bracken , T B Sanft , J A Ligibel , M Harrigan , M L Irwin . *J Natl Cancer Inst* 2015. 107 (12) p. 275.

[Mcinnes and Knobf ()] 'Weight gain and quality of life in women treated with adjuvant chemotherapy for early-stage breast cancer'. J A Mcinnes , M T Knobf . *Oncol Nurs Forum* 2001. 28 (4) p. .

[Makari-Judson et al. ()] 'Weight gain following breast cancer diagnosis: Implication and proposed mechanisms'. G Makari-Judson , B Braun , D J Jerry , W C Mertens . *World J Clin Oncol* 2014. 5 (3) p. .

[Vance et al. ()] 'Weight gain in breast cancer survivors: prevalence, pattern and health consequences'. V Vance , M Mourtzakis , L Mccargar , R Hanning . *Obes Rev* 2011. 12 (4) p. .

[Levine et al. ()] 'Weight gain with breast cancer adjuvant treatment'. E G Levine , J M Raczynski , J T Carpenter . *Cancer* 1991. 67 (7) p. .

[Nyrop et al. ()] 'Weight trajectories in women receiving systemic adjuvant therapy for breast cancer'. K A Nyrop , A M Deal , S S Shachar , J Park , S K Choi , J T Lee . *Breast Cancer Res Treat* 2020. 179 (3) p. .