



Exploring Taste Alterations in Women Undergoing Chemotherapy for Breast Cancer: A Pilot Study



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INTRODUCTION

Taste and smell alterations are symptoms frequently reported by patients undergoing chemotherapy; according to what is described in literature, the percentage of patients in treatment with chemotherapy with taste alterations ranges from 45% to 84%. While some of the side effects can be evaluated and managed effectively, others, such as dysgeusia, are generally less known and neglected because they are considered minor symptoms. On the other hand dysgeusia can cause anxiety, depression, and nutritional deficiencies, resulting in decreased appetite, weight loss, overall, a worsening of the patient's quality of life. In addition, it is important to emphasize that only through proper nutrient intake can adhere to therapeutic timing and reduce the occurrence of complications. Taste disturbances, although not a serious undesirable effect, deserve interest because of the important repercussions they can also have in cases of olfactory dysfunction, to which they are often linked. The aim of this study is to investigate the incidence, extent, and characteristics of any taste alterations in adult patients undergoing antineoplastic therapy. It will therefore investigate whether and to what extent dysgeusia occurs in patients referred to the Breast Unit of the Spedali Civili di Brescia, who have breast cancer and are candidates to start anti-neoplastic therapy

METHODS AND MATERIALS

Forty women of mean age 56 ± 10 years, from the O.U. Breast of the Spedali Civili di Brescia, suffering from breast cancer, candidates to start antineoplastic therapy. Patients with serious medical conditions that could limit the patients' ability to participate in the study and patients with dental conditions before conditioning therapy were excluded from the study. Each patient tasted randomly sixteen solutions prepared as follows
A. Salty Taste: NaCl at concentration: A1) 0.032 M, A2) 0.1 M, A3) 0.32 M, A4) 1M;
B. Sweet Taste: Sucrose at concentration B1) 0.032 M, B2) 0.1 M, B3) 0.32 M, B4) 1M;
C. Sour Taste: Citric acid at concentration C1) 0.001 M, C2) 0.0032 M, C3) 0.01 M; C4) 0.032 M;
D. Bitter Taste: Quinine hydrochloride at concentration: D1) 3.2 x 10⁻⁵ M, D2) 1x10⁻⁴ M, D3) 3.2 x 10⁻⁴ M, D4) 1 x10⁻³ M. The taste perception test consists of two separate subtests: one of stimulus identification and one evaluating the intensity of the same stimulus (from 0 to 10, where 0 signifying total absence of taste). The stimuli were analyzed by starting with the lowest concentration of the substance and proceeding to the highest, thus initially defining the threshold, i.e., the lowest concentration of the solution at which the subject is able to detect the taste. The same protocol was performed at various time intervals: before initiating antineoplastic therapy (T0), during therapy (T1), at the conclusion of the therapy (T2), All data were recorded in Microsoft Excel datasheets, and statistical analysis was conducted using IBM SPSS Statistics.

RESULTS

An initial observation of the data shows a similarity in the mean of perceived taste across the three times considered, with time T0 having a higher dispersion of taste values than T1 and T2. Oddly enough, the mean of perceived taste in T1 is more high than that in T2. At the same time, in T0 (pre-treatment) the average of perceived taste is the lowest. As for the taste variable, the average of the bitter taste (AM) appears lower than the remaining three tastes. Finally, the difference in perceived taste between dilutions is evident with the mean increasing as the dilution variable grows. The results in the chart 1 shows that the average threshold values is statistically lower at T2, decreasing compared with T0 and T1. The table 1 controls the difference in the mean of thresholds at different T. The results show that T0 and T1 are the same, while T2 is the one different and has a statistically lower threshold (p< 0,01). Regarding sour taste, there is a statistical difference in perceived taste being higher between T2 and times T0 and T1 (which are statistically equal). Analyzing the bitter taste, the results show that the perceived taste at T0 is statistically lower than at T1 and T2 (which are statistically equal). There is no statistical difference between times regarding the sweet taste (statistically insignificant only between T1 and T2). Finally, regarding salty taste, the perceived taste is statistically lower at T1 than at T0 and T2 (which are statistically equal). It is clear how the results do not show a true pattern among the different flavors, which seem to react differently in terms of perceived taste when we consider the time of administration (chart 2)

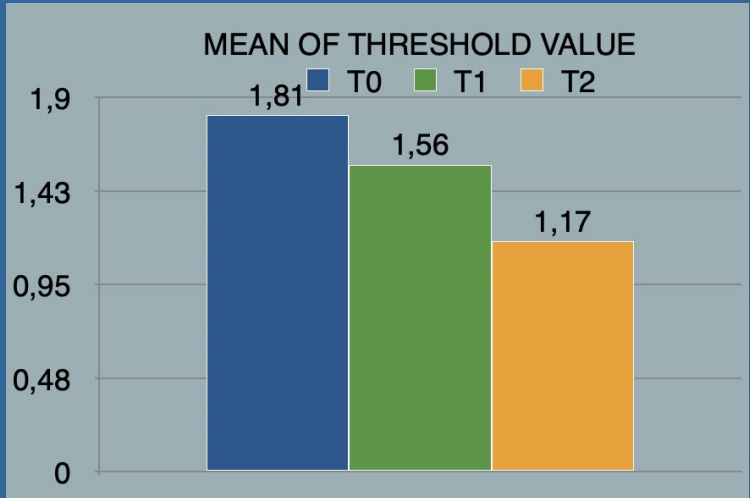


Chart 1. Mean of threshold value.

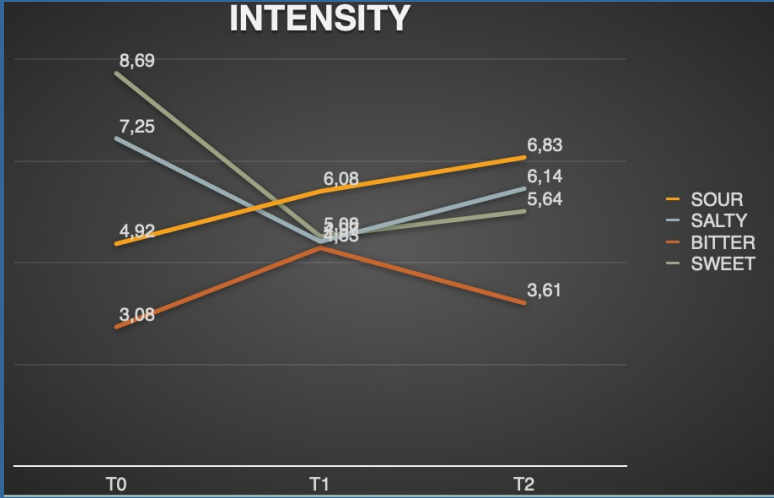


Chart 2: intensity of flavors during the time

Group 1	Group 2	Statistic	P-value adjusted
T0	T1	1,15	0,663
T0	T2	3,02	0,014 ***
T1	T2	2,28	0,086 *

Table 1. Post-hoc results on variable time (vs. threshold values), *** probability <10%, **probability <5%, *probability <1%.

DISCUSSION

The results show that there is a difference between times in perceived taste, with T2 statistically different from other periods. This difference, however, could be offset by tests conducted in the T0 period. A solution to the problem might be to repeat the test more than once (in the same time), or to do trials test before recording the results. The bitter taste is perceived to a lesser extent, this may be due to the calibration itself of the flavor or from the fact that the perception of flavor is altered. Similarly, the results show that the perceived taste of various flavors at different times differs without a definite pattern. Analysis of these differences may be the subject of future research

CONCLUSIONS

Taste alteration is a significant problem related to cancer therapy. The results of this study confirm that these patients may also suffer temporarily from altered taste sensations and reinforce the hypothesis that alterations in taste during cancer therapies should be routinely evaluated with the use of an objective, easy-to-use, low-cost method in order to identify factors that interfere with the patient's food intake.

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