

DENTAL STATUS IN BREAST CANCER PATIENTS DURING THE IV CYCLE OF CHEMOTHERAPY APPLYING PREVENTIVE MEASURES

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Abstract. *The study was focused on the impact of the preventive hygiene measures (PHM) on the manifestation of the side effects of cytostatic treatment in the oral cavity based on the evaluation of the patients' survey data and the exploration of the patients' oral mucosa status during the IV cycle of chemotherapy.*

All participants of the clinical study were divided into two groups. These groups of breast cancer (BC) patients with $T_1N_0M_0 - T_2N_1M_0$ stage included 26 and 63 patients. The patients' age ranged from 32 to 76 years in both groups.

Group 1 patients only brushed their teeth 1 time/day with any toothpaste, or didn't use any hygiene products at all. During the entire cycle of chemotherapy, Group 2 patients complied with a set of PHM, developed by us.

Fourth cycle of chemotherapy in BC patients significantly affects the condition of the oral cavity – 88.4 % of Group 1 patients showed signs of the side effects of cytostatic treatment in the oral cavity. The set of PHM was used in the comparison group during the IV cycle of chemotherapy to significantly reduce the incidence of pathological manifestations in the oral cavity in Group 2 patients to 66.7 %. The developed set of PHM contributes to a reliable decrease of only cheilitis incidence, which indicates the necessity for further improvement of methods of oral hygiene in BC patients during chemotherapy.

Key words: *breast cancer, oral cavity, mucositis, chemotherapy, preventive hygiene measures*

Advances in chemotherapy have ameliorated the results of cancer treatment. However, despite the constant improvement of cancer therapy, oral complications remain a constant problem for the majority of cancer patients [1, p. 18].

Traditional ineffective empirical schemes of assistance for chemotherapy-induced oral mucositis are gradually being revised to reflect the new paradigm of biopathology of the process and the results of clinical trials of dozens of drugs and

methods, including those focused on the newly allocated targets in the pathogenesis of oral mucositis [2, p. 44].

The incidence of various types of toxicity is diverse. Oral mucositis is recorded in 100 % of cases as a side-effect of high-dose chemotherapy for patients with hematopoietic stem cell transplantation. In non-hematological tumor localization in the course of cytostatic therapy, oral mucositis is defined in more than 30 – 40 % of cases [5]. At the same time, recent research suggests that the incidence of toxicity increases in the oral cavity to 84,6 – 96,2 % in patients, diagnosed with breast cancer [4]. This demonstrates the need for further improvement of preventive therapy methods in the oral cavity during chemotherapy in patients of this cohort.

The purpose of the current study was to examine the impact of the preventive hygiene measures on the manifestation of the side effects of cytostatic treatment in the oral cavity based on the evaluation of the survey data of patients and the exploration of the oral mucosa status of patients in the course of the IV cycle of chemotherapy.

Materials and methods. Our own clinical observations of 89 breast cancer patients (BC), who had received a comprehensive treatment of this pathology in the clinic “Grigoriev Institute for Medical Radiology of National Academy of Medical Science of Ukraine” in Kharkiv during the period from 11.2010 to 12.2013, have become the basis for this study. For the accuracy of the study’s results a homogeneous group of patients was selected: only women with malignant breast disease who have received a combined treatment (modified radical mastectomy (Madden) + radiotherapy), and 2 cycles of adjuvant chemotherapy in accordance with international healthcare standards with the same scheme [3].

The diagnosis “breast cancer” was morphologically verified in all patients.

All participants of the clinical study were divided into two groups. Patients in Group 1 only brushed their teeth 1 time/day with any toothpaste, or didn’t use any hygiene products at all. During the entire cycle of chemotherapy, Group 2 patients complied with a set of preventive hygiene measures, developed by us.

Group 1 consisted of 26 BC patients with $T_1N_0M_0$ – $T_2N_1M_0$ stage, whose age

varied in the range of 35 to 72 years. Mean age was (54.1 ± 9.2) years. The median age equaled to 55.5 years.

Group 2 included 63 BC patients with $T_1N_0M_0 - T_2N_1M_0$ stage, whose age ranged between 34 to 76 years. Mean age was (55.9 ± 1.1) years. The median age equaled to 58.0 years.

Patients' examination was performed before the start and at the end of the IV cycle of chemotherapy by common pattern: a survey, inspection, percussion, palpation, thermodiagnosics and paraclinical examination methods. The oral mucosal condition was assessed relying on the examination, noting the degree of hydration, the presence of congestion, fur, and other elements of lesions.

The manifestation of the side effects of cytostatic treatment in the oral cavity was assessed based on the patients' survey data. A questionnaire was developed and distributed between all patients, in which they denoted their complaints in detail during the IV cycle of chemotherapy.

The obtained data were put in a specifically designed unified card and subsequently used for statistical analysis. Statistical analysis of the obtained material was carried out using the software package STATISTICA.

Results

During the IV cycle of chemotherapy 23 (88.4 %) of 26 patients in Group 1 and 42 (66.7 %) ($p < 0,05$) of 63 patients in Group 2 presented various complaints.

When comparing the frequency of appearance and the nature of complaints in both groups of patients during the IV cycle of chemotherapy it was found, that the frequency of dry mouth and thirst complaints was increasing: from 30.4 to 66.7 % ($p < 0,05$) and from 39.1 to 50.0 % ($p < 0,05$), in Groups 1 and 2, respectively.

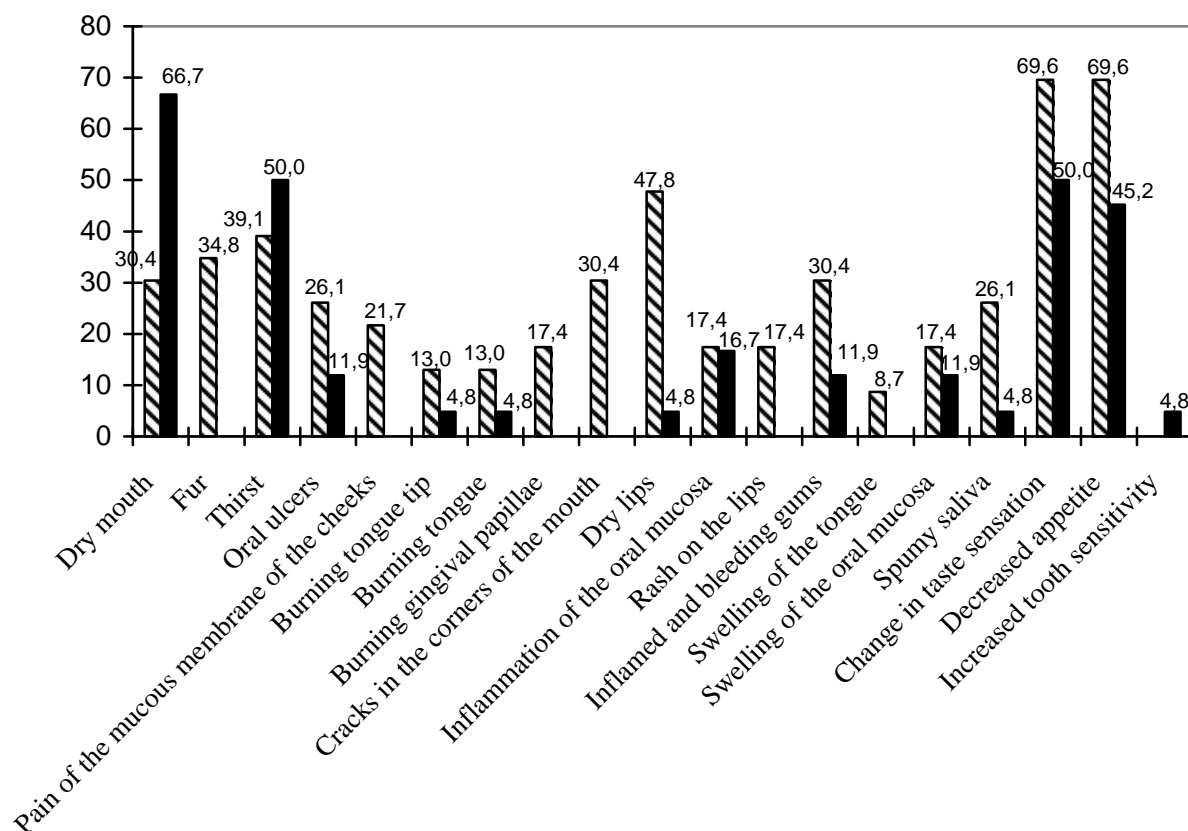


Fig. 1. Group 1 and 2 patients' complaints in the course of the IV cycle of chemotherapy

Complaints about the presence of oral ulcers in Group 2 decreased from 26.1 to 11.9 % ($p < 0,05$), of burning tongue and its tip – from 13.0 to 4.8 % ($p < 0,05$), dry lips – from 47.8 to 4.8 % ($p < 0,05$), inflamed and bleeding gums – from 30.4 to 11.9 % ($p < 0,05$), swelling of the oral mucosa – from 17.4 to 11.9 % ($p < 0,05$), spumy saliva – from 26.1 to 4.8 % ($p < 0,05$), change in taste sensation – from 69.6 to 50.0 % ($p < 0,05$), decreased appetite – from 69.6 to 45.2 % ($p < 0,05$), and increased tooth sensitivity in 2 Group 2 patients – 4.8 % (Fig. 1).

In the compared groups no differences are observed in the complaint of the inflammation of the oral mucosa – 17.4 and 16.7 % ($p < 0,05$), in Groups 1 and 2, respectively.

It should be mentioned that during the IV cycle of chemotherapy such complaints as fur, pain of the mucous membrane of the cheeks, burning gingival

papillae, cracks in the corners of the mouth, rash on the lips and the swelling of the tongue were absent.

Objectively, in 23 patients in Group 1 and 42 patients in Group 2 were determined: dry lips in 11 (47.8) and 2 (4.8 %) patients ($p < 0,05$), isolated ulcers – in 6 (26.1) and 5 (11.9 %) ($p < 0,05$), inflammation and swelling of the oral mucosa – in 4 (17.4) and 7 (16.7 %) patients ($p < 0,05$) (Fig. 2).

No other manifestations of the side effects of cytostatic treatment in the oral cavity were found.

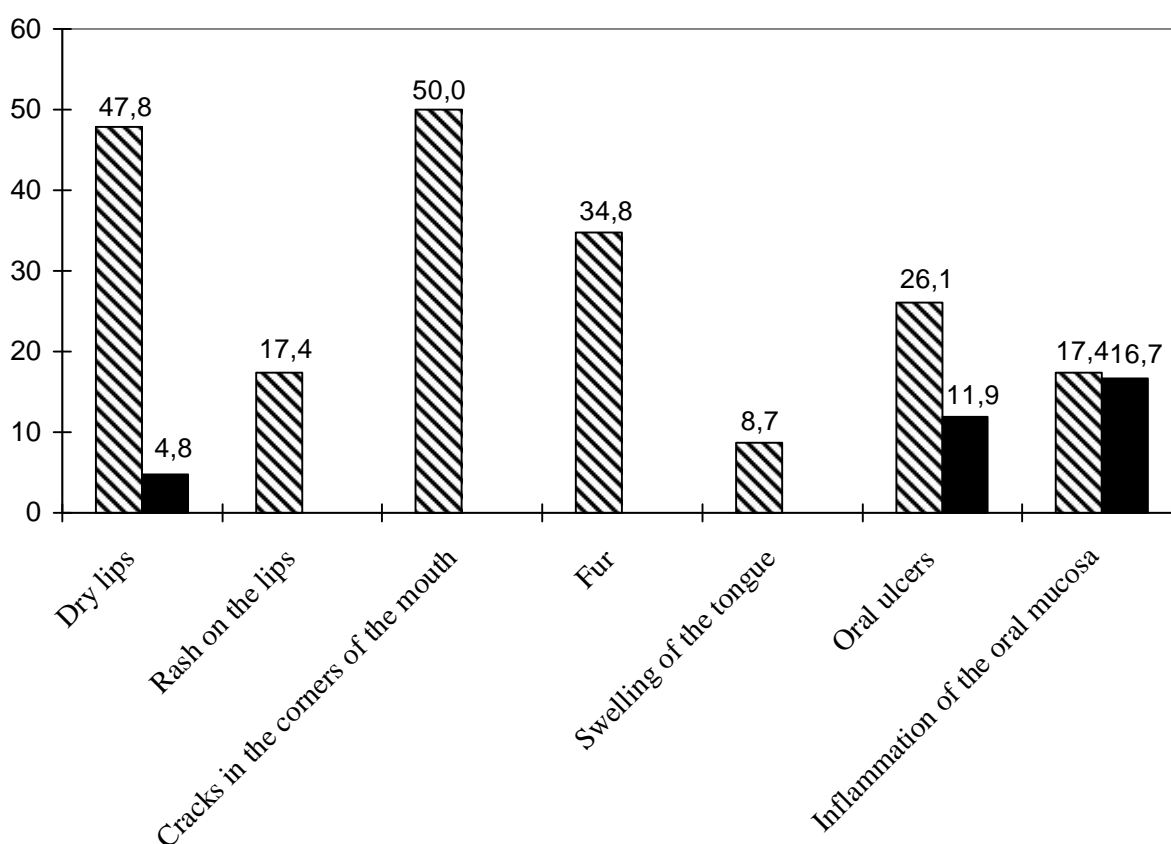


Fig. 2. Objective indicators of the side effects of cytostatic treatment in the oral cavity in Groups 1 and 2 patients in the course of the IV cycle of chemotherapy

On examination of the 3 patients in Group 1 who did not put forward any complaints, at the end of the IV cycle of chemotherapy were found such complaints as inflammation of the oral mucosa, fur on the back of the tongue, imprints of teeth on the sides of the tongue.

On examination of the 21 patients in Group 2 who also did not complain, at the end of the IV cycle of chemotherapy the condition of the oral cavity did not differ from the initial one.

Thus, the IV cycle of chemotherapy in breast cancer patients whilst complying with the set of preventive hygiene measures was accompanied by the development of cheilitis in 3.2 % (in 2 of 63 patients); mucositis of varying severity (I-II stage) – in 47.6 % (in 30 of 63 patients); and salivary gland dysfunction in 47.6 % (in 30 of 63 patients), (Fig. 3).

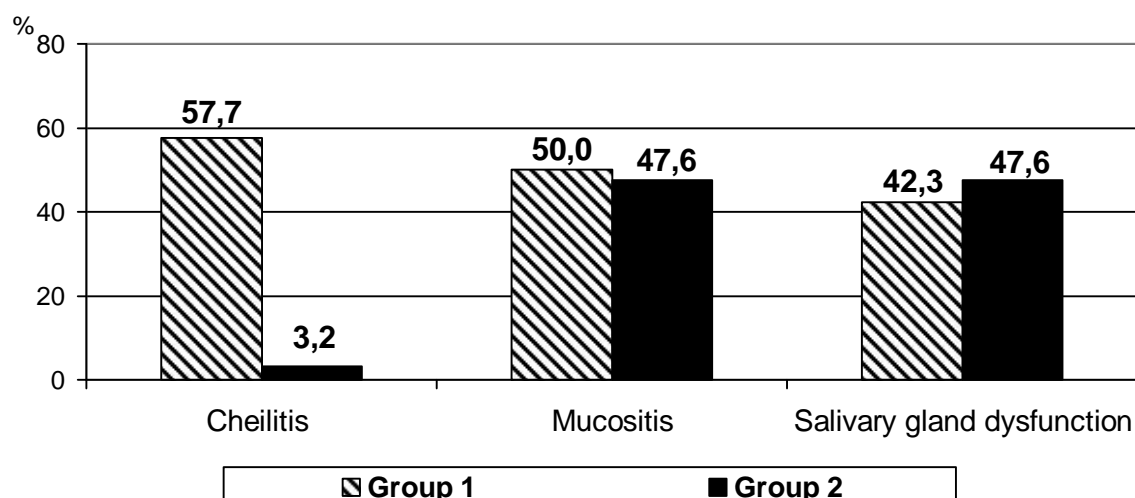


Fig. 3. Comparative analysis of the side-effects of cytostatic treatment in the oral cavity in Group 1 and 2 patients in the process of the IV cycle of chemotherapy

A comparative analysis of the pathological manifestations in the oral cavity revealed that in Group 2 the application of preventive hygiene measures contributes to a reliable reduction in the incidence of cheilitis over 18 times, but the levels of incidence of mucositis and salivary gland dysfunction did not significantly change.

Analyzing the data we can conclude that the use of the developed by us set of preventive hygiene measures during the IV cycle of chemotherapy contributes to a reliable decrease of only cheilitis incidence.

Conclusions. 1. In the course of the IV cycle of chemotherapy in 88.4 % of breast cancer patients in Group 1 we discovered signs of the significant side-effects of

cytostatic treatment in the oral cavity: cheilitis – in 57.7 %, mucositis – 50.0 %, salivary gland dysfunction – 42.3 %.

2. The set of preventive hygiene measures, developed by us and used in the comparison group, significantly reduces the incidence of pathological manifestations in the oral cavity of Group 2 patients to 66.7 %: cheilitis – 3.2 %, mucositis – 47.6 %, salivary gland dysfunction – 47.6 %.

3. The use of the developed set of preventive hygiene measures during the IV cycle of chemotherapy contributes to a reliable decrease of only cheilitis incidence, which indicates the necessity for further improvement of methods of oral hygiene in breast cancer patients during chemotherapy.

Prospects for future research

The perspective of this research lies in developing a set of therapeutic measures aimed at reducing the side-effects of chemotherapy in the oral cavity through the study of peculiarities of the oral mucosa and lips status in breast cancer patients as well as the effectiveness of applying our developed set of preventive measures.

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