

REVIEW ARTICLE

ORAL COMPLICATIONS OF CHEMOTHERAPY: A REVIEW

Chandan Venkatesh¹, Maithilee Jani¹, Anshul Shah²

¹B.D.S., Bangalore Institute of Dental Sciences and Research Institute, ²B.D.S., Ahmedabad Dental College & Hospital

ABSTRACT:

Platelet- rich fibrin is a second generation platelet concentrate and is defined as an autologous leukocyte and platelet-rich fibrin biomaterial. It was first developed by Choukroun for the first time in France. It has been used extensively in various disciplines in dentistry. In periodontal therapy it is used in combination with bone graft materials for periodontal regeneration, ridge augmentation, sinus lift procedures for implant placement and for coverage of recession defects in the form of a membrane. This membrane consists of a fibrin 3-D polymerized matrix in a specific structure, with the incorporation of platelets, leukocytes, growth factors and presence of circulating stem cells.

Key words: platelet rich fibrin, regeneration, growth factors.

Corresponding author: Dr. Anshul Shah, Ahmedabad Dental College & Hospital, Email Id: anshul_90909@yahoo.com

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INTRODUCTION:

Oral problems arising as a result of the radiotherapy of the head and neck region, or chemotherapy for any malignancy can compromise patient's health and standard of life, and influence their capacity to complete planned carcinoma treatment. Commencement and enactment of an inclusive oral health program that supervise and treats patients before, during and after chemotherapy is of supreme significance. Accompanied by best tantamount of achievement of the complete treatment team, counting medical and dental sources, the patient's durability and standard of life will be magnified. The risk of chemotherapy side effects is determined by a range of elements, counting the high cell turnover rate of the oral mucosa, the difference and complexity of the oral microflora, and soft tissue trauma during usual oral purpose. Within the future, dentists are growingly more and more to detect that

they have patients in their care who may present before or after carcinoma treatment compulsory required urgent dental care. Suitable preventive regimens and convenient oral care can decrease hurdles and enhance quality of life.

Sonis et al. [1] classified the oral complications related to chemotherapy into two major forms: Direct and Indirect Toxicity. Age has been proved to be a major factor in relation to the effects of chemotherapy to oral cavity. Younger the patient, more adverse are the side effects. Studies over the world have demonstrated that approximately around 40% of patients receiving chemotherapy have presented with oral complications, however when the study was divided in age groups, analysis showed that if the patient is under 12 years of age, the value comes to 90%. The most likely explained hypothesis is the elevated rate of mitosis in the cells of oral mucous membrane in this age group [2].

Table 1: Oral Complications Of Chemotherapy

Oral Mucositis	Oral Mucositis due to chemotherapy is due to effects on the turnover rate of the mucosal membrane.
Infection	Bacterial, fungal and viral infections as a result of injury to mucosa due to chemotherapy.
Xerostomia	Dryness of oral cavity as a result of depressed salivary flow which further elevates the risk of infection and dental caries
Cognitive impairment	Chemotherapy has a major influence on the cognitive functions of the subject, most commonly the ability to masticate as well as speech.
Dysgeusia	Alteration in the gustatory cells and taste buds due to chemotherapy will lead to dysgeusia.
Nutritional compromise	Since the patient is already having a disability from oral ulceration as well as inflammation, along with a loss of appetite and dysgeusia, the nutritional intake of the person is severely compromised.

ORAL MUCOSITIS: Oral mucositis is characterized as the swelling and ulceration of the oral mucosa [3-4]. Oral mucositis is a fairly common side effect of chemotherapy influenced and complicated by the other side effects of chemotherapy which includes dysgeusia and neutropenia [5]. Programmed cell death as well as the daily turnover epithelial rate of mucosa is adversely influenced by the direct injury to the mucosa by the chemotherapy [6]. The indirect effects on the mucosa which influences the development of bacterial or fungal as well as viral infection over the mucosa with the help of mediators is induced by chemotherapy [7].

INFECTIONS: Whenever a patient is receiving chemotherapy, the most major side effect is the direct attack on the bone marrow. Especially, the population of white blood cell is very severely affected. The cell count of WBCs may go down to 500 cells only from a normal range of 7,000 to 10,000. This will ultimately expose the patient and elevate susceptibility to infections. Neutropenia, defined as a direct decrease in the cell population of WBCs is one of the major reasons behind infection susceptibility. If the patients acquires a trivial infection, the condition of the patient may worsen resulting into death. It is important to identify the situation as soon as possible, to prevent signs and symptoms of infections which usually involves a high fever followed by shivering and other flu similar symptoms.

XEROSTOMIA: Xerostomia is a condition characterized by a state of oral dryness, which is most frequently affiliated with the depressed function of the salivary glands [8]. Xerostomia, is a relatively usual side effect of both the chemotherapy as well as radiation therapy, which is commonly employed in the treatment of carcinoma in oral and maxilla-facial region [9]. Furthermore, radiation dosage between 20-52Gy causes maximum damage to the salivary glands. The patient could be effectively treated by stimulating the salivary glands with the help of drugs as well using salivary substitutes.

COGNITIVE IMPAIRMENT: A relatively less number of subjects who had been successfully treated for cancer with the help of chemotherapy had reported the impairment of cognitive functions. The condition is referred by many as the Post-chemotherapy cognitive impairment (PCCI). The percentage has elevated in last decade to 25%. Consequently, the complication was noticed when a certain group of carcinoma survivors reported the presence of detrition in cognitive functions like memory and speech fluency among other functions [10]. Studies over a period proved that the most affected areas involved vision as well as memory and gait [11]. Other problems include disability of higher learning, difficulty in continuous concentration and loss of appropriate reasoning.

DYSGEUSIA: A condition in which a person completely loses a sensation of taste is referred to as the Ageusia. Dysgeusia, a commonly observed state of taste alteration is seen in patients undergoing

chemotherapy. This condition severely affects the nutritional status of the person due to reduced appetite [12]. The basic reason proposed for the loss of taste sensation is that some of the chemotherapeutic agents get secreted in the saliva and come in straight contact with the gustatory cells and taste buds. The basic sensation reported by most of the subjects suffering from dysgeusia due to chemotherapy is a metallic taste in the mouth [13]. The lost sensation of taste may even last for a long time in some patients even after the completion of chemotherapy.

SUITABLE MEASURES: Some of the basic instructions given to the patients suffering from the chemotherapy involves basic oral cancer. The patient is advised to maintain optimum oral hygiene by properly brushing technique along with soft bristle tooth brush and fluoride toothpaste. The patient is instructed to report any ulcers or bleeding in the mouth. Subject is advised to avoid alcohol or tobacco and get rid of any acidic food products. The patients receiving chemotherapy are at an elevated risk for osteonecrosis in the mandible, hence the dentist is instructed to keep the patient under antibiotic cover as well as hyperbaric oxygen chamber if at all any oral surgical procedure is indicated. Appropriate treatment of the oral complications of chemotherapy would ideally involve the proper assessment of high-risk group followed by proper public education. Pre-treatment and post treatment interventions both play an extremely critical role. Management should be preventive and therapeutic to delineate the risk for oral and related systemic complications.

CONCLUSION: Patient's physical fitness as well as the standard of living is highly jeopardized by the complication in the oral cavity due to chemotherapy and radiation therapy in patients undergoing treatment for the carcinogenic condition. The complications may be very mild that the patient may not complain or may be so strong, that the patient will condone only lower tolerable doses of chemotherapy or may ultimately give up on the treatment. Oral Cavity complications may not remain localized but instead spread to some serious systemic infections .If appropriate medical care is

provided prior, during and post chemotherapy, the oral complications can be kept in control leading to an enhanced improvement in the patient morbidity.

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