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RESEARCH ARTICLE

A Comparative Assessment of Symptom Burden in Platinum-Induced Peripheral Neuropathy at a Tertiary Care Hospital in Chennai, Southern India

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Abstract

Introduction: Peripheral neuropathy (PN) is a clinically significant and dose-limiting adverse effect of platinum-based chemotherapy regimens. It can impair patients' quality of life and may necessitate dose modification or treatment discontinuation. This study aims to compare the symptom burden of PN among patients receiving these regimens and to identify which platinum-based regimen is most strongly associated with higher symptom severity, to facilitate early implementation of preventive measures to reduce symptom burden in future patients. **Materials and Methods:** This six-month observational study at a tertiary care hospital in Chennai included 108 cancer patients receiving platinum-based regimens. Peripheral neuropathy was assessed using the EORTC QLQ-CIPN20. Data were analyzed using SPSS and Python. Group differences were evaluated using Mann–Whitney U or Kruskal–Wallis tests with Dunn's post hoc test with Bonferroni correction, and ordinal logistic regression was used for univariate and multivariate analyses. A p-value <0.05 was considered significant. **Results:** The overall symptom burden among the study population (N = 108) demonstrated a mean total score of 43.9 ± 19.33, with a median of 42.49 (IQR 28.25), indicating a moderate burden. Symptom burden scores were significantly different among the three platinum drug groups (p = 0.043), with higher scores in patients receiving carboplatin-based regimens. Regimens that included paclitaxel caused a notably higher symptom burden (p = 0.007). There were also significant differences across different regimens (p = 0.003), with the paclitaxel–carboplatin (PC) regimen showing the highest burden, likely due to the combined neurotoxic effects of both drugs. **Conclusion:** This study highlights the importance of early implementation of neuroprotective interventions in patients receiving the paclitaxel–carboplatin (PC) regimen, given its association with the highest neuropathy burden. The findings underscore the value of regimen selection and individualized supportive care strategies to minimize symptom burden and preserve patients' quality of life.

Keywords: Paclitaxel–carboplatin, Paclitaxel–carboplatin induced peripheral neuropathy, Peripheral Neuropathy

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Introduction

Cancer remains one of the leading causes of morbidity and mortality worldwide, posing a major public health challenge despite significant advancements in diagnosis and treatment. Characterized by the uncontrolled growth and spread of abnormal cells, cancer can occur in any part of the body and encompasses more than 100 distinct origins, each with its own etiology, behavior, and prognosis (World Health Organization [WHO], 2022). Early detection, improved therapeutic strategies, and heightened public awareness are critical components in reducing the impact of cancer on individuals and healthcare systems alike [1]. While public awareness of cancer has significantly increased over the years, many individuals remain unaware of the burden of certain side effects, a common consequence of cancer and its treatment [2].

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Peripheral neuropathy (PN) is an inconsistently addressed, often debilitating side effect of several chemotherapeutic agents, especially platinum-based compounds such as cisplatin, carboplatin, and oxaliplatin. These agents are widely used in the treatment of solid tumors, including ovarian, lung, colorectal, and testicular cancers, due to their cytotoxic efficacy [3]. Platinum-induced peripheral neuropathy (PIPN) is characterized by numbness, tingling, burning sensations, muscle weakness, difficulty walking, dizziness, pain in a glove-and-stocking distribution, etc [4]. This significantly impairs patients' quality of life and may lead to dose reductions or discontinuation of treatment, thus affecting overall therapeutic outcomes [5]. The symptom burden of PIPN may vary based on the specific drug, cumulative dose, treatment duration, and individual patient factors such as age, diabetes, pre-existing neuropathy, etc [6]. Despite its high prevalence and clinical importance, PIPN often lacks timely preventive intervention in routine clinical practice.

While there is growing literature on the incidence and mechanisms of PIPN, limited studies have compared the symptom burden across different platinum regimens. This gap in knowledge restricts the development of targeted preventive and management strategies [7].

The objective of this study is to assess the symptom burden of PIPN in cancer patients and to identify the platinum-based regimen associated with the highest symptom burden, and to determine the influence of patient-related factors (e.g., age, comorbidities) and treatment-related factors (e.g., cumulative dose, duration) on the neuropathic symptoms.

Materials and Methods

Study design and setting

This prospective observational study was carried out over six months, from January 2025 to June 2025, at a single-centre tertiary care hospital in Chennai. Participants were monitored as part of their routine clinical care, with no interventions or modifications to treatment protocols.

Study population

A total of 108 participants aged 18 years and above were enrolled, each with a confirmed diagnosis of cancer of any primary site, receiving a platinum-based chemotherapy regimen, and developing peripheral neuropathy (PN).

Exclusion criteria included patients under the age of 18, those receiving non-platinum chemotherapy, individuals with non-chemotherapy-related PN due to other known causes (e.g., diabetic or alcoholic neuropathy), those with incomplete diagnostic or treatment data, and patients who declined to provide informed consent. Some participants were lost to follow-up (n = 2), withdrew from treatment (n = 3), or were deceased during the study period (n = 3); these participants were not included in the final study sample of 108 patients, thus not affecting the study.

Sample Size Determination and Sampling

The sample size was estimated based on medical expert consensus, assuming an expected outcome proportion of 20% of peripheral neuropathy (PN) within the study. Using standard sample size calculation methods for observational studies, with a 95% confidence interval, 5% margin of error (0.05), and an expected proportion of PN at 20%, the required sample size was calculated to be 97 participants. To account for a projected 10% attrition rate (due to possible withdrawal or loss to follow-up), the final target sample size was adjusted to 108 participants to ensure statistical validity.

An a priori power analysis was performed to ensure sufficient statistical precision and robustness of the results. A stratified sampling approach was employed to achieve proportional representation across the three platinum drugs: cisplatin, carboplatin, and oxaliplatin, with 36 participants allocated to each subgroup. Figure 1 outlines the process of participant eligibility screening, application of inclusion and exclusion criteria, reasons for exclusion, and the final enrollment of participants into the study.

Chemotherapy Treatment

Patients received platinum-based chemotherapy regimens according to institutional protocols, including nab-paclitaxel–carboplatin (Nab-PC), paclitaxel–carboplatin (PC), docetaxel–carboplatin–5-fluorouracil (TCH), capecitabine–oxaliplatin (CAPOX), 5-fluorouracil–leucovorin–oxaliplatin–docetaxel (FLOT), FOLFIRINOX (5-fluorouracil, leucovorin, irinotecan, and oxaliplatin), bleomycin–etoposide–cisplatin (BEP), and single-agent cisplatin. Chemotherapy was administered predominantly in 21-day or 14-day cycles, depending on the regimen (21-day cycles for Nab-PC, PC, TCH, CAPOX, BEP, and cisplatin; and 14-day cycles for FLOT and FOLFIRINOX). Standard dosing at this centre typically ranged from cisplatin 75–100 mg/m² per cycle, oxaliplatin 85 mg/m² per cycle, and carboplatin dosed to a target AUC of 5–6 per cycle, with doses individualized based on body surface area (BSA) or renal function as per institutional protocols. Chemotherapy was discontinued in four patients one due to treatment-related toxicity and three due to non-toxicity-related reasons (such as clinical deterioration/personal constraints). For each patient, the total number of cycles received was documented and categorized as ≤1, 2–5, or ≥6 cycles. For each platinum agent, both the mean dose per cycle and the cumulative dose across the treatment course were calculated.

Data collection

After obtaining written informed consent, baseline data were collected using a structured case report form (CRF) developed from validated sources. The CRF included sociodemographic details (age, gender, social history, etc), clinical characteristics (cancer site, stage, comorbidities, etc), and treatment-related information (chemotherapy regimen, treatment duration, concomitant chemotherapy agents, cumulative dose, etc). Details of concomitant chemotherapy agents were collected, including neurotoxic drugs (e.g., paclitaxel, nab-paclitaxel) and non-neurotoxic

drugs (e.g., 5-fluorouracil, capecitabine, leucovorin, irinotecan, bleomycin, etoposide), and these were recorded and presented in the analysis.

Neuropathy Assessment

Peripheral neuropathy (PN) was assessed using the EORTC QLQ-CIPN20 (European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire–Chemotherapy-Induced Peripheral Neuropathy 20-item scale) to assess patient-reported symptom burden. In addition, clinician-assigned NCI CTCAE (National Cancer Institute Common Terminology Criteria for Adverse Events) grades were collected retrospectively to facilitate clinical interpretation of patient-reported EORTC scores, and the frequency of patients in each grade, along with the corresponding mean EORTC scores, is provided in Supplementary Table 1.

Ethical considerations

Ethical approval for the study protocol was obtained from the Institutional Ethics Committee (Protocol ID: BMHR/2024/0090) prior to the initiation of the study, in accordance with the ethical guidelines for human research.

Statistical Analysis

Data were analyzed using IBM SPSS Statistics and Python. Categorical variables were summarized as frequencies and percentages, while continuous variables were described using mean and standard deviation (SD) as appropriate.

The Mann–Whitney U test was used to compare the continuous outcome across categorical variables with two groups, while the Kruskal–Wallis test was applied for variables with more than two groups. Ordinal logistic regression was used for multivariate analysis, with variables entered as factors or covariates based on data distribution. A p-value < 0.05 was considered statistically significant. To identify the platinum-based regimen associated with higher symptom burden, post hoc comparisons were performed using Dunn's test with Bonferroni correction following a significant Kruskal–Wallis test. Bonferroni-adjusted p-values < 0.0018 were considered statistically significant.

To strengthen the evidence and account for potential confounding, a multivariate regression analysis was performed, incorporating key clinical and treatment-related factors that could influence symptom burden. An ordinal logistic regression model was used. Selected categorical variables were regrouped to improve statistical power and ensure adequate cell counts, as summarized in Table 3. Regrouping of co-morbidities was dichotomized as diabetes mellitus versus others, and chemotherapy regimens were regrouped based on the platinum backbone, as detailed in Supplementary Table 2. Age and cumulative dose were included as continuous variables, while gender and exposure to concomitant chemotherapy drugs were retained in their original categories due to adequate distribution.

Multicollinearity diagnostics indicated acceptable levels of collinearity among predictors, with VIF values ranging from 1.47 to 4.25, all below commonly accepted thresholds. Therefore, all variables were retained in the final model.

Results

The overall symptom burden of peripheral neuropathy (PN) among the study population (N = 108) demonstrated a mean total score of 43.9 ± 19.33, with a median of 42.49 (IQR 28.25), reflecting a moderate level of symptom burden.

The study population had a roughly equal gender distribution, with slightly more females. Gender, age (mean 56.7 ± 8.3 years), BMI (Body Mass Index), smoking, and alcohol history were not significantly associated with the symptom burden of PN ($p > 0.05$). Most participants were ex-smokers or had ceased alcohol use, and the average BMI (mean 23.9 ± 2.7) was in the underweight range, consistent with cancer-related muscle wasting. Ovarian cancer was the most common primary site among participants, with Stage II being the most frequent stage at diagnosis. Nearly half of the participants had diabetes as a comorbidity. However, none of the factors including primary cancer site, stage, diabetes, dose per cycle, cumulative chemotherapy dose, or number of cycles showed a statistically significant association with the symptom burden of PN ($p > 0.05$). Table 1 presents the baseline demographic and clinical characteristics of the study participants, along with corresponding p-values assessing their association with symptom burden.

Analysis of the symptom burden scores across the three platinum drugs revealed a statistically significant difference ($p = 0.043$). A post hoc Dunn's test with Bonferroni correction showed that the symptom burden was significantly higher in patients receiving carboplatin-

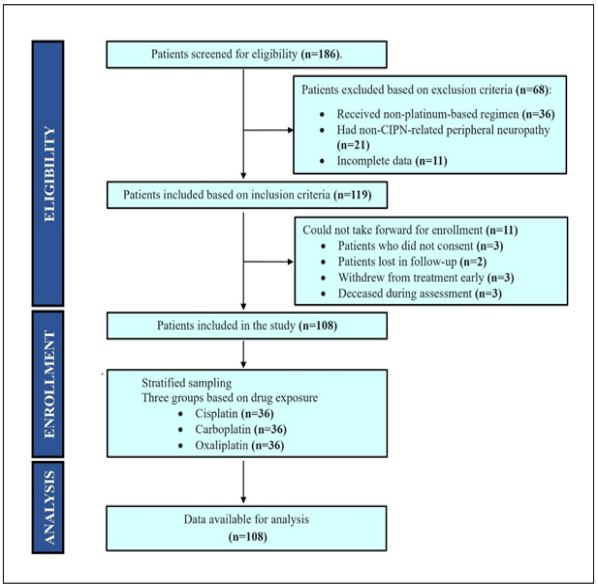

Figure 1. STROBE flowchart illustrating patient screening, eligibility assessment, exclusions, and final enrollment for the study on chemotherapy-induced peripheral neuropathy. The diagram shows the total number of patients assessed, reasons for exclusion, and the final sample size included in the analysis.

Table 1. Baseline Characteristics in the Study Population

Variables	Frequency, n (%)	p-value
Platinum drugs		
Carboplatin	36 (33.3)	0.043*
Oxaliplatin	36 (33.3)	
Cisplatin	36 (33.3)	
Gender		
Male	46 (42.6)	0.612
Female	62 (57.4)	
Age in years, Mean ± SD (95% CI)	56.7 ± 8.3 (55.4 – 58.6)	0.075
BMI, Mean ± SD (95% CI)	23.9 ± 2.7 (23.4 – 24.5)	0.937
Smoking		
Ex-Smoker	30 (27.8)	0.675
Non-Smoker	78 (72.2)	
Alcohol consumption		
Ex-Alcoholic	28 (25.9)	0.17
Non-Alcoholic	80 (74.1)	
Primary site of cancer		
Ovary	37 (34.3)	0.157
Endometrium	16 (14.8)	
Colon	23 (21.3)	
Oral	14 (13)	
Lung	18 (16.7)	
Stage of cancer		
Stage 1	3 (2.8)	0.839
Stage 2	41 (38.0)	
Stage 3	34 (31.5)	
Stage 4	30 (27.8)	
Co-morbidities		
Diabetes Mellitus	52 (48.1)	0.313
Hypothyroidism	22 (20.4)	
Infection	21 (19.4)	
Autoimmune Disease	11 (10.2)	
Nil	2 (1.9)	
Regimen		
Nab-PC	11 (10.2)	0.003*
PC	15 (13.9)	
TCH	10 (9.3)	
CAPOX	18 (16.7)	
FLOT	10 (9.3)	
FOLFIRINOX	8 (7.4)	
Cisplatin	20 (18.5)	
BEP	16 (14.8)	
Dose per cycle in mg, Mean ± SD (95% CI)		
Carboplatin	104.9 ± 172.8 (72.0 – 137.9)	0.19
Oxaliplatin	49.1 ± 74.1 (35.0 – 63.3)	0.134
Cisplatin	21.2 ± 34.9 (14.5 – 27.8)	0.287
Cumulative dose in mg, Mean ± SD (95% CI)		
Carboplatin	1564.7 ± 1027.9 (1216.9 – 1912.5)	0.17
Oxaliplatin	1008.3 ± 269.9 (917.0 – 1099.7)	0.274
Cisplatin	430.6 ± 197.5 (363.7 – 497.4)	0.121
Concomitant chemotherapy agents		
Nab-Paclitaxel	22 (20.4)	0.007*
Paclitaxel	32 (29.6)	
Non-neurotoxic drugs a	54 (50.0)	
Number of cycles		
0 - 1 cycle	4 (3.7)	0.125
2 – 5 cycles	12 (11.1)	
≥ 6 cycles	92 (85.2)	

BMI – Body Mass Index, SD - Standard deviation, 95% CI – Confidence Interval, Nab-PC – Nab- Paclitaxel, Carboplatin; PC – Paclitaxel, Carboplatin; TCH: Docetaxel, Carboplatin, and 5-Fluorouracil; CAPOX: Capecitabine and Oxaliplatin; FLOT: 5-Fluorouracil, Leucovorin, Oxaliplatin, and Docetaxel; FOLFIRINOX: 5-Fluorouracil, Leucovorin, Irinotecan, and Oxaliplatin; BEP: Bleomycin, Etoposide, and Cisplatin.
aNon-neurotoxic drugs include 5-Fluorouracil, Capecitabine, Leucovorin, Irinotecan, Bleomycin, Etoposide
*A p-value < 0.05 was considered statistically significant.

based regimens compared to those receiving oxaliplatin (adjusted p = 0.0012). No significant differences were observed between carboplatin and cisplatin (p = 0.0021) or between oxaliplatin and cisplatin (p = 0.9042), indicating that the carboplatin-based regimen is more strongly associated with increased symptom burden.

Concomitant chemotherapy agents that were present in the study regimens were also associated with significantly higher symptom burden (p = 0.007). In particular, post hoc analysis showed that patients receiving paclitaxel along with platinum drug reported significantly greater symptom burden compared to those on regimens without paclitaxel (adjusted p = 0.0007), indicating a substantial contribution of paclitaxel to overall neurotoxicity.

Further analysis comparing regimens against symptom burden also demonstrated significant differences among the platinum-based regimens (p = 0.003). Post hoc Dunn's test with Bonferroni correction revealed that the paclitaxel–carboplatin (PC) regimen was associated with a significantly higher symptom burden compared to the docetaxel, carboplatin, and 5-fluorouracil (TCH) regimen (adjusted p = 0.0009) and the capecitabine with oxaliplatin (CAPOX) regimen (adjusted p = 0.0005). No significant differences were observed between any other regimens' comparisons (adjusted p > 0.0018). These findings suggest that the PC regimen contributes more substantially to symptom burden among study participants. Table 2 summarizes the results of the post hoc Dunn's tests with Bonferroni correction.

To address potential confounders, a multivariate ordinal regression was performed. Variables were regrouped as described in the Methods and detailed in Supplementary Table 2. The analysis demonstrated that the PC regimen was significantly associated with a higher symptom burden of peripheral neuropathy (p < 0.05). Paclitaxel exposure alone was also associated with increased symptom burden; however, the wide confidence

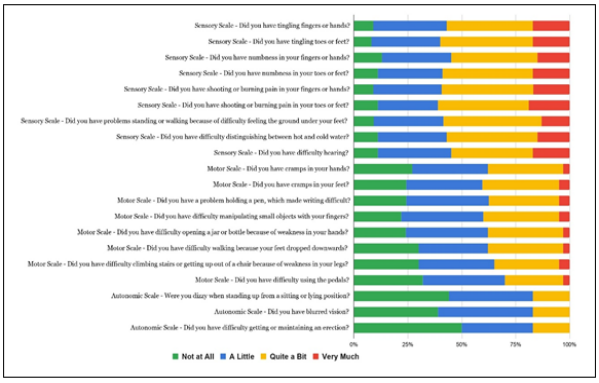

Figure 2. Stacked bar chart showing the distribution of responses to individual EORTC QLQ-CIPN20 items among patients receiving platinum-based chemotherapy. Colors represent symptom severity categories: green = not at all, blue = a little, yellow = quite a bit, and red = very much.

interval indicates substantial uncertainty in the precision of this estimate, likely reflecting limited sample size within this subgroup. Age, cumulative dose, gender, and diabetes were not significantly associated with symptom burden (p > 0.05). Overall, after adjustment for patient- and treatment-related factors, the PC regimen remained an independent predictor of increased peripheral neuropathy symptom burden. This is presented in Table 3.

We analyzed the types of PN symptoms in the study population. Sensory symptoms were the most common (Mean ± SD: 55.69 ± 17.18), followed by motor (36.91 ± 14.71) and autonomic symptoms (23.48 ± 3.50). Participants receiving the PC regimen reported higher sensory scores, indicating a stronger link between this regimen and sensory neuropathy. Figure 2 shows the distribution of symptom burden by type, and Table 4 summarizes the total and type-specific scores, confirming the predominance of sensory symptoms. The high SD in sensory scores reflects wide variability, with the PC

Table 2. Dunn's test with Bonferroni Correction for Multiple Comparisons

Variable	Adjusted p-value	Significance
Platinum drug		
Carboplatin vs Oxaliplatin	0.0012*	Significant
Carboplatin vs Cisplatin	0.0021	Non-Significant
Oxaliplatin vs Cisplatin	0.9042	Non-Significant
Concomitant chemotherapy agents		
Paclitaxel vs Nab-Paclitaxel	0.0007*	Significant
Others	>0.0018	Non-Significant
Regimen		
PC vs TCH	0.0009*	Significant
PC vs CAPOX	0.0005*	Significant
Others	>0.0018	Non-Significant

PC – Paclitaxel, Carboplatin; TCH: Docetaxel, Carboplatin, and 5-Fluorouracil; CAPOX: Capecitabine and Oxaliplatin. *Adjusted p-value of < 0.0018 was considered significant based on Bonferroni correction for multiple comparisons in Dunn's test.

Table 3. Multivariate Ordinal Regression for Major Factors Influencing Peripheral Neuropathy Symptom Burden

Category	Adjusted OR	95% CI	p-value
Age	0.99	0.93 – 1.06	0.823
Cumulative dose	1	0.99 – 1.00	0.089
Gender			
Male	2.56	0.89 – 7.45	0.158
Female	Reference	–	–
Co-morbidities			
Diabetes Mellitus	1.01	0.4 – 2.6	0.981
Others	Reference	–	–
Regimen			
PC regimen	2.94	1.19 – 5.6	0.014*
Carboplatin-based regimens (excluding PC)	1.87	0.29 – 8.9	0.511
Oxaliplatin-based regimens	0.89	0.37 – 2.27	0.813
Cisplatin-based regimens	Reference	–	–
Concomitant chemotherapy agents			
Paclitaxel	7.68	1.05 – 50.7	0.029*
Nab-Paclitaxel	0.51	0.23 – 3.65	0.652
Non-neurotoxic drugs[a]	Reference	–	–

OR – Odds ratio, CI – Confidence Interval, PC – Paclitaxel, Carboplatin. [a]Non-neurotoxic drugs include 5-Fluorouracil, Capecitabine, Leucovorin, Irinotecan, Bleomycin, Etoposide, *A p-value < 0.05 was considered statistically significant.

Table 4. Symptom Burden Scores Across Sensory, Motor, and Autonomic PIPN

Symptom Burden Score Domain	N	Mean	SD	Median (IQR)
Total Score	108	43.9	19.33	42.49 (28.25)
Sensory Score	53	55.69	17.18	55.21 (33.85)
Motor Score	37	36.91	14.71	39.88 (24.7)
Autonomic Score	18	23.48	3.5	22.95 (6.0)

SD – Standard deviation, IQR – Interquartile range, PIPN – Platinum-induced peripheral neuropathy

regimen contributing more to higher scores.

Discussion

The overall burden of peripheral neuropathy was moderate, with symptoms including sensory, motor, and functional disturbances that may limit daily activities without causing severe disability. This level of symptom burden (mean ± SD: 43.9 ± 19.33) was generally observed among patients with clinician-assigned NCI CTCAE (National Cancer Institute Common Terminology Criteria for Adverse Events) Grade 2 neuropathy, as shown in Supplementary Table 1, which serves as a guide, noting that individual EORTC scores may vary within each grade.

Our findings indicate that carboplatin-based regimens were significantly associated with a higher symptom burden. This result contrasts with the findings of Novak M et al., where oxaliplatin was reported to cause a greater symptom burden [8]. A key reason for this discrepancy could be the differing regimen comparisons: while Novak M et al., compared oxaliplatin with either cisplatin or carboplatin alone, our study included a broader range of regimens involving carboplatin, cisplatin, and oxaliplatin [8].

Another finding of our study was that among the concomitant chemotherapy agents included in the treatment regimens, paclitaxel was associated with a higher symptom burden. This contrasts with previous findings by Kida K et al., where nab-paclitaxel (nanoparticle albumin-bound paclitaxel) was reported to cause greater symptom burden of PN. The discrepancy may be due to differences in patient populations, dosing schedules, or the co-administered agents in each regimen [9].

Further subgroup analysis in our study revealed that the paclitaxel–carboplatin (PC) regimen was most strongly associated with increased symptom burden. The higher symptom burden observed with the PC regimen may be attributed to the additive neurotoxic effects of a taxane and a platinum drug in the same regimen. Paclitaxel disrupts microtubule function, impairing axonal transport, while carboplatin may induce DNA damage in peripheral nerves together amplifying neuronal injury and PN [10, 11]. This aligns with the findings of Ezendam NP et al., which also reported that the PC regimen was more strongly associated with higher symptom burden in patients on platinum-based chemotherapy [12]. However, it is important to note that

Ezendam NP et al., conducted research for nearly 10 years, providing valuable long-term data, and the sample predominantly consisted of participants treated with the PC regimen (95%), with other regimens comprising only 5% of the cohort [12]. This limited variation limits generalizability. In contrast, our study had a more diverse representation of platinum-based regimens, strengthening the relevance and applicability of our findings. These findings are also supported by Bonhof CS et al [13].

In a study by Brotto L et al., a direct comparison between the PC regimen vs the combination of PC regimen with cisplatin and topotecan (PC+CT) demonstrated that patients receiving the PC regimen experienced a persistent burden of PN symptoms. Notably, this burden became more pronounced following multiple cycles of chemotherapy, underscoring the cumulative nature of platinum-induced neurotoxicity. These findings are consistent with our study results, which also highlight the progressive increase in symptom burden with repeated exposure to the PC regimen [14].

Our study also observed that sensory symptoms contributed the most to overall symptom burden in participants. This observation is in contrast with findings from a study by Hung HW et al., which reported a mean sensory score of 29.15, greatly differing from our study's mean. Hung HW et al., reported a more evenly distributed symptom burden in their study population, and it might be because it included only patients who had received ≥4 cycles of chemotherapy, whereas our study included patients who received more than one cycle, thereby capturing both short- and long-term symptom burden [15].

Matsuoka H et al. reported that after six cycles of the PC regimen, patients whose cancer had not recurred showed gradual improvement in PN symptoms and overall quality of life, unlike patients with recurrence [16]. This suggests that while chemotherapy contributes to symptom burden, cancer recurrence may have an even greater impact on quality of life. Although our study did not assess post-treatment recovery, these findings indicate that PN symptoms can improve over time and that symptom burden should be interpreted in the context of both treatment and disease status.

Despite the valuable insights provided, this study has certain limitations. Although the sample size was modest, this was addressed by regrouping for multivariate analysis, which helped maintain sufficient power to detect relevant differences across subgroups. Symptom assessment relied on patient-reported outcomes, which may have introduced reporting bias. Additionally, given the observational design, detection bias is possible, as neuropathy assessments were not blinded. Chemotherapy regimens were assigned according to routine clinical practice based on patient characteristics, including renal function, age, and comorbidities, which may also affect neuropathy risk. These variables were included in multivariate analyses to adjust for potential confounding; however, residual confounding cannot be completely excluded.

Further, as this investigation was conducted at a single center, the findings may not be fully generalizable to broader populations, introducing a moderate risk of bias. Nevertheless, the study provides important preliminary data and valuable insights that can inform future multicenter investigations and guide clinical practice.

In conclusion, our study demonstrates that among platinum-based chemotherapy regimens, the paclitaxel–carboplatin (PC) regimen is linked to a higher burden of peripheral neuropathy (PN), adversely affecting patients' daily functioning and quality of life. Severe neurotoxicity may require dose modifications or treatment delays, which could impact chemotherapy efficacy. These findings emphasize the need for early detection and proactive management, including baseline neurological assessments, regular symptom monitoring, and timely neuroprotective strategies, to minimize long-term complications and enhance treatment tolerability, especially in patients receiving the PC regimen.

Declarations

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Clinical Trial Registration

Not applicable

Conflicts of Interest/Competing Interests

The authors declare that they have no conflicts of interest.

Availability of Data And Material

The datasets generated and/or analyzed during the present study are available from the corresponding author upon reasonable request.

Code Availability

This study did not involve the use of any custom code.

Authors' Contributions

All authors contributed significantly to this manuscript. Dr. Bhavadharini K was responsible for conceptualizing the research topic, designing the case report form (CRF), collecting data, performing data cleaning and validation, conducting statistical analyses, and drafting the original manuscript. Dr. Bhavadharani R contributed to protocol development, data collection, data cleaning, and drafting the initial manuscript. Dr. Sapthami Ramya V. G participated in CRF design, data collection, data cleaning, and original manuscript drafting. Dr. Shailaja Krishnamoorthy (Corresponding Author) contributed to formulating the research topic and critically revised the manuscript for important intellectual content. All authors approved the final version for submission.

Ethics Approval

Ethical approval for this study was obtained from the Institutional Ethics Committee for Biomedical Health Research (IEC-BMHR), Gleneagles Health City Chennai (GHCC), which is registered with the appropriate regulatory authority. The study was approved on 12 July

2024 under Protocol ID: BMHR/2024/0090.

Consent to Participate

Written informed consent was obtained from all participants, and the trial was conducted in accordance with the Declaration of Helsinki.

Consent for Publication

Written informed consent was obtained from all participants, and the trial was conducted in accordance with the Declaration of Helsinki.

Originality Declaration for Figures

All figures included in this manuscript are original and have been created by the authors specifically for the purposes of this study. No previously published or copyrighted images have been used. The authors confirm that all graphical elements, illustrations, and visual materials were generated from the data obtained in the course of this research or designed uniquely for this manuscript.

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Declaration on Generative Ai and Ai-Assisted Technologies in the Writing Process

No generative AI or AI-assisted technologies were used in the writing, editing, analysis, or preparation of this manuscript. All work was carried out solely by the authors.

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