The Immunomodulating Effects of Arabinoxylan Rice Bran (Biobran) on Hematologic Profile, Nutritional Status and Quality of Life among Head and Neck Carcinoma Patients Undergoing Radiation Therapy: A Double Blind Randomized Control Trial

Primary Author D. Tan, J. Flores
M. Reyna, J. Canedo, E. Chiong, C. Yu, M. Calaguas, L. Rodriguez, J. Galingana, R. Marquez

Department of Radiotherapy, Jose R. Reyes Memorial Medical Center, Rizal Avenue, Sta Cruz, Manila, Philippines

Email address of Corresponding Author(s):
dotyfaye@gmail.com;jicksonfloresmd@gmail.com

BACKGROUND AND OBJECTIVE

Immunostimulants are currently being explored to reduce the complications of radiation/chemotherapy. This double blind randomized trial aims to determine the immunomodulating effects of Arabinoxylan Rice Bran (Biobran) among head and neck cancer patients in addressing radiation treatment complications such as anemia, leukopenia, weight loss and improvement of quality of life.

METHODS

65 patients were enrolled and given either Arabinoxylan Rice Bran (Biobran) or placebo, 2 weeks prior, during radiation/chemoradiotherapy, and 2 months after. Complete Blood Count (CBC), Body Mass Index (BMI), percent weight loss and EORTC Quality of Life questionnaires QLQ H&N35 were used to assess the degree of anemia, weight loss and quality of life.

RESULTS AND DISCUSSION

Overall CBC results revealed higher values on all parameters in Arabinoxylan Rice Bran (Biobran) arm. Upon completion of radiochemotherapy, Biobran arm showed significantly higher mean hemoglobin by 1.30 g/dL (p=0.010), hematocrit (p=0.001), RBC (p=0.001) and platelets (p=0.017). Also, higher overall BMI (22.69 versus 21.52) and a lower percent weight loss (6.10% versus 6.91%) for Biobran compared to placebo were noted with a p-values of 0.199 and 0.571, respectively. Treatment related toxicity using the RTOG grading showed lower severity scores on all parameters (p-values: >0.05) and better QoL scores for patients taking Biobran (p-value: 0.019).

CONCLUSIONS

Results from this study showed better clinical outcomes for patients taking Arabinoxylan Rice Bran (Biobran). These have led to fewer blood transfusions, treatment delays and hospital admissions, avoidance of treatment mortalities and morbidities and improved quality of life among head and neck cancer patients undergoing chemoradiotherapy.

ACKNOWLEDGMENTS AND ETHICS CLEARANCE

The authors would like to thank the staff of the Department of Radiotherapy, Jose R. Reyes Memorial Medical Center, Manila, Philippines. This paper is dedicated to all cancer patients who deserve quality and safe radiotherapy and care.

.

REFERENCES

[1] Cadoni G, Giraldi L, Petrelli L, et al. Prognostic factors in head and neck cancer: a 10-year retrospective analysis in a single-institution in ItalyFattori prognostici del tumore testa-collo: un'analisi retrospettiva monocentrica di 10 anni. *Acta Otorhinolaryngol Ital*. 2017;37(6):458-466.

[2] Harrison LB, Shasha D, Homel P (2003) Prevalence of anemia in cancer patients undergoing radiotherapy: prognostic significance and treatment. Oncology 63(suppl 2):11–18

[3] Shasha, D., Harrison, L: Anemia Treatment And the Radiation Oncologist: Optimizing Patient Outcomes. Review Article Cancer Network [ONCOLOGY 15:1486-1496, 2001

[4] Biobran MGN 3- Overview; http://www.biobran.org/overview/

[5] Lee WR, Berkey B, Marcial V, et al: Anemia is associated with decreased survival and increased locoregional failure in patients with locally advanced head and neck carcinoma: A secondary analysis of RTOG 85-27. Int J Radiat Oncol Biol Phys 42:1069-1075, 1998. –

[6] E.J. Hall, A.J. Giaccia. Radiobiology for the Radiologist. Lippincott Williams & Wilkins, Philadelphia (2006). pp. 29-32

[7] Mauch, P., Constine, L., Greenberger, J. et al, Hematopoietic stem cell compartment: Acute and late effects of radiation therapy and chemotherapy. *Int J Radiat Oncol Biol Phys*. 1995;31:1319–1339.

[8] Takahara K, Sano K. The life prolongation and QOL improvement effect of rice bran arabinoxylan derivative(MGN-3/Bio-Bran) for progressive cancer. Clin Pharmacol Ther 2004;14:267–71

[9] Biobran MGN 3- Overview; http://www.biobran.org/overview/

[10] Miura T, Chiba M, Miyazaki Y, Kato Y, Maeda H. Chemical structure of the component involved in immunoregulation. In: BioBran/MGN-3 (Rice Bran Arabinoxylan Coumpound): Basic and Clinical Application to *Integrative Medicine*. 2nd ed. Tokyo, Japan: BioBran Research Foundation; 2013:14-22.

[11] Ooi SL, McMullen D, Golombick T, Nut D and Pak SC: Evidence-based review of BioBran/MGN-3 arabinoxylan compound as a complementary therapy for conventional cancer treatment. Integr Cancer Ther. Oct 1–2017

[12] Masood AI, Sheikh R, Anwer RA. Effect of "Biobran MGN-3" in reducing side effects of chemotherapy in breast cancer patients. Professional Med J Feb 2013;20(1):013-016.

[13] Kaketani K. A case where an immunomodulatory food was effective in conservative therapy for progressive terminal pancreatic cancer. *Clin Pharmacol Ther*. 2004;14:273-279.

[14] Okamura Y. The clinical significance of modified arabinoxylan from rice bran (BioBran/MGN-3) in immunotherapy for cancer. *Clin Pharmacol Ther*. 2004;14:289-294.

[15] Gridley DS, Pecaut MJ, Miller GM et al. Dose and dose rate effects of whole-body gamma-irradiation: II. Hematological variables and cytokines. In Vivo 2001;15:209–16.
[16] Ghoneum, M, Badr El-Din, N, Fattah, et al: Arabinoxylan rice bran (MGN-3/Biobran) provides protection against whole-body γ-irradiation in mice via restoration of hematopoietic tissues Journal of Radiation Research, 2013, 54, 419–429 doi: 10.1093/jrr/rrs119 Advance Access Publication 3 January 2013
[17] Petrovics G, Szigeti G, Hamvas S, Máté Á, Betlehem J, Hegyi G. Controlled pilot study for cancer patients suffering from chronic fatigue syndrome due to chemotherapy treated with BioBran (MGN-3-Arabinoxylan) and targeted radiofrequency heat therapy. *Eur J Integr Med*. 2016;8:29-35.
[18] Ghoneum M (2016) From bench to bedside: The growing use of arabinoxylan rice bran (MGN-3/Biobran) in cancer immunotherapy. *Austin Immunology* 1: 1006–1013.