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Drug Prescription Patterns and Polypharmacy in Ovarian Cancer Patients at Thangam Cancer Center

Sriram T[1] *, Gladia Jenifer B[1], Nazmul MHM[2], Jayaprakash K[1], Manglesh Waran Udayah[2], Madhan Kumar Soutallu Janakiram[3], Gokul P[1], Appalaraju VVSS[4], SaminathanKayarohanam[5], Velmurugan C[3]

[1]Department of Pharmacy Practice, PGP College of Pharmaceutical Science and Research Institute, Namakkal 637207.
[2]Graduate School of Medicine, Perdana University, Damansara Heights, 50490 Kuala Lumpur, Malaysia.

[3]Department of Preclinical sciences, MAHSA University, Jenjarom 42610, Selangor, Malaysia.

[4]Faculty of Medicine, Department of Physiology, AIMST University, 08100 Bedong, Kedah, Malaysia.

[3]Department of Anatomy, Faculty of Medicine, Manipal University College 75150 Melaka Malaysia.

[4]Department of Medicinal Chemistry, Faculty of Pharmacy, MAHSA University, Bandar Saujana Putra, 42610 Jenjarom, Selangor, Malaysia.

[3]Department of Pharmacology, PGP College of Pharmaceutical Science and Research Institute, Namakkal-637207.
[4]Department of Preclinical sciences, MAHSA University, Jenjarom 42610, Selangor, Malaysia.

[5]Faculty of Bioeconomics, Food & Health Science, Prima Peninsula, Jalan Setiawangsa 11, University Geomatika54200 Malaysia.

Corresponding Author*: drsriram2001@gmail.com

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ABSTRACT

Ovarian Cancer is the most prevalent genital cancer among women [1 3]. It accounts about 17% of genital cancer in women and sixth leading cause of cancer-related deaths among women in United States. More than 19,680 ovarian cancer cases were estimated in 2024 [4-6]. The clinical outcomes for ovarian cancer patients remain poor despite sophisticated treatment strategies. This is largely due to the complexity of the disease and the aggressive nature of its progression.3 Ovarian cancer patients received more than 5 drugs as compared to young women, this ultimately results in polypharmacy [7, 8]. Use of multiple drugs during the treatment of ovarian cancer patient is crucial for preventing disease progression. Among 100 ovarian cancer patients 81% were above 45 ages. The mean age is 54.6 with a standard deviation =11.84. 63% patient with comorbidities were included. 39% patients were diagnosed at fourth stage of ovarian cancer. 100 patients received total of 124 individual drugs with a frequency (n)=1380. All patients received at least 6 drugs with standard deviation 1.9 per prescription. 78 patients received paclitaxel and carboplatin combination in their chemotherapy. The study resulted in identifying 1095 interactions out of those 350 were pDDIs. The total pDDIs in inpatients were 496 with a mean of 4.96 per patient. Ondansetron + Domperidone were most common potential pDDIs in 79 patients followed by paclitaxel + carboplatin (78). Majority of supportive drugs produce serotonin syndrome, QTc interval prolongation, CNS depression effect and interact with the pharmacokinetic effects of other drugs. Drug duplication among the same class of drugs were seen in 12 patients. The study underscores the significant risk of Drug-Drug Interactions in ovarian cancer treatment, stressing the need for vigilant monitoring. Overall, our findings emphasize the importance of tailored prescribing to enhance patient safety among ovarian cancer patients.

Key words: ovarian cancer, ovarian neoplasm, Prescription Pattern, Drug-Drug interactions.

INTRODUCTION

Ovarian Cancer is the most prevalent genital cancer among women [1- 3]. It accounts about 17% of genital cancer in women and sixth leading cause of cancer-related deaths among women in United States. More than 19,680 ovarian cancer cases were estimated in 2024 [4-6]. The clinical outcomes for ovarian cancer patients remain poor despite sophisticated treatment strategies. This is largely due to the complexity of the disease and the aggressive nature of its progression.[3] Ovarian cancer patients received more than 5 drugs as compared to young women, this ultimately results in polypharmacy [7, 8]. Use of multiple drugs during the treatment of ovarian cancer patient is crucial for preventing disease progression. Drug–drug interactions (DDIs) are the leading cause of Adverse Drug Events (ADEs), contributing approximately 20% to 30% of these events.[5] This approach helps to overcome patients' illness, drug related adverse events and also their comorbidities. However it leads to potential drug interactions and adverse effects, which can complicate patient care and potentially influence treatment outcomes [9-14]. This increases the risk of potential drug-drug interactions (DDIs) in patients, which can result in decreased drug effectiveness or increased toxicity. There is a growing need for systematic approaches to monitor and manage polypharmacy and DDIs in this patient population to ensure safe and effective treatment [15-19]. Effective medication management is crucial for maximizing treatment benefits and minimizing risks. However, research

indicates widespread instances of inappropriate drug prescriptions across various medical fields, where many patients receive medications that could potentially interact unfavorably with their primary treatments [11, 12, 20-24]. Pharmacovigilance (PV) is the set of approach for the detection, assessment, and prevention of ADEs especially Drug – Drug Interactions. PV in Italy, mandated by Law D. Leg. 95/8 April 2003, focuses on detecting and preventing adverse drug reactions post-market. This traditional approach faces challenges like delayed reports and underreporting due to reliance on spontaneous reporting by healthcare professionals. To address these issues, Regulation (EU) No 1235/2010 and Directive 2010/84/EU require marketing authorization holders to actively monitordrug safety, update product information, and maintain a pharmacovigilance system master file (PSMF). They must also submit Periodic Safety Update Reports (PSURs) to authorities. Delays in detecting adverse drug events (ADEs), inadequate assessments, and underreporting of drug-drug interactions (DDIs) can negatively affect patient health [13, 14, 25-33]. Oncology pharmacists playa crucial role in cancer care by managing medication therapies, providing patient education, and ensuring safe and effective treatments. Their involvement in clinical care and patient support improves outcomes, increases medication adherence, and enhances patient satisfaction. They also contribute to cost savings, identify medication errors, and help alleviate the global shortage of oncology physicians. Their expanded role enhances the efficiency and effectiveness of oncology care teams [15, 34-39]. Pharmacovigilance for the treatment of ovarian cancer needs to be enhanced in India [16, 40-48]. Timely monitoring and management of adverse drug reactions (ADRs) in cancer patients can significantly improve treatment outcomes. Increasing awareness and participation in Pharmacovigilance Programs among healthcare professionals is crucial to ensuring effective reporting and management of ADRs associated with anticancer drugs [17, 49- 53].

This study aims to investigate the drug prescription patterns, drug interactions and the extent of polypharmacy among ovarian cancer patients at Thangam Tertiary Cancer Center in Namakkal, Tamil Nadu, South India. This prospective study will contribute valuable insights into the management of ovarian cancer, providing a basis for future interventions to optimize pharmacotherapy in the ovarian cancer population [54, 55].

MATERIALS AND METHODS

Study design and ethical clearance:

This prospective study was conducted in Thangam tertiary cancer center, Namakkal, Tamil Nadu. The study began after obtaining permission from the Institutional Ethical Committee Ref. no. (TH-IEC)- ECR/1069/Inst/TN/2018/RR-21.

Inclusion criteria and exclusion criteria:

Inclusion criteria: Ovarian cancer patients aged 18- 80 who underwent treatment with chemotherapy, targeted therapy, and supportive treatment with proper medical records with or without comorbidities are included for the study.

Exclusion criteria: Ovarian cancer patients treated with only radiation and surgery, patient without proper medical records and patients diagnosed with more than one primary cancer were excludedfrom the study.

Data collection and analysis:

We used a specially designed data collection form to note patients age, comorbidities, and drugs used in their treatment. All the prescribed drugs were analysed for drug prescription pattern, Drug- Drug Interactions and polypharmacy. The patients Potent Drug-Drug Interactions (pDDIs) were examined using UpToDate software (Lexicomp® database)[18]. Potential drug-drug interactions (pDDIs) were categorized using severity and risk rating scales, accompanied by recommendations for prophylaxis and management of these interactions.

Classification of pDDIs based on different rating scales and explanations:

pDDIs according to the level of severity:

Severity Rating:

Indicates the degree of impact of potential drug-drug interactions (pDDIs).

Minor: The pDDI is concerning but not harmful. If the benefits significantly outweigh the risks, therapy may continue with adjustments to dose and frequency, without changing the treatment.

Moderate: These pDDIs are noteworthy. When the benefits of using two drugs together outweighthe risks, careful monitoring is required. This might involve empiric dose adjustments or modifying the therapy to prevent or reduce adverse effects.

Major: These pDDIs are clinically significant and potentially life-threatening. They necessitate clinical interventions, including avoiding the simultaneous use of these two drugs, to prevent and minimize adverse outcomes.

PDDIs according to risk rating:[20]

Risk rating: Indicates the level of urgency and the actions necessary to respond to pDDI.

a) A: No known interactions, b) B: No action needed, c) C: Monitor therapy, d) D: Consider treatment modification, e) X: Avoid concomitant prescription.

Polypharmacy and Its Contributing Factors:

Therapeutic complexity significantly increases the risk of Drug-Drug Interactions (DDIs). WHO describes polypharmacy is the practice of prescribing five or more medication including prescription, over the counter drugs and some traditional treatments. Factors such as patient age, sex, disease condition and their comorbidities increase polypharmacy results in Drug-DrugInteractions.

RESULT

Patient's descriptions:

Among the 100 Female ovarian cancer patients, about 81% were above 45 years age. The mean age is 54.6 and standard deviation about 11.84. About 63% of patient present with major comorbidities such as Hypertension, Hypothyroidism, Hyperthyroidism and Diabetes mellitus. 39% patients were diagnosed at IV stage. 43% patient underwent Neo-adjuvant chemotherapy.

Table 1: Patient demographic details

Patient demographic details:	No of patients
Type of therapy:	
Neo-adjuvant chemotherapy	39
Adjuvant chemotherapy	43
Palliative chemotherapy	18
Stage of cancer:	
I	1
II	12
III	48
IV	39
Other comorbidity conditions:	
Patient without comorbidities	37
Patient with comorbidities	63
Antineoplastic therapy cycle undergoing by patients:	
C1- C2	39
C3- C4	29
C4 – C6	32

Figure1: Age distribution in patients:

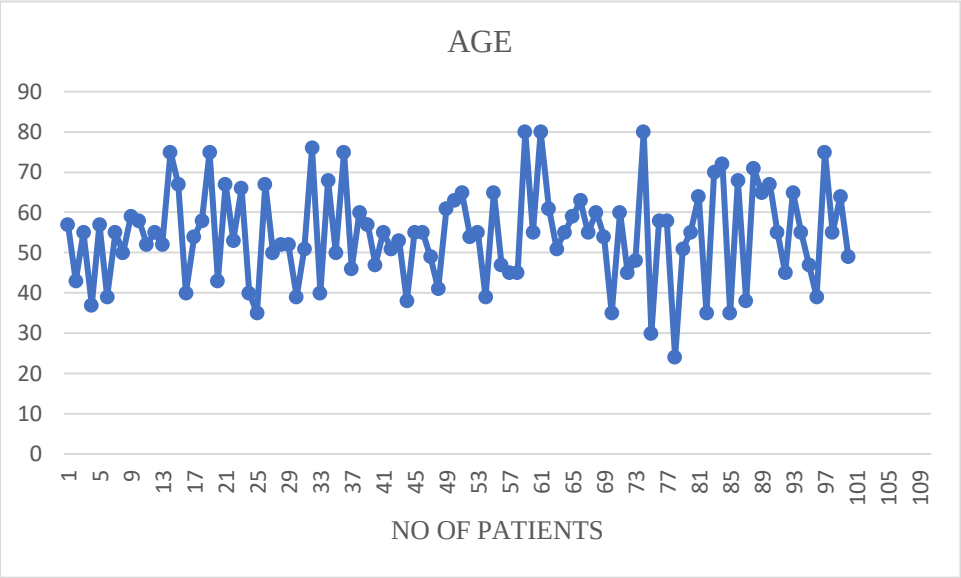
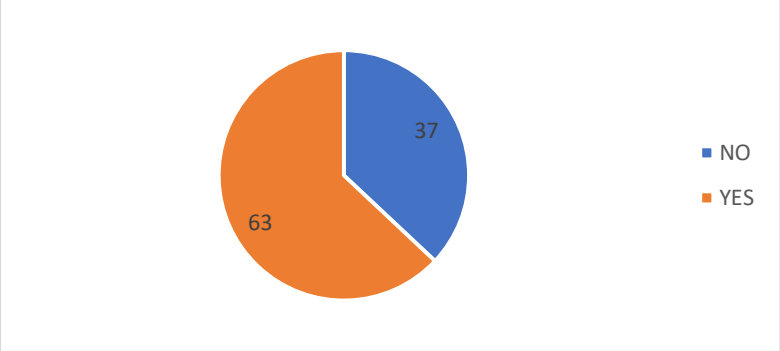


Figure 2: Patient comorbidity range



Drug utilization among ovarian cancer patients:

100 patients received total of 124 drugs, of which antiemetic, gastroprotective agents and supplements were commonly prescribed medication. Carboplatin and paclitaxel were preferable drugs for the treatment of ovarian cancer. All inpatients received chemotherapy and supportive treatment during hospitalization. 5-HT3 receptor antagonist, H_2 receptor antagonist, Proton Pump Inhibitors (PPIs), Corticosteroids, Opioid analgesic, NSAID and supplements were used in the supportive treatment which is similar to the study conducted by Manichavasagam. M et.al.[22] All the inpatients received Granisetron/ondansetron, ranitidine/pantoprazole, Dexamethasone andTramadol before starting their chemotherapy. Carboplatin and paclitaxel were used by majority ofthe patients (n = 78%). Recurrent patients received combination of Carboplatin, paclitaxel, and bevacizumab.

Table 2: Drug utilization pattern among ovarian cancer patient

Drug class	Frequency of drug prescribed	Name of the Drugs
Cancer chemotherapy	11.%	Adriamycin, Capecitabine + Cyclophosphamide, Carboplatin, Cisplatin, Cyclophosphamide, Docetaxel, Gemcitabine, Irinotecan, Paclitaxel, Pemetrexed
Targeted chemotherapy	1.1%	Bevacizumab
Antiemetic drugs	15.2%	Aprepitant, Granisetron, Metoclopramide, Metoclopramide, Ondansetron, Ondansetron Dihydrate, Palonosetron
Gastroprotective drugs	18%	Domperidone + Esomeprazole, Naproxen + Domperidone, Oxetacaine + Aluminium Hydroxide + Dimethicone + Magnesium, Pantoprazole, Rabeprazole, Ranitidine
Analgesics and Antipyretic drugs	8.33%	Acetaminophen, Aceclofenac, Diclofenac, Ketoprofen, Ketorolac, Morphine, Naproxen, Paracetamol + Ibuprofen, Paracetamol + Mefenamic Acid, Tapentadol, Tramadol, Tramadol + Acetaminophen, Tramadol + Paracetamol, Tranexamic Acid
Antihypertensive drugs	2%	Amlodipine, Amlodipine + Atenolol, Atenolol, Chlorthalidone, Cilnidipine, Losartan + Hydrochlorothiazide, Telmisartan + Cilnidipine, Telmisartan + Hydrochlorothiazide
Antibiotics drugs	2.5%	Amikacin, Cefoperazone Sodium, Cefpodoxime Proxetil + Clavulanic Acid, Ceftriaxone + Sulbactam, Cefuroxime, ciprofloxacin, Faropenem, Diethylcarbamazine, Levofloxacin, Meropenem, Metronidazole, Metronidazole + Chlorhexidine, Ofloxacin + Ornidazole, Piperacillin + Tazobactam

Oral Hypoglycaemic drugs	1.3%	Dapagliflozin, Gliclazide + Metformin, Glimepiride, Glimepiride + Metformin, Metformin Hydrochloride + Sitagliptin
Antiallergic drugs	1.4%	Caffeine + Chlorpheniramine + Paracetamol + Phenylephrine, Chlorpheniramine Maleate, Chlorpheniramine Maleate + Dextromethorphan Hydrobromide, Codeine Phosphate + Triprolidine, Dexbrompheniramine Maleate, Dexbrompheniramine Maleate + Phenylephrine, Chlorpheniramine Maleate, Levocetirizine, Pheniramine Maleate, Triprolidine.
Supplements	17.7%	Alpha lipoic acid, Biotin + Calcium Pantothenate + Folic Acid, Elemental calcium, Calcium Citrate + Vitamin D3 + Folic Acid, Calcium Gluconate, Ferric Carboxymaltose, Flavoxate, Folic Acid + Vitamin B12 + Thiamine Mononitrate + Magnesium Oxide + Nicotinamide, Methylcobalamin + Niacinamide + Vitamin B6 + D-Panthenol, Tyrosine + Bromelain + Rutoside, vitamin B9, Vitamin D3.
Others	21.4%	Alprazolam, Atorvastatin, Atropine, Budesonide, Bisacodyl, chromium picolinate, Diphenoxylate + Atropine, Diethyl carbamazine, Dexamethasone, Dextrose, Duloxetine, Gabapentin, Gabapentin + Amitriptyline, Gabapentin + Nortriptyline + Methylcobalamin, Heparin, Lactulose, Levetiracetam, Potassium Chloride, Pragabalin + Duloxetine, Pragabalin + Nortriptyline + Methylcobalamin, Myo- inositol, olanzapine, Rivaroxaban, Salbutamol, Sodium Picosulfate + Milk of Magnesia + Liquid Paraffin, Thioclochicoside, thyroxin.

Distributions patterns of pDDIs:

100 patients reported a total of 1095 interactions out of these 350 interactions were potential Drug- Drug interactions during their treatment and discharge prescription. The severity of the Potential Drug-Drug interaction ranges from major to minor. The risk levels are X (avoid combination) 4.6%, D (consider therapy modification) 22.7%, C (monitor therapy) 39.7%, B (no action needed) 32.8% and A (no known interaction) 0.09%. The age group 55-64 have more interaction that other age groups. Patients with polypharmacy and comorbidities had more PDDIs than others. Ondansetron + Domperidone were the most common potential DDIs in majority of the patients followed Paclitaxel + carboplatin. Most of the interactions follows pharmacokinetic mechanism as they decrease or increase the active components in their treatment. Gastro intestinal agents were the drugs that affect various organs of the body.

Polypharmacy and risk of pDDIs:

Polypharmacy is seen in all the in-patients undergone cancer chemotherapy and its supportive treatment. Above 78% of the patient at discharge were found with polypharmacy. The risk of pDDIs were increased with age, comorbidity, and their cancer stage.

Table 3: Age vise distribution of drugs and their interactions:

Age Group	**18-24**	**25-34**	**35-44**	**45-54**	**55-64**	**65-75**	**Above 75**
Total Drugs Used	14	9	100	278	576	147	46
Total Interactions	4	3	80	178	481	106	20

Figure 3: Drug utilization vs interaction among ovarian cancer patient:

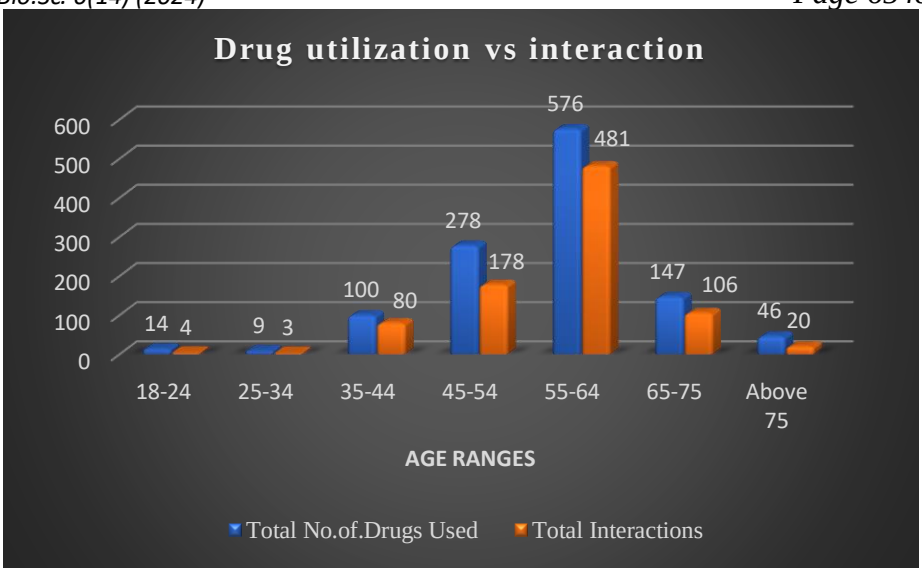


Table 4: list of pDDIs:

Risk level	Major Drug- Drug Interaction	Description	Severity
X (4.6%)	Ondansetron + Domperidone	QTc prolongation and arrhythmias	Moderate
	Domperidone + Aprepitant	Increase serum concentration	Major
	Potassium Chloride + Pheniramine	Enhance ulcerogenic effect.	Moderate
	Potassium Chloride + Nortriptyline	Enhance ulcerogenic effect.	Moderate
D (22.7%)	Paclitaxel + Carboplatin	Increases myelosuppression	Major
	Dexamethasone + Aprepitant	Increase the Concentration of Dexamethasone	Minor
	Dexamethasone + Aluminium Hydroxide	Decrease the bioavailability of Dexamethasone	Moderate
	Dexamethasone + Milk of Magnesia	Decrease serum concentration of corticosteroid.	Moderate
	Tramadol + Gabapentin	CNS Depressant	Major
	Tramadol + Amitriptyline	CNS Depressant and Serotonergic effect	Major
	Tramadol + Alprazolam	CNS Depressant	Major
	Tramadol +	CNS Depressant	Major

	Chlorpheniramine		
	Tramadol + Pregabalin	CNS Depressant	Major
	Tapentadol + Pheniramine	CNS Depressant	Major
	Tapentadol + Nortriptyline	CNS Depressant	Major
	Levothyroxine + Milk of Magnesia	Decrease serum concentration of levothyroxine	Moderate
	Levothyroxine + Multivitamin	Decrease effect of thyroxine	Moderate
	Levothyroxine + Iron Preparation	Decrease serum concentration of levothyroxine	Moderate
	Levothyroxine + Calcium	Decrease the effect of levothyroxine	Moderate
	Sodium Picosulphate + Tinidazole	Decrease the effect of sodium picosulphate	Moderate
	Pyrimethamine + Folic Acid	Decrease the effect of sodium pyrimethamine	Moderate
	Glimepiride + Sitagliptin	Enhance hypoglycemic effect	Moderate
	Morphine + Nortriptyline	CNS Depressant	Moderate
	Pantoprazole + Cefuroxime	Decrease the effect of cefuroxime	Moderate
	Pantoprazole + Ketoconazole	Decrease the effect of ketoconazole	Moderate
C (39.7%)	Paclitaxel + Cilnidipine	Increase serum concentration of paclitaxel	Moderate
	Paclitaxel + Telmisartan	Leads to hypotension associated problem	Moderate
	Paclitaxel + Aprepitant	Increase serum concentration of paclitaxel	Moderate

	Adriamycin + Cyclophosphamide	Enhance cardiotoxic effect of anthracyclines	Major
	Capecitabine + Pantoprazole	Diminish the effect of capecitabine	Moderate
	Pemetrexed + Esomeprazole	Increase the risk of hematological toxicities	Major
	Ondansetron + Duloxetine	Enhance Serotonergic effect	Minor
	Domperidone + Nortriptyline	Decrease the effect of domperidone	Moderate
	Domperidone + Tramadol	Diminished gastrointestinal motility	Moderate
	Domperidone + Tapentadol	Decrease the effect of domperidone	Moderate
	Domperidone + Amitriptyline	Diminish the effect of domperidone	Moderate
	Domperidone + Codeine	Diminish the effect of domperidone	Moderate
	Domperidone + Chlorpheniramine	Decrease the effect of domperidone	Moderate
	Domperidone + Triprolidine	Decrease the effect of domperidone	Moderate
	Tramadol + Ondansetron	Serotonin syndrome or serotonin toxicity	Moderate
	Tramadol + Aprepitant	Increase active metabolite concentration	Moderate
	Tramadol + Metoclopramide	Increase serotonergic effect	Moderate
	Tramadol + Levofloxacin	Enhance hypoglycemic effect	Moderate
	Nortriptyline + Pregabalin	Enhance CNS Depressant effect	Moderate

	Tapentadol + Duloxetine	enhance Serotonergic effect	Moderate
	Dexamethasone + Metformin	Decrease the effect of metformin	Moderate
	Metformin + Pyrimethamine	Increase serum concentration of metformin	Moderate
	Tapentadol + Hydrochlorthiazide	Enhance toxicity of diuretics	Moderate
	Diclofenac + Bromelain	Enhance toxic effects with antiplatelet activity	Moderate
	Rosuvastatin + Calcium and Vitamin D3	Decrease serum concentration of rosuvastatin	Moderate
	Etoricoxib + Ciprofloxacin	Increase serum concentration of quinolones and increase neurotoxicity	Major
	Domperidone + Levosulpiride	Enhance toxicity effect of levosulpiride	Moderate
	Glibenclamide + Ranitidine	Enhance hypoglycemic effect	Moderate
	Glibenclamide + Tramadol	Enhance hypoglycemic effect	Moderate
	Alprazolam + Levocetrizine	Enhance CNS Depressant effect	Moderate
	Alprazolam + Nortriptyline	Enhance CNS Depressant effect	Moderate
	Alprazolam + Pregabalin	Enhance CNS Depressant effect	Moderate
	Levocitrizine + Pregabalin	Enhance CNS Depressant effect	Moderate
	Oxetacaine + Acetaminophen	Enhance toxicity effect of oxetacaine	Moderate
	Cyclophosphamide +	Decrease serum concentration	Minor

B (32.8%)	Ondansetron	of cyclophosphamide	
	Rabeprazole + Levothyroxine	Decrease serum concentration of levothyroxine	Minor
	Ranitidine + Milk of Magnesia	Decrease serum concentration of ranitidine	Minor
	Naproxen + Milk of Magnesia	Decrease absorption of naproxen	Minor
	Pantoprazole + Levothyroxine	Decrease the serum concentration of thyroid products	Minor
	Ondansetron + Metoclopramide	QTc interval prolongation	Minor
	Paracetamol + Ondansetron	Diminish the analgesic effect	Minor
	Domperidone + Granisetron	Enhance the QTc prolongation effect	Minor
	Tramadol + Milk of Magnesia	Increase the serum concentration of tramadol	Minor
	Paracetamol + Tramadol	Decrease the absorption of paracetamol	Minor
	Paracetamol + Granisetron	Decrease the absorption of paracetamol	Minor
	Esomeprazole + Levothyroxine	Decrease the serum concentration of thyroid product	Minor
	Paracetamol + Tapentadol	Decrease the absorption of paracetamol	Minor
	Pregabalin + Potassium Chloride	Enhance hyponatremic effect	Moderate
	Aceclofenac + Milk of Magnesia	Decrease the absorption of Aceclofenac	Minor
	Metformin + Pantoprazole	Increase the serum concentration of metformin	Minor

	Metformin + Telmisartan	Decrease the absorption of metformin	Minor
	Ondansetron + Salbutamol	QTc interval prolongation	Minor
	Ranitidine + Calcium	Decrease the serum concentration of ranitidine	Minor
	Ranitidine + Aluminium Hydroxide	Decrease the serum concentration of ranitidine	Minor
	Aprepitant + Adriamycin	Increase the serum concentration	Moderate
	Acetaminophen + Codeine	Decrease the absorption of acetaminophen	Minor
	Paracetamol + Metoclopramide	Increase the serum concentration of paracetamol	Minor
	Glipizide + Calcium & Vitamin D3	increase the absorption of sulfonyl urea	Minor
	Ondansetron + Ofloxacin	QTc interval prolongation	Minor
	Atorvastatin + Amlodipine	Increase the serum concentration of atorvastatin	Minor
	Atenolol + Milk of Magnesia	Decrease the serum concentration of atenolol	Minor
	Domperidone + Ciprofloxin	Enhances QTc prolongation	Minor
	Paracetamol + Morphine	Decrease the absorption of paracetamol	Minor
	Atorvastatin + Esomeprazole	Enhance toxic effect of atorvastatin	Minor
	Pregabalin + Potassium Chloride	Enhance the hyponatremic effect	Moderate
A (0.09%)	Docetaxel + Aprepitant	No known reaction	N/A

DISCUSSIONS

Many studies have found that drug interactions in ovarian cancer treatments can cause serious side effects. These interactions are responsible for about 7% of all drug-related harm and 4%

of deaths in cancer patients [23, 24, 56-63]. In this study, the total frequence of 1380 drugs were used by the patients. Out of these antineoplastic chemotherapy accounts about 12.1% gastroprotective agent and anti-emetics were found 18% and 15.2%. The most commonlyprescribed antineoplastic chemotherapy were carboplatin and paclitaxel followed by gemcitabine [25, 64-69]. Granisetron, ondansetron (5-HT3 receptor antagonist), Metoclopramide (D2 receptorantagonist) used as Antiemetic agents. Ranitidine (H2 blocker), Esomeprazole, Pantoprazole, Rabeprazole (PPI) were commonly used gastroprotective agents during the supportive therapy. Tramadol, paracetamol, and ibuprofen were used to overcome pain. Polypharmacy accounts for all the In-patients undergone chemotherapy and supportive treatment. 70% of patients continued to experience it at discharge. All In-patients received >8 drugs (Standard Deviation – 1.9) of that antiemetic, gastroprotective and analgesic were commonly prescribed drugs. Polypharmacy mainly occurs in patients with comorbidity. The use of five or more medication leads to at least one Potential Drug-Drug Interaction [26, 70].

This study highlighted more than 1095 number of drug interactions out of those 350 were PDDIs, clinically not proved in patients. These had potential adverse effect such as long durationof hospitalization, treatment failure, frequent visit to hospital and increased cost of treatment [27,71]. The total PDDIs in In-patients were 496 with mean 4.96 per person. The total PDDIs in discharge prescription were 599 with mean 5.99 per person in Tamil Nadu. The incident of PDDIswere maximum observed during supportive treatment. Ondansetron + Domperidone were the most common potential DDIs in majority of the patients followed Paclitaxel + carboplatin. The Ondansetron + Domperidone may enhance the QTc interval and may produce arrhythmias[28,29]. Carboplatin may enhance the myelosuppressive effect of taxane derivatives. The combination of Paclitaxel + Carboplatin requires therapeutical modification. Tramadol (opioid analgesic) used to manage pain during supporting treatment, frequently interact with many drugs, produce CNS depression effect, and also reduce pharmacological action of other drugs[24]. These patients need close monitoring for serotonin syndrome. Over 72% of the interaction follows pharmacokinetic mechanism as they decrease or increase the active components in their treatment. In our study, Gastrointestinal agents affect most of the body organs. Frequent use of Domperidone + Tramadol exerts opposing effects on gastric mobility [30, 71].

Our study highlights the use of multiple drugs from the same class for therapeutic purposesin 12 patients, prescribed in combination with other drugs. Antiemetic and Analgesic class of drugswere frequently duplicated in patient prescription. This results to the use of duplication therapy inthe patients. Duplication therapy results to increase in the bioavailability of the drugs and may result to renal toxicity and hepatotoxicity. The combination of sodium picosulphate, liquidparaffin, and milk of magnesia was given during the patient's discharge. Since milk of magnesia has pharmacokinetic interactions with many drugs such as Tramadol, Aceclofenac, Atenolol, and Levothyroxine, another class of laxative may be preferred. This study has some limitations. The

inclusion of a larger population in a prospective study is recommended to have a broader impact on the overall ovarian cancer patient population in India.

CONCLUSION

Treatment for ovarian cancer remains scares in Tamil Nadu. Our study reveals drug utilization, major Potential Drug-Drug Interactions, and polypharmacy among 100 ovarian cancer patients. Most of the interactions occurs between the drugs used in the cancer chemotherapy and its supportive treatment. The comorbidities and age factors result to polypharmacy. The total frequence of 1380 drugs were used by the patients. Out of these antineoplastic chemotherapy accounts about 12.2%, gastroprotective agents and anti-emetics were found 18.2% and 15.4%. Themost commonly prescribed antineoplastic chemotherapy were carboplatin and paclitaxel followedby gemcitabine. In our study, all the patients received polypharmacy during hospitalization. All patients received more than 8 drugs during hospitalization. Comorbidity and age factors result to polypharmacy in patients.

The incident of PDDIs was much higher in patients with comorbidity and polypharmacy. The majority of interaction was observed in patients using drugs ranges from 5 to 12. The severityof the PDDIs was classified into major (12%), moderate (48%), minor (30%). Under the risk rating,the drug combination should be avoided X (4.6%), consider therapy modification D (22.7%), monitor therapy C (39%), no action needed B (32.8%) and no known interaction A (0.09%). In addition to the reported PDDIs, Healthcare providers must adopt a multidisciplinary approach to monitor and manage drug interactions, involving Clinical pharmacists, physicians, and nursing staff to ensure patient safety.

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