

Oral And Dental Evaluation Of Bone Marrow Transplant Patients: A Retrospective Observational Study

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Abstract:

This retrospective observational study aims to evaluate the oral and dental conditions of 100 bone marrow transplant (BMT) patients. The study assessed oral pathologies, including root canal treatments, extractions, squamous cell carcinoma cases, oral prophylaxis procedures, and restorations. The findings provide valuable insights into the oral health challenges faced by BMT patients, emphasizing the need for specialized dental care and preventive measures in this vulnerable population.

Keywords: Bone marrow transplant, oral and dental evaluation, retrospective study, oral prophylaxis, root canal treatment, extractions, squamous cell carcinoma.

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I. Introduction:

Bone marrow transplant (BMT) patients often experience compromised immune systems and oral complications due to the underlying disease and intensive treatments. Understanding the prevalence and types of oral conditions in these patients is crucial for developing appropriate preventive strategies. This study retrospectively observed 100 BMT patients to assess their oral and dental health status.

Hematopoietic cell transplantation (HCT) is now one of the frequent procedures used for the treatment of malignant and non-malignant blood diseases, autoimmune disorders, and certain solid tumors in the oral cavity acute, delayed, and late side effects of the transplantation regimen affect approximately 80% of the patients¹

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In the early post-transplantation period, mucositis resulting from conditioning is the main clinical symptom which varies in degree and severity and depends primarily on the intensity of the conditioning regimen.

In the first year after transplantation, the oral cavity is affected by delayed complications like hyposalivation, taste disorders, and dentin hypersensitivity, which often importantly decrease the patient's quality of life.

Additionally, there remains a high risk of infection and bleeding in this period. At later stages, long-term complications, from which oral chronic GvHD(graft vs host disease) is the most important, may contribute to sicca syndrome, mastication impairment, malabsorption syndrome, and lichen planus lesions in some cases.

Also, other complications like advanced periodontal disease, rapid caries, and taste disorders are common. It is significant to remember about the risk of secondary cancers.

Although oral problems can compromise the treatment protocol and, in some cases, affect the chance of survival, they are still underestimated and undertreated².

II. Methods:

A retrospective analysis was conducted on the records of 100 BMT patients who visited Sri Shankara Cancer Hospital Bengaluru between January 2022 and December 2022. Data regarding oral and dental conditions were collected, including the presence of root canal treatments, extractions, squamous cell carcinoma cases, oral prophylaxis procedures, and restorations. Descriptive statistics, such as pie charts, bar graphs, and flowcharts, were generated to present the findings.

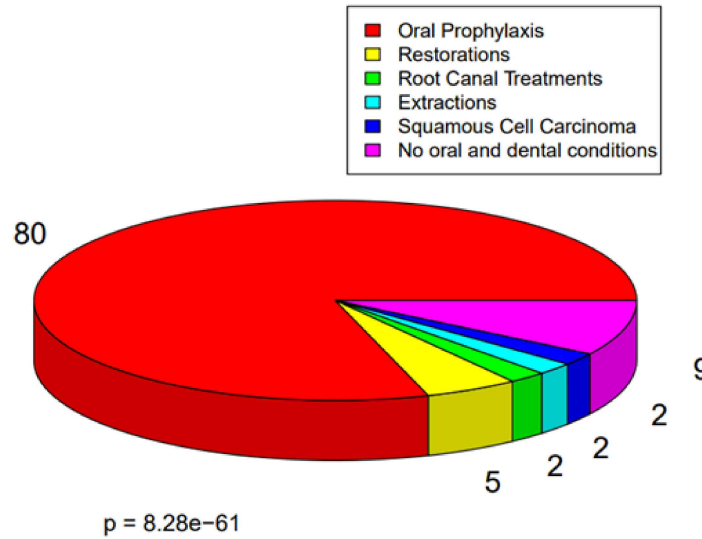
III. Results

Out of the 100 BMT patients observed, the following oral and dental conditions were identified:

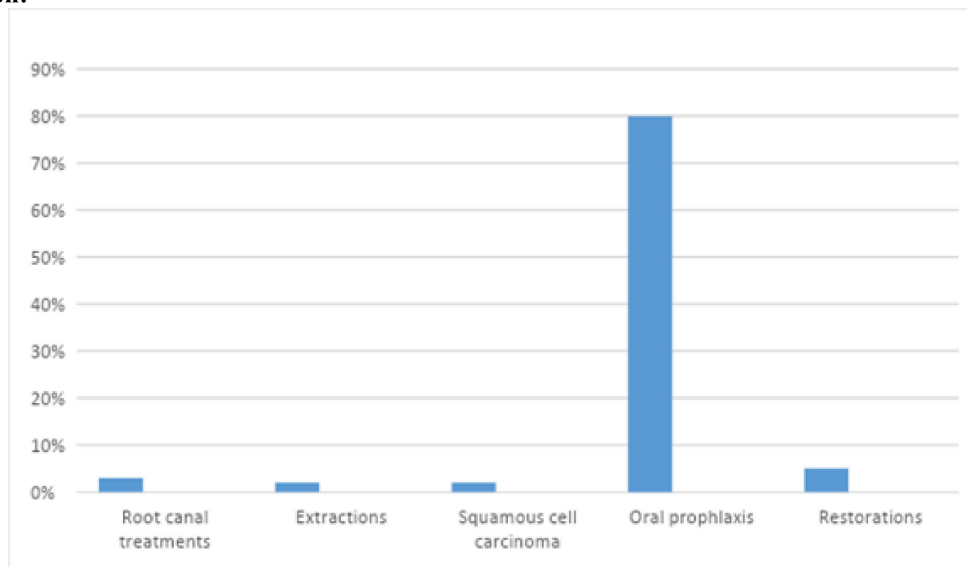
- Root Canal Treatments: 3 patients (3%)

- Extractions: 2 patients (2%)
- Squamous Cell Carcinoma: 2 patients (2%)
- Oral Prophylaxis Procedures: 80 patients (80%)
- Restorations: 5 patients (5%)

Pie Chart:



Bar Graph:



IV. Discussion:

The findings of this study highlight the significant prevalence of oral prophylaxis procedures among BMT patients, with 80% of the observed cases requiring such interventions. This emphasizes the importance of regular dental cleanings and preventive measures to maintain oral health in this patient population. Additionally, 3% of patients needed root canal treatments, 2% required extractions, and 2% were diagnosed with squamous cell carcinoma. These results indicate the need for specialized oral care protocols, early detection of oral cancers, and timely management of dental infections in BMT patients.

Broad considerations for the oral care regimen before Hematopoietic Cell Transplantation

Before a transplant, a comprehensive medical check-up is required, which should encompass a meticulous cleaning of the oral cavity. This procedure should ideally be performed by a seasoned dentist who is preferably an integral part of the transplant team. The dental process should involve examining the patient, formulating a treatment plan, carrying out the necessary dental procedures, educating the patient about potential therapy side effects, providing oral hygiene guidelines, implementing fluoride prevention measures, and suggesting antibacterial mouthwashes.³

Establishment of a treatment plan and its limitations

Standard procedures for the oral cavity before transplantation should primarily include the detection and removal of active and potential infection sources within the stomatognathic system, as well as the elimination of local factors that could cause trauma, pain, and bleeding.

In an ideal scenario, all existing and potential sources of bleeding and pain should be addressed before the start of the conditioning. However, based on our experience, achieving a completely sanitized oral cavity before transplantation isn't always possible. Factors that can alter the oral treatment plan include the urgency of the transplant, the patient's overall health and remission status, peripheral blood counts, the nature and complexity of the oral disease, the patient's financial resources, motivation, and limited access to dental services. There is a lack of well-defined oral treatment protocols in existing literature regarding the indications for specific dental procedures before HCT. This is particularly true for the treatment of teeth with chronic pulpal/periodontal pathology, which can potentially be a source of infection.

The most controversial question is: extraction or treatment? Some authors suggest a radical approach. They propose the removal of all teeth with uncertain prognosis as the only choice⁴

Other studies, by contrast, recommend minimally invasive pre-HCT dental treatment, which means that in time constraints, acute pathologies and nonrestorable teeth should be removed primarily⁵

It is emphasized that untreated chronic dental pathologies do not have a statistically important influence on post-HCT infections. Tooth extraction is associated with an increased risk of bleeding and also can attract prolonged wound healing, a potential entry for infection.

For optimal results, the evaluation should ideally be conducted even before the recipient's final medical check-up. An early start can help prevent unnecessary extractions and improve the patient's quality of life post-transplantation. It is advisable to finish all dental treatments at least 2 weeks before the start of the conditioning regimen.

However, due to the patient's compromised medical status, HCT referrals are often urgent. As a result, the initial dental examination often occurs very close to the start of the HCT procedure, limiting the time available for oral treatment. If sanitation cannot be completed in a clinic due to time constraints, the focus should primarily be on immediate needs: eliminating active infections (such as acute periodontal/periapical pathologies), removing potential sources of bleeding and/or pain, and extracting non-restorable teeth (like exposed root tips).

Elective treatments can be addressed at a time when the patient is in good condition. The toxicity of the conditioning regimen is also taken into consideration. The lower risk of general and oral complications allows for reduction indications for teeth extractions and to application of conservative treatment instead. Extended indications for extractions are suggested particularly in case of (1) high risk of early complications, as a result of high-dose cytotoxic conditioning and expected aGvHD; (2) high risk of long-term complications, especially in high risk of cGVHD; and (3) the patient's poor motivation for oral hygiene (Appendix 3). But, it has to be mentioned that multiple extractions increase the risk of bleeding, infection, delayed wound healing, and possible postponement of medical treatment

We observe that they can also badly affect the long-term health conditions and quality of life, because removal of many teeth may compromise nutrition and have negative consequences for occlusion and esthetic aspects as well.

V. Conclusion:

The retrospective observational study shed light on the oral and dental conditions of 100 bone marrow transplant patients. The results emphasize the need for specialized dental care and preventive measures, such as regular oral prophylaxis procedures, in this vulnerable population. The findings can serve as a foundation for future research and the development of tailored dental management guidelines for BMT patients.

Patients who are undergoing hematopoietic stem cell transplantation frequently experience oral health issues that are a result of the underlying disease or treatment. These complications can pose a health risk and may even be life-threatening during the HCT process. Proper dental care can help mitigate these risks. Currently, there are no universally accepted guidelines for dental examination and treatment of patients before HCT. It is recommended that each transplant center develop and implement its dental care protocol, drawing

from available research and its own clinical experience. To achieve the best outcomes, it is crucial to have skilled dental professionals as permanent members of the transplantation teams.

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