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Research Article

Comparative Evaluation Of Chemotherapy-Induced Neutropenia In Weekly Versus Three-Weekly Paclitaxel Regimens Among Breast And Ovarian Cancer Patients: An Ambispective Study

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ABSTRACT

Breast cancer and ovarian cancer are among the most common malignancies affecting women worldwide and frequently require systemic chemotherapy for disease control. Paclitaxel is a widely used chemotherapeutic agent that exerts its antitumor activity by stabilising microtubules and inhibiting cell division; however, its use is commonly associated with chemotherapy-induced neutropenia, a significant haematological toxicity that may lead to treatment delays, dose reductions, infections, and compromised treatment outcomes. Different dosing schedules of paclitaxel may influence the severity of this toxicity. The present ambispective comparative study was conducted to evaluate and compare the incidence and severity of paclitaxel-induced neutropenia among breast and ovarian cancer patients receiving weekly and three-weekly paclitaxel regimens. A total of 102 female patients were included in the study conducted at the Department of Oncology, DDH Renova Cancer Centre, Hyderabad, with 51 patients receiving weekly paclitaxel (50–80 mg/m²) and 51 patients receiving three-weekly paclitaxel (175 mg/m²). Data were collected from patient case records, laboratory reports, and treatment charts. Absolute Neutrophil Count (ANC) was used as the primary parameter for assessing neutropenia severity, while White Blood Cell (WBC) count served as a secondary haematological parameter. Statistical analysis was performed using appropriate comparative tests, including the Mann–Whitney U test, unpaired t-test, Chi-square/Fisher's exact test, and Cox regression analysis. The study demonstrated that the three-weekly paclitaxel regimen was associated with significantly lower ANC and WBC values and a higher incidence of Grade 3/4 neutropenia compared with the weekly regimen, indicating greater haematological toxicity with three-weekly administration.

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INTRODUCTION

Cancer is an uncontrolled growth of abnormal cells, usually from a single cell that lost normal regulation. These cells multiply continuously, invade nearby tissues, spread to distant body parts, and stimulate new blood vessel growth for nourishment. Malignant cells can arise from any body tissue, forming a tumor that damages surrounding tissue (1).

Breast cancer is a condition in which breast cells proliferate uncontrollably to produce tumors that can spread (metastasis) to other regions of the body, usually beginning in the lobules or milk ducts. Most breast cancers originate in the ductal epithelium (ductal carcinoma) or lobules (lobular carcinoma) (2).

The two ovaries are reproductive organs located on opposing sides of the uterus. The ovaries include a variety of cells, including surface epithelial cells, germ cells, and sex-cord stromal cells. The ovaries contain eggs, which are released once a month during ovulation. The ovaries produce the hormones estrogen and progesterone. Ovarian cancer occurs when the ovary's cells expand uncontrollably and create tumours (3) .

Paclitaxel is the most widely used standard treatment for both the cancers. Paclitaxel inhibits microtubule depolymerization by binding to the β-tubulin subunit of microtubules and promoting and maintaining their polymerization. The normal dynamic remodeling of the microtubule network necessary for the production of mitotic spindles during cell division is blocked by this hyperstabilization, which results in arrest during the G2/M phase and apoptosis (4).

This use of paclitaxel has main effect - Chemotherapy induced Neutropenia (typically Grade 3/4) where it deviates medication adherence. Chemotherapy-induced neutropenia (CIN) is a significant haematological toxicity that limits chemotherapy dosing and can impact treatment plans, potentially compromising disease control and patient survival (5).

2. MATERIALS AND METHODS:

This was a single-centre, Non-randomised, Ambispective, Comparative study conducted in Department of Oncology, DDH Renova cancer centre, Hyderabad. The study was conducted over a period of six months of duration with the sample size of 102 patients diagnosed with Breast or Ovarian cancer.

Dosage Regimen

- Weekly Paclitaxel - 50 - 80 mg/m^2 x 1 Week
- 3- weekly Paclitaxel - 175 mg/m^2 x 1 cycle

Inclusion Criteria

- Female patients aged >= 18 years of age.
- Patients with ECOG performance status 0-2.
- Patients receiving paclitaxel as either weekly or 3 weekly regimen.
- Patients of breast and ovarian cancer.

Exclusion Criteria

- Patients of <18 years of age.
- Patients receiving NAB Paclitaxel.
- Patients with Grade >=2 of peripheral neuropathy.
- Pregnant or Breast feeding are excluded.
- Patients with paclitaxel allergy.

Data Collection

All the necessary data like Complete blood picture , Neutrophil count, WBC count were collected from patient record and laboratory record.

Statistical Analysis

Data were entered into Microsoft Excel and were analysed using statistical software. Data were summarised using counts (%) for categorical data, mean ±SD for continuous normal data, and median ±IQR for continuous non-normal or ordinal data. The Mann Whitney U test for continuous non-normal or ordinal data and the unpaired t test for continuous normal data was used to compare the two groups. The chi-square test or Fisher's exact test for categorical data was used to compare two groups or determine the relationship between variables. Cox Regression analysis was used to get the Hazard Ratio. Any p-value below 0.05 regarded as statistically significant.

3. RESULTS AND DISCUSSION

This study involved 102 participants out of which 51 patients were with Breast cancer and other 51 with ovarian cancer. The patients were divided into two groups based on dosing schedule Weekly and 3-weekly using. Absolute Neutrophil Count is used as the main parameter for evaluating haematological toxicity called Neutropenia.

The study participants were having mean age group of 53.59 ±11.00 years, where most of the participants (45%) coming under 45 - 60 years age group.

Considering the Absolute Neutrophil Count values, showed a differences in haematological impact with a P value of <0.001 in both weekly and 3-weekly groups. 3- weekly group showed mean Absolute Neutrophil Count value to be 0.47673 Thousand/mm³ and standard deviation of 0.407779. While the weekly group had shown the ANC mean value of 1.01938 Thousand/mm³ and standard deviation of 0.376448.

Considering the total White Blood Cell values, 3-weekly group showed mean White Blood Cell value to be 0.9404 cells/cumm and standard deviation of 0.76697. While the weekly group had shown higher mean value of 1.8774 cells/cumm and a standard deviation of 0.72624, with a significant P value of <0.001.

Among the two groups the severity of neutropenia was statistically analysed. Here, the 3-weekly group has comprised of 89.2% cases of more severe neutropenia profile, while the weekly group was associated with 83.8% cases of mild severity neutropenia profile. On statistical analysis, dosing schedule showed significant P values (<0.001), which indicates 3-weekly group is associated with increased risk of more severe neutropenia.

A multivariable Cox regression model was constructed to adjust for potential confounding variables, including cancer type. After adjustment, the paclitaxel dosing schedule remained an independent predictor of chemotherapy-induced neutropenia, indicating that the observed association was not explained by concomitant carboplatin administration.

4. CONCLUSION

This ambispective study explored effects of Paclitaxel drug over 102 participants. Among 102 participants 51 are of Breast cancer and other half included ovarian cancer. Participants are compared with weekly vs 3-weekly dosing schedule.

The results showed that compared to weekly group, 3- weekly group had an increased risk of more severe neutropenia.

3-weekly group encountered Grade 3 and Grade 4 neutropenia more commonly, which indicates more bone marrow suppression. On the other

hand, weekly group encountered lesser incidence of severe neutropenia featuring more safety profile.

Even though both regimens are equally successful in treating cancer, the greater toxicity associated with the 3-weekly regimen emphasizes the significance of close patient care and observation. In light of the danger of neutropenia, weekly paclitaxel may be a safer option, especially for those who are more susceptible to haematological problems.

All things considered, the findings of this study support the theory that a 3-weekly paclitaxel dose causes more severe neutropenia than a weekly dose. It also emphasized the significance of customised treatment planning to get the greatest results with the fewest side effects.

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REFERENCES

1. Gale, R. P. (2024, September). Overview of Cancer. In MSD Manual Consumer Version. Merck & Co., Inc. Retrieved from https://www.msdmanuals.com/home/cancer/overview-of-cancer/overview-of-cancer
2. Łukasiewicz S, Czeczelewski M, Forma A, Baj J, Sitarz R, Stanisławek A. Breast Cancer-Epidemiology, Risk Factors, Classification, Prognostic Markers, and Current Treatment Strategies-An Updated Review. Cancers (Basel). 2021 Aug 25;13(17):4287. Doi: 10.3390/cancers13174287. PMID: 34503097; PMCID: PMC8428369.
3. Johns Hopkins Medicine. Ovarian Cancer [Internet]. Baltimore (MD): Johns Hopkins Medicine; [cited 2026 Jul 11]. Available from: https://www.hopkinsmedicine.org/health/conditions-and-diseases/ovarian-cancer
4. Kumar S, Mahdi H, Bryant C, Shah JP, Garg G, Munkarah A. Clinical trials and progress with paclitaxel in ovarian cancer. Int J Womens Health. 2010 Nov 19;2:411-27. doi: 10.2147/IJWH.S7012. PMID: 21270965; PMCID: PMC3024893.
5. Current management of chemotherapy-induced neutropenia in adults: key points and new challenges: Committee of Neoplastic Supportive-Care (CONS), China Anti-Cancer Association Committee of Clinical Chemotherapy, China Anti-Cancer Association. Cancer Biol Med. 2020 Nov 15;17(4):896-909. Doi: 10.20892/j.issn.2095-3941.2020.0069. Epub 2020 Dec 15. PMID: 33299642; PMCID: PMC7721096.

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