



Dental Management in Patients on Chemotherapy

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Received: 📅 February 11, 2021

Published: 📅 February 25, 2021

Abstract

Head and neck cancer is a major health problem worldwide. It is a major global health unit, with about half a million new cases diagnosed per year and their incidence appears to be increasing in developing countries [1]. The cancer and cancer therapies are associated with morbidities that may negatively affect the quality of life from the time of diagnosis, during and after cancer treatment and continue throughout the life of the patient [2]. The aim of this article is to isolate and describe the oral side effects arising only from chemotherapy and focus on the dental management of these patients.

Keywords: Chemotherapy, oral care

Introduction

Cytotoxic chemotherapy drugs act by interacting with the cancer cell DNA or RNA. The extent of toxicity upon normal tissues seems to be correlated to the dose of anti-neoplastic drugs used, frequency of agents' administration. Many drugs target rapidly proliferating cells. They have the same action upon rapidly proliferating normal tissues such as bone marrow, intestinal mucosa, oral mucosa, hair follicles, and gonads [3]. The principle chemotherapeutic agents are taxol and derivatives, platinum derivatives (cis-platin and carboplatin), 5-fluorouracil and hydroxy urea [2]. These agents are employed as primary treatment agents, as adjuvant treatment, or as palliative medications [5]. Particularly in the oral mucosa they destroy the basal cells of the mucosal layer, and their replacement and turnover is affected resulting in mucosal ulceration. Moreover salivary gland function is impaired. The most common adverse effects are the oral mucositis, osteonecrosis of the jaw, infections (bacterial, fungal, viral), dental anomalies, xerostomia, taste changes, bleeding, neurotoxicity, oral hyperpigmentation-melanosis, toxic epidermal necrolysis [2]. Since the oral cavity is a usual site of pain and discomfort caused by chemotherapy, dentist contribution to patients' relief is extremely important.

The Management of Patients on Chemotherapy can be divided into 3 Phases:

Before chemotherapy

It is very important to consult the oncologist before conducting any procedures in patients. [4] The oncologist should inform about the patient's current health status, the characteristics of the pathology and the anti-neoplastic therapy to be prescribed [4].

- A. Conduct a pretreatment oral health examination and prophylaxis;
 - I. It includes dental history with a radiographic baseline, periodontal and evaluation, prognosis of the existing restoration,
 - II. Investigations like quantitative sialometry are very useful and can help, evaluate, predict and manage the potential xerostomia.
- B. All possible sources of dental inflammation should be addressed.

- C. Periodontal index (PI) , gingival index (GI) , DMFT can indicate patients oral hygiene .
- D. Dentist should organise his/ her treatment plan keeping in mind the patient's immune status.
- E. Careful denture fitting and the adjustment of a traumatic prosthesis should be completed.

Prevention of any infection and maintenance of oral hygiene is most important ,Instruction concerning oral hygiene and caries prevention should be reinforced to the patient. Dental fluoridation and chlorhexidine are highly recommended [3].

In children:

- A. Fissure sealing and crack restoration In recently erupted teeth, especially in molars and premolars are mandatory.
- B. In cases of irreversible pulpitis initial bio mechanical preparation of the canal is suggested.
- C. In chronic periapical situation, endodontic procedures are performed when there's time interval of 7 days between completion of endodontic therapy and the initiation of chemotherapy.
- D. Teeth with poor or questionable prognosis should be extracted. it should be performed 2-3weeks before the onset of chemotherapy.
- E. Platelet Transfusion is required if the platelet count is under 40,000/mm³.
- F. Antibiotic prophylaxis is necessary if granulocyte is under 2000/ mm³.
- G. Trauma from extraction or any other invasive procedures should be minimal.
- H. Major surgeries should be completed 4-6 weeks before the onset of chemotherapy [3].

During chemotherapy

The patient is most sensitive when chemotherapy is initiated. It is advisable not to undertake any elective procedures during this period .in case of emergency,

- a. Ask the oncologist to order blood work 24 hrs before oral surgery or postpone other invasive procedures when :
 - b. platelet count is less than 75000/mm³.
 - c. absolute neutrophil count is less than 1000/mm³ [4].

However Dental hygiene must be preserved and cariogenic food must be avoided. Fluoridation, Chlorhexidine can maintain dental help. Tooth brushing can take place when the oral pain resolves. Toothpaste containing 1450 Ppm sodium fluoride is recommended.

Patients report with most discomfort and pain during this period.

- a. For mucositis, benzydamine hydrochloride oral rinse prior to chemotherapy.
- b. Pain must be addressed and analgesics Chosen are paracetamol or metamizole.
- c. Antibiotic administration is useful when needed.
- d. NSAIDs are forbidden because of their harmful interaction. Its combination with methotrexate increase risk of hemorrhage.
- e. A combination of NSAIDs with corticosteroid may increase the risk of gastric ulcers. NSAIDs with cyclosporine can multiply risk of nephrotoxicity.
- f. For Candidacies systemic antifungal drugs are used to treat outbreaks (Nystatin).
- g. No extraction or even minimal surgical procedures should be performed.
- h. Tooth scaling and root planning are contraindicated due to high risk of infection.
- i. In case of patience has received bis phosphonates all of the treatment should be carefully monitored to avoid trauma or frictional ulcers.
- j. Denture should be removed if they are minimally traumatic.
- k. Emergency procedures should be covered by antibiotics. Extraction should take place only in emergency followed by Socket curettage, removal of any debris, and finally suturing [3].

After chemotherapy

Place the patient on a dental recall schedule when chemotherapy is completed and all side effects including immune suppression has restored [4]. The treatment is designed to remove necessary foci of infection and to restore aesthetic and any functional impairment.

- a. High concentration fluoride toothpaste is recommended, Chlorhexidine rinses every night for at least 3 weeks.
- b. Patient can take high calorie diet under supervision of dentist.
- c. Extraction and other invasive procedures should be avoided for at least one year. If emergency precaution by antibiotic coverage 48 hours before procedure and continue for 7- 15 days.
- d. Denture use should be avoided for 1 year. If this is not possible , the construction of denture should be postponed for 4-6 months following chemotherapy.

- e. When placing implant, the risk of bisphosphonate - related osteonecrosis of the jaw is significant.
- f. In patients who had implants placed prior need to be examined every month for the first 3 months is recommended , and then every 3 months for the first year [3].

Bisphosphonate-Related Osteonecrosis of the Jaw

Bisphosphonate-related osteonecrosis of the jaw (BRONJ) is a chronic condition of the oral cavity resulting in mucosal ulceration and exposure of underlying necrotic bone, and the ensuing secondary complications. Patient with BRONJ usually present with ulceration of the oral mucosa with exposure of underlying necrotic bone. Mucosal erythema or swelling may precede the ulceration, with mobility of teeth local to this area. BRONJ Progression results in increased necrotic bone ulceration and complication include formation of oro-cutaneous fistulae and pathological fractures [6].

Patient may be considered to have BRONJ if they have all of the following criteria

- Current or previous treatment with a bisphosphonates
- Exposed bone in the maxillofacial region that has persisted for more than eight weeks
- No history of radiation therapy to the jaws

Patient on IV BPs are at greater risk of BRONJ than those taking oral BPs , with risk increasing with duration of treatment and malignant diagnosis.

Patient should be encouraged to reduce their risk factors, including smoking cessation, reducing alcohol intake, and improving oral hygiene.

Patient aim of BRONJ management is prevention of infection of the necrotic bone and reduction of symptoms. In the first stage where no sign of inflammation is present, it is referred as stage 0 and is managed with drugs for pain when indicated. Antimicrobial

mouth rinses are recommended such as chlor hexidine 0.12%(corsodyl). If there is any evidence of infection (stage 2 and 3)in addition to mouth rinses, treatment with oral antibiotics(Eg: co-amoxiclav) is essential . If a necrotic bony sequestrum is found, minimal surgical debridement is performed. In advanced cases micro vascular reconstruction with bone and soft tissue free-flaps may be required [7].

Conclusion

Chemotherapy can be associated with multiple side effects which affects patient quality of life. Cancer chemotherapy is changing rapidly, as established protocols evolve and are refined and new therapeutic approaches are introduced [5]. An interdisciplinary approach , including dental professionals is required to work in close collaboration with the patient to regularly and by validated outcome measures to evaluate, prevent, and treat oral complications of cancer therapies [2].

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DOI: [10.32474/JCCM.2021.03.000153](https://doi.org/10.32474/JCCM.2021.03.000153)



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