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Effect Of Vitamin D And Calcium Supplementation on Quality of Life and Tumour Response in Stage II/III Breast Cancer Receiving Neoadjuvant Chemotherapy: a Randomized Control Trial

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Introduction

- Vitamin D in various forms, is known for its importance at multiple levels of carcinogenesis. Vitamin D also possesses anti-oxidative stress, anti-invasion, anti-angiogenesis, and anti-proliferative effects.
- Additionally, effects of a few anti-neoplastic drugs, such as anthracyclines and taxanes, are enhanced by vitamin D's synergistic effects on their ability to inhibit tumor growth.
- On the other hand neoadjuvant chemotherapy (NACT) worsens vitamin D insufficiency.

Methods

- A Randomized Controlled study was performed which included Stage II/III breast cancer cases receiving NACT (n=35 patients without calcium and Vitamin D supplementation and n=35 patients with supplementation)) from 2021 to 2022.
- Comparison for quality of life using FACT-G questionnaire, Neutrophil/Lymphocytes ratio (NLR) and clinical response (CR) were analysed between the groups.

Results

- **Physical, social and total quality of life** was significantly higher ($p < 0.05$) in Group 2 (supplemented).
- There was no significant difference in functional and emotional wellbeing between two groups.
- **Pretreatment Neutrophil to lymphocyte ratio (NLR)** in Group 1 (non-supplemented) was 2.24 and in Group 2 (supplemented) was 2.97; whereas **Post treatment NLR** in group 1 (and group 2 were 2.21 and 2.63 respectively – statistically significant ($p < 0.05$) in group 2.
- **Clinical tumor response** was present in 91% of group 1(non-supplemented) and 94.29 % of group 2 (supplemented); Pathological complete response (pCR) was present in only 2.86% of non-supplemented group and 5.7 % of supplemented group.

Conclusion

- Vitamin D and calcium supplementation has a potential role in achieving higher clinical tumor response and higher rates of pathological complete response (pCR).

- Vitamin D and calcium supplementation also causes significant fall in NLR. In context with QoL, VitD and Calcium supplementation exerts many significant effects on physical, social aspects and total quality of life.