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Shashi Kanaujiya

Assistant Professor, Department of Physical Education, University of Lucknow, Uttar Pradesh, India

Vishnu Yadav

Department of Physical Education, University of Lucknow, Uttar Pradesh, India

Shailendra Kumar

Department of Thoracic Surgery, King George's Medical University, Lucknow, Uttar Pradesh, India

Mayank Jain

Department of Thoracic Surgery, King George's Medical University, Lucknow, Uttar Pradesh, India

Effect of yoga therapy on complete blood count of breast cancer patients: A comprehensive approach

Shashi Kanaujiya, Vishnu Yadav, Shailendra Kumar and Mayank Jain

Abstract

Introduction: Breast cancer shows the high prevalence and mortality among the women. The Integrating supplementary therapies like yoga has shown promise in enhancing the well-being and overall health outcomes of breast cancer patients. This study aims to explore the effects of yoga therapy on physiological indicators, including Red Blood Cell (RBC) count, White Blood Cell (WBC) count, and Bilirubin levels, in breast cancer patients during a 48-week intervention.

Materials and Methods: A cohort of 48 Stage II/III breast cancer patients undergoing radiotherapy and/or chemotherapy participated in the study. Certified yoga instructors conducted sessions comprising asanas. RBC count, WBC count, and Bilirubin levels were measured at baseline, 16 weeks, 32 weeks, and 48 weeks. Statistical analysis employed one-way ANOVA and Kruskal-Wallis tests.

Results: The study demonstrated a significant increase in RBC count in patients aged < 45 years from baseline to 48 weeks ($p < 0.0001$), suggesting potential positive effects of yoga therapy, particularly in younger patients. Bilirubin levels exhibited significant changes over time, with increases observed at 16 weeks, 32 weeks, and 48 weeks compared to baseline ($p < 0.001$). However, no significant changes in WBC count were observed during the intervention period.

Conclusion: Yoga therapy showed promising effects on Bilirubin levels, platelets and RBC count in breast cancer patients, particularly in the younger age group. These findings support the potential inclusion of yoga as a complementary approach in breast cancer management. The evidence supporting the potential role of yoga therapy in breast cancer care, offering prospects for improved health outcomes and enhanced quality of life for patients.

Keywords: Yoga therapy, complete blood count, breast cancer patients

Introduction

Breast cancer is a common and complex disease that not only has medical repercussions for individuals but also has significant emotional and psychological consequences^[1]. Integrating supplemental therapies, such as yoga, has shown promise in lowering treatment-related side effects, reducing stress, improving quality of life, and improving overall health outcomes in people with breast cancer^[2]. Understanding the potential effects of yoga therapy on certain physiological indicators, such as the complete blood count (CBC), is critical in developing comprehensive breast cancer management strategies.

Yoga, an ancient Indian discipline with roots reaching back more than two millennia, combines aspects such as physical postures (asanas), breathing methods (pranayama), relaxation, and meditation^[3]. This approach's complete framework includes different areas such as ethical behavior, personal conduct, physical postures, breath regulation, sensory inhibition, focus, integration, and meditation^[4]. Yoga has been studied for its therapeutic usefulness in a variety of medical disorders, including cancer, stress, sleeplessness, obesity, anxiety, diabetes, hypertension, and cardiovascular disease. Yoga practicing has been linked to improved general well-being, a decrease in self-reported symptoms, and a positive influence on biomarkers, according to research. Additionally studies reported practice of yoga affects the biochemical parameters of the individuals^[5-7]. Nonetheless, the effect of this medication on complete blood count (CBC) characteristics, particularly in women with breast cancer, has not been thoroughly studied^[8].

Yoga as a supplementary therapeutic modality in conjunction with conventional treatments provides a holistic approach to breast cancer management and general wellbeing development^[9].

Corresponding Author:

Shashi Kanaujiya

Assistant Professor, Department of Physical Education, University of Lucknow, Uttar Pradesh, India

However, more meticulously planned studies are needed to establish the efficacy of yoga interventions, gain a comprehensive understanding of the underlying mechanisms at work, and determine the best yoga practices for individuals diagnosed with breast cancer.

The goal of this study is to use a comprehensive methodology to investigate the impact of yoga therapy on the complete blood count (CBC) parameters in individuals with breast cancer. Using a thorough examination of various yoga practices such as asanas, Sukshma Vyayama exercises, pranayama techniques, and relaxation postures. The observations will be very useful in furthering our understanding of the physiological effects of yoga treatment and its potential contribution to improving hematological changes and general wellbeing in people with breast cancer.

Material and Methods

Subject selection: This study has been approved by the institutional ethics committee 111th ECM-Ph.D./P3. The patients underwent evaluation based on predetermined criteria for inclusion and exclusion. The study's inclusion criteria encompassed individuals between the ages of 30-65 years who had been diagnosed with stage II or III breast cancer, were undergoing both radiotherapy and chemotherapy treatments, and were deemed suitable candidates for yogic interventions. The exclusion criteria included pregnant women, individuals with significant gynaecological disorders, patients with a second malignancy or using alternative medicine, individuals who were unwilling to participate, patients with co-existing conditions such as cardiac disease or hepatic disorder, and individuals over the age of 65. The enrollment of eligible patients occurred subsequent to the completion of a written informed consent process.

A cohort of 48 patients diagnosed with Stage II/III breast cancer and receiving radiotherapy and/or chemotherapy were recruited from the Outpatient Department (OPD) of Endocrine Surgery and Surgery. The patients who were registered in the study underwent a treatment regimen consisting of chemotherapy and/or radiotherapy, supplemented with additional yogic interventions, for a period of 48 weeks. The researchers analysed the patients' complete blood count by examining the clinical reports obtained from each individual at various time points, namely baseline, 16 weeks, 32 weeks, and 48 weeks.

Yoga session: In the yoga cohort, individuals received instruction and oversight from a certified yoga instructor to ensure accurate and proficient performance of the various yogic asanas. The yoga sessions comprised a sequence of distinct asanas and pranayama techniques. The yoga routine consisted of various exercises and poses, such as Sukshma Vyayama for a duration of 7 minutes, Tadasana for 2 minutes, Kati Chakrasana for 2 minutes, Padadhirasana for 3 minutes, Tiryaka Tadasana for 2 minutes, Hridaya Mudra for 2 minutes, Gomukhasana for 3 minutes, Nadi Shodhana Pranayama for 3 minutes, Bhramari Pranayama for 2 minutes, Ujjayi Pranayama, and Shavasana for 5 minutes. Furthermore, the intervention encompassed the incorporation of additional practices, namely meditation, 10 minutes of Om chanting, and 30 minutes of Yoga Nidra, performed on alternating days.

Throughout the duration of the treatment, a comprehensive case sheet has been diligently maintained in order to assess and monitor the patients' progress. In order to ensure compliance with the yoga regimen, participants were subjected to remote monitoring via video calls, which served

the purpose of verifying the completion of assigned tasks and maintaining a comprehensive record of daily activities. Patients were advised to maintain a regular practice of the prescribed yoga routine at their place of residence for a duration of five days per week. The patients were requested to complete weekly practice and session forms, and the yoga sessions were supervised via phone calls and video calls to offer essential guidance and assistance.

Results

Impact of Yoga on Red Blood Cells (RBCs)

The statistical analysis of the haematocrit levels in breast cancer patients undergoing yoga therapy indicated a highly significant increase in RBCs from baseline to 48 weeks ($p < 0.0001$) in patients aged < 45 years. This significant variation suggests a positive effect of yoga therapy on RBC levels in younger patients with breast cancer.

However, the differences in RBC levels between baseline and 16 weeks, baseline and 32 weeks, and among the different intervals within the 48-week period were not statistically significant ($p > 0.05$).

These findings demonstrate that the implementation of yoga therapy, in conjunction with conventional cancer treatments, may lead to a significant improvement in RBC levels over an extended period, particularly in breast cancer patients below the age of 45 years.

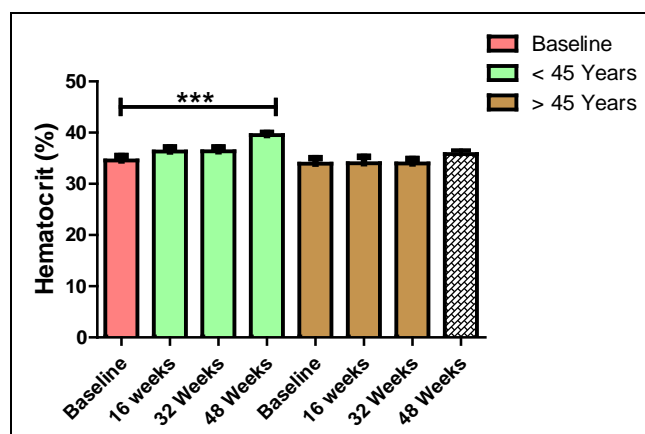


Fig 1: Percentage of haematocrit at two different age group

Influence of Yoga on White Blood Cells (WBCs)

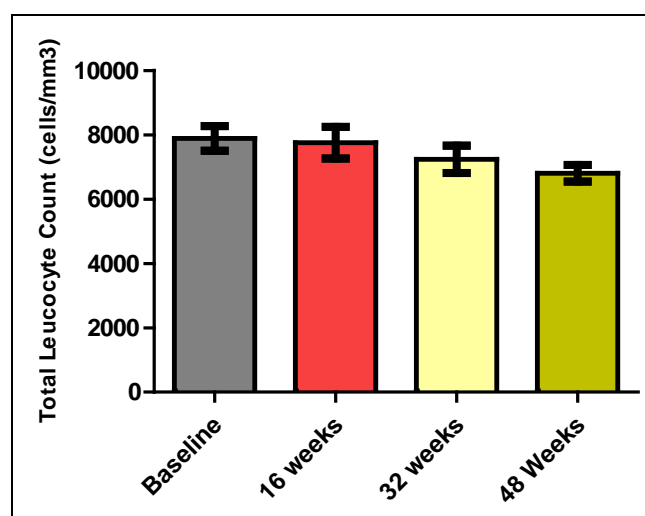


Fig 2: Total Leucocytes count at different interval after yoga therapy

The statistical analysis suggests that yoga therapy did not

have a significant influence on the Total Leucocyte Count (TLC) in breast cancer patients ($P = 0.2761$) at various time points during the 48-week yoga therapy intervention. The lack of significant variation in TLC levels over time suggests that the yoga therapy may not have a substantial impact on WBC levels in breast cancer patients, in the context of the TLC measurements analysed in this study.

Yoga's Effect on Platelet Count

The statistical analysis revealed a significant difference in variances of platelet count measurements among the different time intervals, indicating variability in platelet count responses to yoga therapy. The ANOVA results also showed a significant difference in platelet count between baseline and 48 weeks, suggesting a potential effect of yoga therapy on platelet count at 48 weeks ($P = 0.002$).

However, no significant differences were observed between baseline and 16 weeks or between baseline and 32 weeks. This suggests that any potential impact on platelet count may require a longer duration of yoga therapy to become evident.

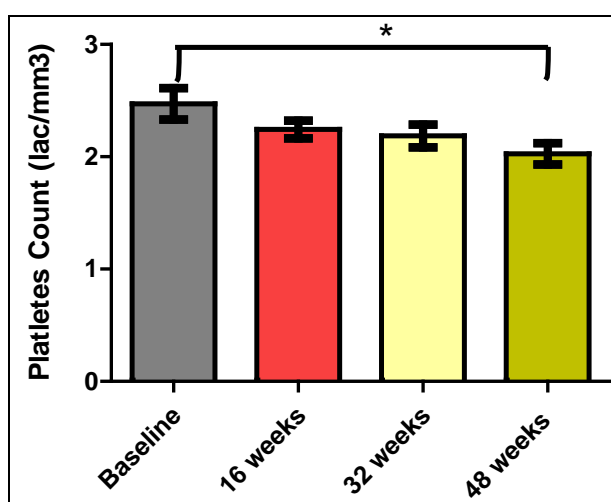


Fig 3: Platelets count after yoga therapy

Bilirubin Underlying Yoga's Effects

The statistical analysis demonstrated that yoga therapy had a significant effect on Bilirubin levels in breast cancer patients. The observed variability in Bilirubin responses and the significant differences between baseline and subsequent time points ($p < 0.001$) suggest that yoga therapy may influence Bilirubin metabolism or liver function in breast cancer patients.

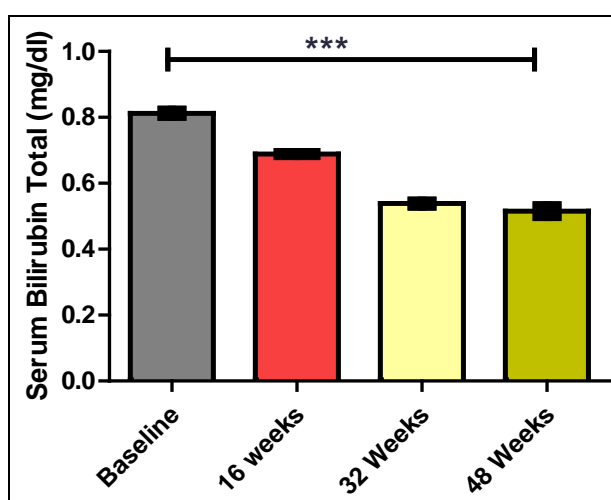


Fig 4: Serum Bilirubin after yoga therapy

Discussion

The present study aimed to investigate the potential effects of yoga therapy on physiological indicators, specifically Red Blood Cell (RBC) count, White Blood Cell (WBC) count, and Bilirubin levels, in breast cancer patients over a 48-week intervention period. The results shed light on the impact of yoga as a complementary therapeutic modality in breast cancer management.

The findings pertaining to RBC count demonstrated a significant increase from baseline to 48 weeks in patients aged < 45 years. This observation suggests that yoga therapy positively influence RBC levels, particularly in the younger age group. The increase in RBC count attributed to the various components of yoga, such as physical postures (asanas) and pranayama techniques, which can enhance blood circulation and oxygenation and upregulate the blood lipid indicator in the blood [10, 11]. However, the lack of significant changes at earlier time points (16 weeks and 32 weeks) indicates that the effect on RBC count may require sustained practice of yoga over an extended period [12, 13]. Additionally, the Sudarshan kriya have the potential to regulate the haematological parameters [14, 15].

Regarding WBC count, the study did not reveal any significant changes during the 48-week intervention. It is noteworthy that the lack of statistical significance may be due to various factors, including the small sample size or the complex interplay of yoga's effects on immune function [16]. Although, literature reports training of yoga with a supplement therapy positively modified the leucocytes cell survival related genes [17]. In addition, the longer intervention period significantly improves the total leukocytes count in the diseases individual [18].

The investigation into Bilirubin levels revealed a highly significant difference in variances among the different time intervals, indicating notable variability in Bilirubin responses to yoga therapy. Moreover, statistically significant increases in Bilirubin levels were observed at 16 weeks, 32 weeks, and 48 weeks compared to baseline. These findings suggest that yoga therapy positively influence Bilirubin metabolism or liver function in breast cancer patients [19, 13].

The liver plays a vital role in metabolizing Bilirubin, a product of heme degradation. Elevated Bilirubin levels are often associated with impaired liver function or bilirubin clearance, which have clinical implications [20, 21]. The observed increases in Bilirubin levels throughout the intervention period suggest that yoga therapy contribute to enhanced liver function or improved Bilirubin metabolism in breast cancer patients [22].

While the precise mechanisms underlying yoga's effects on Bilirubin levels remain to be fully elucidated, certain aspects of yoga practice could be involved. Yoga's emphasis on physical postures, breathing techniques, and relaxation may promote blood circulation and oxygenation, potentially supporting liver function and bilirubin clearance [23]. Additionally, stress reduction through yoga practices may contribute to improved liver health, as chronic stress has been associated with liver dysfunction in some studies [24].

Overall, this study provides valuable insights into the potential physiological effects of yoga therapy in breast cancer patients. The positive outcomes related to RBC count and Bilirubin levels highlight the potential benefits of incorporating yoga as a supplementary modality in breast cancer management. However, it is essential to acknowledge certain limitations, including the relatively small sample size and the focus on specific physiological indicators. Future

research should adopt randomized controlled trials with larger sample sizes and longer intervention periods to validate and expand upon these findings.

Conclusion

This study contributes to our comprehension of the potential physiological implications of yoga therapy in breast cancer patients. The favourable findings for RBC count, Bilirubin levels, and platelet percentage indicates that yoga improves breast cancer patients' health and treatment outcomes. The findings pave the way for yoga to be considered as an adjuvant therapy in comprehensive breast cancer management, with the potential to improve overall health outcomes and well-being in breast cancer patients.

Future Directions

Long-term follow-up studies, Random Control Trials with larger sample numbers, diversified biomarker analyses, clinical outcomes and mechanisms research, such study efforts will help us gain a better understanding of yoga's potential involvement in enhancing health outcomes and well-being in breast cancer patients.

References

- Mohammad A, Thakur P, Kumar R, Kaur S, Saini RV, Saini AK. Biological markers for the effects of yoga as a complementary and alternative medicine. *Journal of complementary & integrative medicine*. 2019;16(1):30735481.
- Gosain R, Gage-Bouchard E, Ambrosone C, Repasky E, Gandhi S. Stress reduction strategies in breast cancer: review of pharmacologic and non-pharmacologic based strategies. *Seminars in immunopathology*. 2020;42(6):719-34.
- Zetl T, Renner A, Pittig A, Jentschke E, Roch C, Van Oorschot B. Yoga effectively reduces fatigue and symptoms of depression in patients with different types of cancer. *Supportive care in cancer: official journal of the Multinational Association of Supportive Care in Cancer*. 2021;29(6):2973-82.
- Rashedi RN, Rowe SE, Thompson RA, Solari EJ, Schonert-Reichl KA. A Yoga Intervention for Young Children: Self-Regulation and Emotion Regulation. *Journal of child and family studies*. 2021;30(8):2028-41.
- Mangala Gowri M, Rajendran J, Srinivasan AR, Bhavanani AB, Meena R. Impact of an Integrated Yoga Therapy Protocol on Insulin Resistance and Glycemic Control in Patients with Type 2 Diabetes Mellitus. *Rambam Maimonides medical journal*. 2022;13(1):35089124.
- Madanmohan, Bhavanani AB, Dayanidy G, Sanjay Z, Basavaraddi IV. Effect of yoga therapy on reaction time, biochemical parameters and wellness score of peri and post-menopausal diabetic patients. *International journal of yoga*. 2012;5(1):10-5.
- Luo J, Zheng B. Effect of yoga combined with aerobic exercise intervention on morphological and blood lipid indicators in female college students. *The Journal of sports medicine and physical fitness*. 2020;60(3):442-8.
- Sengupta P. Health Impacts of Yoga and Pranayama: A State-of-the-Art Review. *International journal of preventive medicine*. 2012;3(7):444-58.
- Cramer H, Lauche R, Klose P, Lange S, Langhorst J, Dobos GJ. Yoga for improving health-related quality of life, mental health and cancer-related symptoms in women diagnosed with breast cancer. *The Cochrane database of systematic reviews*. 2017;1(1):CD010802.
- Woodyard C. Exploring the therapeutic effects of yoga and its ability to increase quality of life. *International journal of yoga*. 2011;4(2):49-54.
- Azami M, Hafezi Ahmadi M, YektaKooshali M, Qavam S. Effect of yoga on lipid profile and c-reactive protein in women. *International journal of preventive medicine*. 2019;10(1):81.
- Bizjak DA, Tomschi F, Bales G, Nader E, Romana M, Connes P, *et al*. Does endurance training improve red blood cell aging and hemorheology in moderate-trained healthy individuals? *Journal of sport and health science*. 2020 Dec;9(6):595-603.
- Rao RM, Nagendra HR, Raghuram N, Vinay C, Chandrashekara S, Gopinath KS, *et al*. Influence of yoga on mood states, distress, quality of life and immune outcomes in early stage breast cancer patients undergoing surgery. *International journal of yoga*. 2008;1(1):11-20.
- Zope SA, Zope RA. Sudarshan kriya yoga: Breathing for health. *International journal of yoga*. 2013;6(1):4-10.
- Subramanian S, Elango T, Malligarjunan H, Kochupillai V, Dayalan H. Role of sudarshan kriya and pranayam on lipid profile and blood cell parameters during exam stress: A randomized controlled trial. *International journal of yoga*. 2012;5(1):21-7.
- McKenzie FE, Prudhomme WA, Magill AJ, Forney JR, Permpnich B, Lucas C, *et al*. White blood cell counts and malaria. *The Journal of infectious diseases*. 2005;192(2):323-30.
- Khedmati Zare V, Javadi M, Amani-Shalamzari S, Kaviani M. The high dose of vitamin D supplementation combined with yoga training improve the leukocytes cell survival-related gene expression in breast cancer survivors. *Nutrition & metabolism*. 2021;18(1):80.
- Qu S, Olafsrud SM, Meza-Zepeda LA, Saatcioglu F. Rapid gene expression changes in peripheral blood lymphocytes upon practice of a comprehensive yoga program. *PloS one*. 2013;8(4):e61910.
- Danhauer SC, Addington EL, Sohl SJ, Chaoul A, Cohen L. Review of yoga therapy during cancer treatment. *Supportive care in cancer: official journal of the Multinational Association of Supportive Care in Cancer*. 2017;25(4):1357-72.
- Sticova E, Jirsa M. New insights in bilirubin metabolism and their clinical implications. *World journal of gastroenterology*. 2013;19(38):6398-407.
- Guerra Ruiz AR, Crespo J, Lopez Martinez RM, Iruzubieta P, Casals Mercadal G, Lalana Garces M, *et al*. Measurement and clinical usefulness of bilirubin in liver disease. *Advances in laboratory medicine*. 2021;2(3):352-72.
- Lahart IM, Metsios GS, Nevill AM, Carmichael AR. Physical activity for women with breast cancer after adjuvant therapy. *The Cochrane database of systematic reviews*. 2018;1(1):CD011292.
- Balaji PA, Varne SR, Ali SS. Physiological effects of yogic practices and transcendental meditation in health and disease. *North American journal of medical sciences*. 2012;4(10):442-8.
- Stephens I. Medical Yoga Therapy. *Children*. 2017;10(4):28208599.