

# Cryotherapy Effect on Oral Mucositis Severity Among Recipients of Bone Marrow Transplantation: A Literature Review

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Oral mucositis is a distressing toxic effect of cancer therapy and one of the major side effects of the myeloablative conditioning used to prepare patients for bone marrow transplantation (BMT). Oral cryotherapy is one of the recent modalities used to prevent and manage oral mucositis. The purpose of this review is to clarify the cryotherapy effect on oral mucositis severity among patients receiving myeloablative conditioning followed by BMT. A literature search was performed using six different electronic databases: CINAHL®, MEDLINE®, Nursing Ovid, PubMed, Springer, and Science Direct. Six articles were deemed relevant and included in this review. Oral mucositis increases mortality rate, length of hospital stay, opioid use, and the need for parenteral nutrition usage. It also decreases patient's quality of life and his or her desire to complete treatment. However, oral cryotherapy significantly minimizes the incidence and severity of oral mucositis and decreases secondary oral mucositis complications. Using oral cryotherapy concurrently with a regular oral care protocol can improve its efficacy for preventing and managing oral mucositis. Additional studies should be conducted to create standard oral cryotherapy protocols.

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Key words: cryotherapy; oral cryotherapy; myeloablative; bone marrow transplantation; hematopoietic stem cell transplantation; oral mucositis; prevention

Digital Object Identifier: 10.1188/14.CJON.E84-E87

Oral health is an important component of individual health, and any alteration will reflect directly on quality of life (Eilers & Milloin, 2011). Therefore, different oral care protocols and strategies were established for patients with cancer to prevent and minimize oral mucositis. Oral cryotherapy is an application of ice chips or ice water prior to, during, and after the infusion of chemotherapy and is one of the recent modalities to prevent and manage oral mucositis (Salvador, Azusano, Wang, & Howell, 2012). Oral cryotherapy works by inducing vasoconstriction to the oral mucosa blood vessels to decrease exposure to chemotherapy. Use of cryotherapy shows a decrease in the incidence and severity of oral mucositis induced by chemotherapy (Gori et al., 2007; Svanberg, Öhrn, & Birgegård, 2010).

Myeloablative conditioning is a high dose of chemotherapy or a combination of chemotherapy and radiotherapy that is used in bone marrow transplantation (BMT) protocols to

prepare patients for the transplantation. The goal of using myeloablative conditioning is to eradicate the residual malignant cells and make space for the new stem cells used for engraftments (Brown, 2010; Rimkus, 2009). Oral mucositis is affected by different factors, such as disease type, conditioning regimen, and any other underlying disease (Eilers & Milloin, 2011). About 70%–99% of patients receiving myeloablative conditioning for BMT experience severe oral mucositis (Gori et al., 2007; Kashiwazaki et al., 2012). Patients with oral mucositis (67%–86%) also experience oral pain (Brown & Wingard, 2004; Svanberg, Birgegård, & Öhrn, 2007). Oral mucositis prolongs hospital length of stay, decreases the patient's quality of life, and increases the need for parenteral nutrition and pain management, as well as increases the risk for infection (Stone, Fliedner, & Smietc, 2005). The purpose of this article is to clarify the effect of cryotherapy on oral mucositis among patients receiving myeloablative conditioning followed by BMT.