



Prophylactic Photobiomodulation therapy (PBM) for Preventing Oral Mucositis in Patients Undergoing Hematopoietic Stem Cell Transplant (HSCT)

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BACKGROUND

- Oral mucositis is a common and painful complication in cancer patients, particularly those undergoing chemotherapy and radiotherapy
- It is especially prevalent in individuals receiving Hematopoietic Stem Cell Transplantation (HSCT), where up to 75% may be affected
- Mucositis significantly impacts patients' quality of life, causing pain, difficulty eating, and increased risk of infections
- Previous research has suggested that Photobiomodulation (PBM) therapy may reduce the severity of mucositis, improving recovery and patient well-being
- Aim of the Study:** This study aims to assess the impact of PBM on the incidence and severity of oral mucositis among patients undergoing HSCT within the Oncoclinicas Network in Southeast Brazil

METHODS

Study Design

Observational study

Study Population

Patients diagnosed with hematological cancer and scheduled to undergo HSCT

Intervention

Patients enrolled in the PBM program underwent an initial oral health assessment prior to transplantation

Following HSCT, participants received daily follow-up assessments until marrow engraftment. The intervention included:

- Daily PBM therapy sessions
- Topical vitamin E application
- Oral care instructions For patients who developed mucositis, follow-up continued until complete resolution

Endpoint

- Any grade of mucositis assessed using CTCAE

Statistical Analysis

- Descriptive analysis, comparison of proportions, Wilcoxon rank-sum test, Kaplan-Meier survival analysis, and logistic and Cox regression

RESULTS

Table 1. Patient's characteristics (N=137)

Characteristics	N (%) / M (SD)
Age [M(SD)]	49 (13.6)
Sex [N (%)]	
Male	71 (51.8)
Female	66 (48.2)
Marital Status [N (%)]	
Single	37 (27.0)
Married	73 (53.3)
Divorced	24 (17.5)
Tumor Site [N (%)]	
Multiple Myeloma	56 (40.9)
Acute Myeloid Leukemia	23 (16.8)
Non-Hodgkin Lymphoma	23 (16.8)
Acute Lymphoblastic Leukemia	13 (9.5)
Hodgkin Lymphoma	7 (5.1)
Others	15 (10.9)
Type of HSCT [N (%)]	
Autologous HSCT	84 (61.3)
Related Allogeneic HSCT	25 (18.2)
Haploidentical HSCT	19 (13.9)
Unrelated Allogeneic HSCT	6 (4.4)

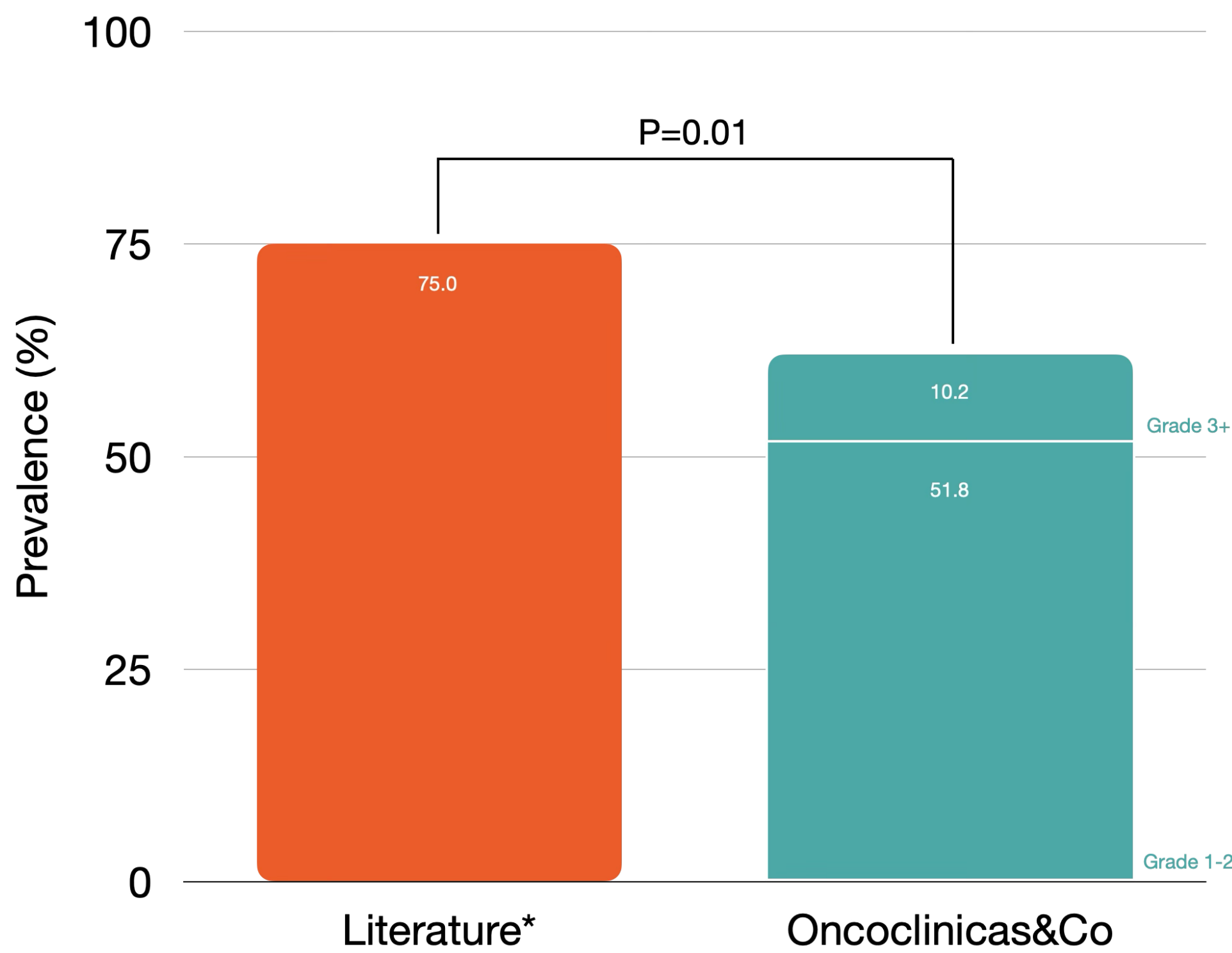


Figure 2. Mucositis rate: study findings vs. literature

RESULTS

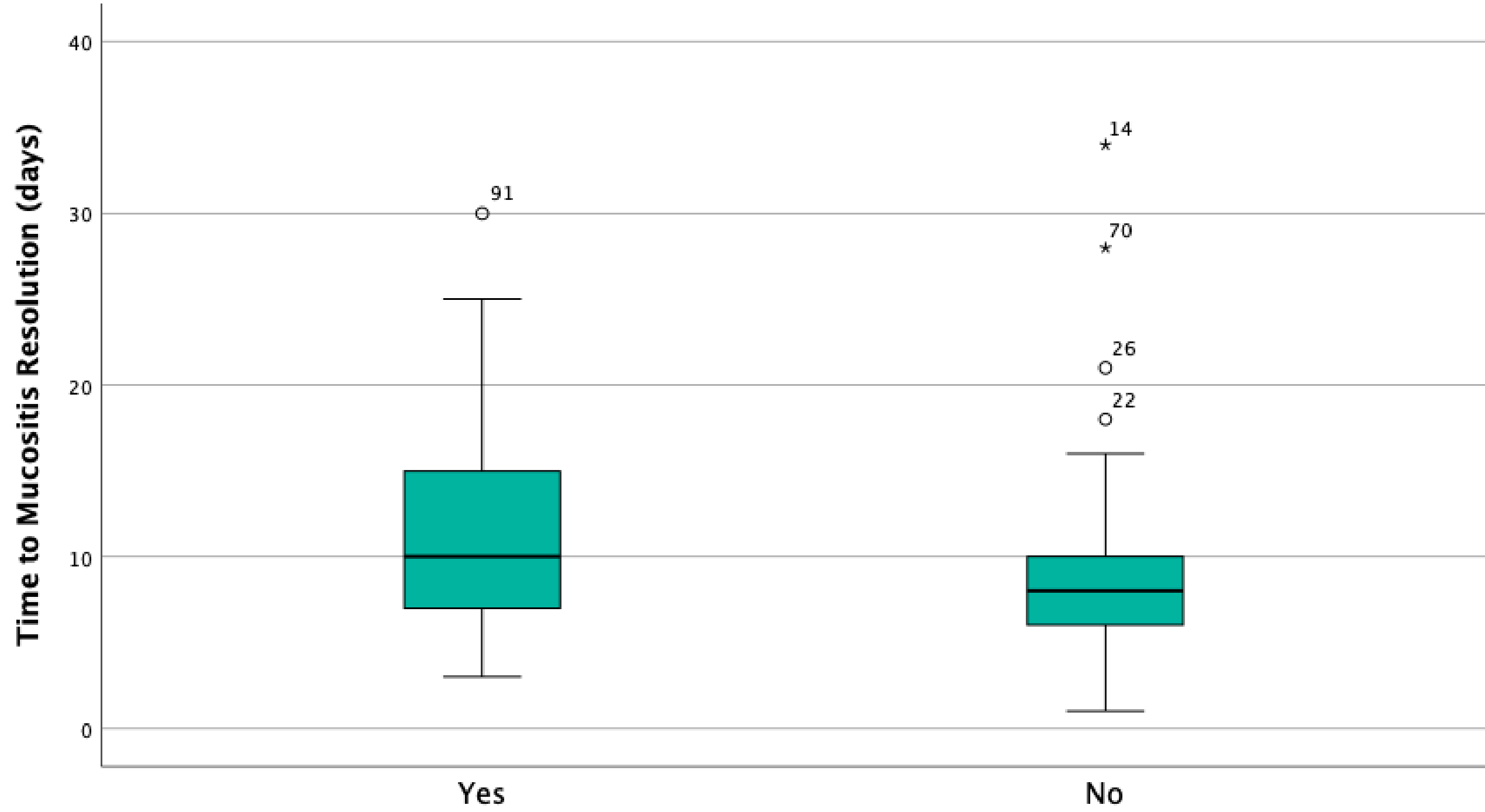


Figure 3. Box Plot: Time to Mucositis Resolution by Candida Infection

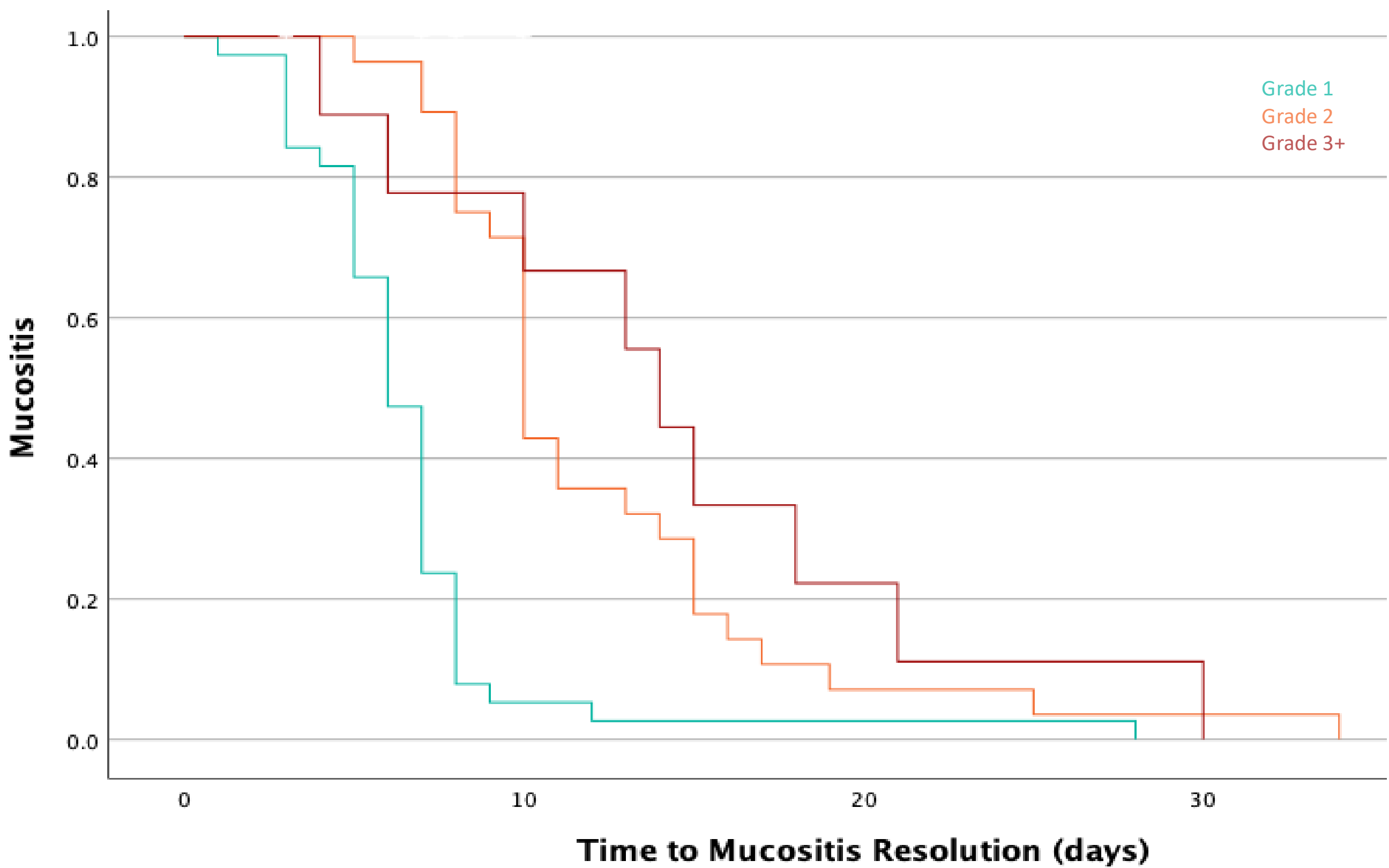


Figure 4. Kaplan-Meier Curve: Time to Mucositis Resolution

CONCLUSION

Key Findings

- PBM was associated with a **lower mucositis prevalence** compared to historical data
- Faster mucositis recovery:** Improved in 8 days, significantly shorter than the expected 46-60 days in patients undergoing HSCT, showcasing promising results for PBM efficacy

Clinical Implications

- PBM may be an **effective, non-invasive** treatment for reducing mucositis incidence and accelerating recovery, enhancing patient outcomes in HSCT
- Daily follow-up assessments**, including PBM, vitamin E, and oral care, could be integrated as a standard care protocol to **improve patient outcomes** and **reduce healthcare burden**

Limitations

- Single-center study, with limited generalizability
- Sample size may affect statistical power
- The study did not assess the long-term outcomes or quality of life post HSCT

Future Directions

- Larger, multicenter studies to validate PBM efficacy across diverse patient populations
- Investigate the role of Candida infection in mucositis development and recovery time
- Further research into optimal PBM treatment schedules and long-term effects

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