IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

Assessment and Management of ADR Associated with Cancer Chemotherapy in a Tertiary Care Hospital

Kadeejath Thashrifa Shereen B[1*] ,Shama Banu KP[1], Karthik MM[1], Risvana Abdul Rahiman P[1] ,Suja C[2]

[1]PharmD interns, Cresent College of Pharmaceutical Sciences Kannur Kerala

[2]Principal , Cresent College of Pharmaceutical Sciences Kannur Kerala

ABSTRACT:

Aim: The objective of the study was to assess the causality, severity and preventability of ADRs detected by chemotherapeutic medications and to assess their management.

Methodology: A prospective observational study was conducted for 6 months among 108 patients.

Results: The study found a total of 263 ADRs, with the gastrointestinal system being the most affected organ system (28.6%).The drug Paclitaxel caused the highest number of ADRs when administered as monotherapy, while paclitaxel+carboplatin caused the highest number of ADRs when taken in combination. Causality was assessed using Naranjo's causality assessment scale, it was found that 87.1% of the ADRs were probable, 7.6% were possible, and 5.3% were definite. The severity of ADRs was assessed using the Hartwig & Siegal scale, and the study found that 49.8% of ADRs were moderate level 3, 34.6% were moderate level 4a, 10.3% were mild level 2, 4.2% were moderate level 4b, and 1.1% were mild level 1.The preventability of the ADRs was assessed using the Modified Schumock and Thornton preventability scale, it was found that 68.4% of ADRs were not preventable, 18.6% were probably preventable, and 12.9% were definitely preventable. The study also found that the ADRs were managed by providing additional treatment without changing the drug regimen.

Conclusion : ADRs are the major concern in patient safety and are responsible for a significant amount of mortality and morbidity, as well as financial burden on patients. It is essential to keep ADR in track, and early detection/ monitoring could help reduce the risk of one's health.

Key words: Adverse drug reaction, causality, chemotherapy, pharmacovigilance.

INTRODUCTION:

Cancer is a condition in which aberrant cells divide uncontrollably and infect the tissues around them .It is one of the leading causes of morbidity and mortality worldwide. The basic principle behind cancer treatment is to destroy or halt the uncontrolled proliferation of malignant cells. The normal cells of the body will be negatively damaged during the process of destroying actively dividing malignant cells, resulting in arrange of serious side effects. The

majority of patients experience physical, psychological, and social distress in addition to side effects and potential adverse drug reactions.[1]

Many cancer treatments are available. The treatment options depends on several factors, such as the type and stage of cancer, general health, and preferences.[2]

Chemotherapeutic chemicals come in a variety of forms and are used to treat cancer at various stages. Chemotherapy is a structured treatment regimen that uses anti neoplastic medicines to treat cancer. It is the only treatment that works in a systematic manner to eliminate the sickness from the entire body. These medication are usually used to treat rapidly dividing cells and are either cell cycle specific or not.[3]

Cancer chemotherapy is associated with the occurrence of adverse drug reactions, which adds to the global burden and can have serious implications. These ADRs must be monitored and reported in order to safeguard the patient.

Adverse Drug Reaction:

According to the World Health Organization (WHO), an **adverse drug reaction** is defined as "any unpleasant and undesired response to a drug that occurs at levels typically employed in man for disease prevention, diagnosis, or therapy, or for the modification of physiological function." Adverse drug responses are the major cause of death and morbidity in the medical field, and they have a significant financial impact on health-care resources.[4]

Many of the adverse effects of anti-neoplastic are a result of their therapeutic action, whichaffectsallrapidlydividingcellsandisnotlimitedtomalignantcells.Alopecia,nauseaand vomiting,myelosuppression,haemorrhagiccystitis,mucositis,enhancedtoxicitywithreducedrenal function, cardiac toxicity, hot flushes, electrolyte imbalance, and deep vein thrombosis are all common adverse drug reactions (ADRs)associatedwithcancertreatment.[5]

An important clinical issue, adverse medication responses account for 2-6 percent of all hospital admissions. According to recent polls in the United States, adverse medication events lengthen hospital stays and raise expenditures. The majority of adverse drug reactions (ADRs) with these pharmaceuticals go unreported due to healthcare providers' lack of understanding, a lack of time to report, and a shortage of staff in hospitals. As a result, it is critical to track the pattern of ADRs associated with anticancer medications in order to improve cancer patients 'quality of life and lower the cost of ADR-related hospitalisation.[6]

Pharmacovigilance:

The science of recognising, analysing, and preventing adverse drug reactions is known as "pharmacovigilance. ADRs can cause a patient's recovery to be delayed as well as hospitalization ,increasing the misery .With the marketing of thousands of pharmaceuticals each year and overzealous prescribing, it is critical that we identify ADRs as soon as possible and prevent them if at all possible, in order to ensure the patient's well-being at a reasonable cost. The International Drug Monitoring Program was established because the WHO recognized the importance of establishing an efficient, dynamic surveillance system track the occurrence of ADRs. In India, the Pharmacovigilance Program was established in 2010 with the goal of monitoring drug safety and compiling and adverse event database for our people. ADR monitoring and reporting programmes in hospitals can assist in identifying and analysing the dangers associated with drug use. This information could aid prescribers in

identifying ADRs and dealing with them more effectively, as well as preventing ADRs in the future. In India, ADR monitoring and reporting is still in its early stages. In the Indian subcontinent, a lack of a coordinated and efficient ADR monitoring and reporting programme is creating a significant obstacle to drug safety screening. Under-reporting of ADRs is primarily due to the prescriber's lack of awareness and fear of lawsuit.[7]

Cancer chemotherapy is associated with the occurrence of adverse drug reactions (ADRs), which adds to the global burden and can have serious implications. These ADRs must be monitored and reported in order to safeguard the patient and handle it appropriately .The outcome would raise awareness and prevent recurrence among the patients.

METHODOLOGY

Study design: A prospective observational study

Study setting: 500 bedded tertiary care hospital, Kannur, Kerala

Study duration: The study duration was 6months from January2022-June2022

Study population: Patients who are undergoing chemotherapy at the Department of Oncology, Tertiary care Hospital Kannur, Kerala.

Study procedure:

Detailed information regarding the study were given to the participants undergoing the treatment in the department of oncology in the tertiary care hospital. Informed consent form was obtained from the participants who was willing to participate. Predesigned case record form was used for the data collection. The case record form did not contain the patient name, in order to protect the patient's identity at all point of time. Patient's information regarding demographics, socioeconomic, life style and medication was collected from the patient medication profile.

Ethics and concerns:

Informed consent form was obtained from patients and the confidentiality of the subject was maintained and data was collected only after getting clearance from Ethics Committee. The study was approved by the Institutional Human Ethical Committee of Crescent College of Pharmaceutical Sciences filed under Ref No. 006/2021/CCOPS/IEC .Permission to conduct the study was obtained from the chairperson of the Institutional Human Ethical Committee.

RESULTS:

A prospective observational study was conducted for a period of 6 months in the Department of Oncology in a tertiary care hospital, Kannur. A total of 108 patients satisfying the inclusion criteria were included in the study.

1. DISTRIBUTION OF SAMPLE ACCORDING TO GENDER:

Out of 108 patients 35 (32.4%) patients were male and 73 (67.6%) patients were female. Thus in our study, Cancer was more common among females than male.

2. DISTRIBUTION OF SAMPLE ACCORDING TO AGE:

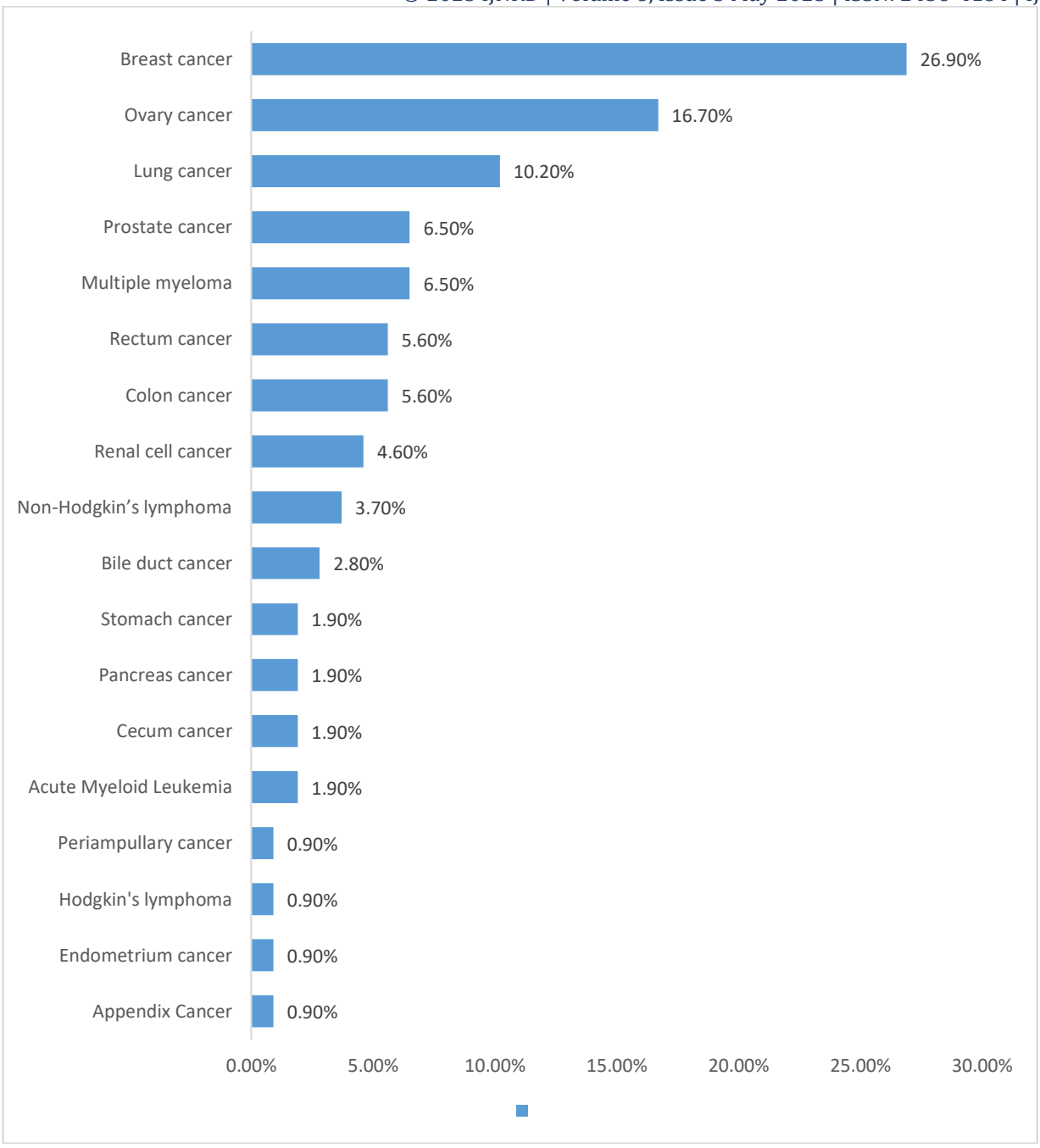
The age group of sample population was found to be in between 18 - 82 years. Out of 108 patients, 73(67.6%) patients belongs to 51-69 years age group, 18(16.7%) patients belongs to above 70 years age group, 16(14.8%) patients belongs to 35-50 years age group. And 1(0.9%) patients belongs to 18-34 years age group. Thus from our study we found that cancer was more prevalent in the age group51-69 years.

3. DISTRIBUTION OF CANCER AMONG THE STUDY POPULATION:

Out of 108 patients,29(26.9%) patients had breastcancer,18(16.7%)patients had ovary cancer ,11(10.2%) patients had lung cancer followed by 7 (6.5%) multiple myeloma ,7(6.5%) prostate cancer,6(5.6%) colon cancer, 6(5.6%)rectum cancer,5(4.6%)renal cellcancer,4(3.7%) non-Hodgkin's lymphoma,3(2.8%)bile duct cancer,2(1.9%)acute myeloidleukemia,2(1.9%)cecum cancer,2(1.9%)pancreas cancer,2(1.9%) stomachcancer,1(0.9%) appendix cancer,1(0.9%) endometrium cancer1(0.9%) Hodgkin's lymphoma 1(0.9%) periampullary cancer, 1 (0.9%).Thus from our study it has been found that breast cancer is more prevalent followed by ovary cancer.

Table1:Distribution pattern of cancer among the study population

SI.No	Typesofcancer	No of patients(n=108)	Percentage
1	Acute Myeloid Leukemia	2	1.9%
2	Appendix Cancer	1	0.9%
3	Bile duct cancer	3	2.8%
4	Breast cancer	29	26.9%
5	Cecum cancer	2	1.9%
6	Colon cancer	6	5.6%
7	Endometrium cancer	1	0.9%
8	Hodgkin's lymphoma	1	0.9%
9	Lung cancer	11	10.2%
10	Multiple myeloma	7	6.5%
11	Non-Hodgkin's lymphoma	4	3.7%
12	Ovary cancer	18	16.7%
13	Pancreas cancer	2	1.9%
14	Periampullary cancer	1	0.9%
15	Prostate cancer	7	6.5%
16	Rectum cancer	6	5.6%
17	Renal cell cancer	5	4.6%
18	Stomach cancer	2	1.9%



Fiqure1:Distribution pattern of cancer among study population

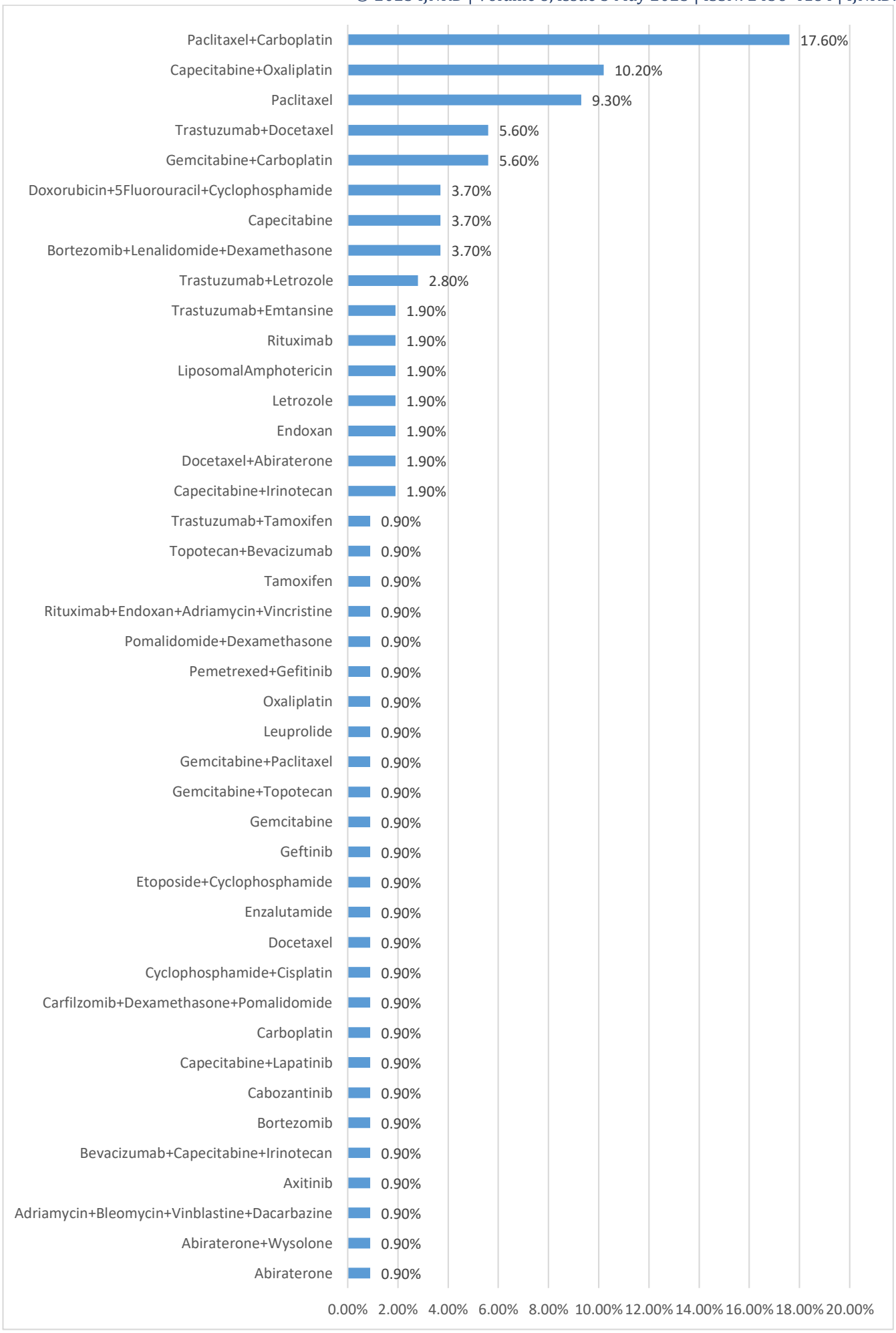
4. CHEMOTHERAPY REGIMEN PRESCRIBED AMONG PATIENTS

43 chemotherapy regimen prescribed in In our study it was found that out of 108prescriptions43chemotherapyregimenwerefollowed.The most common chemotherapy regimen prescribed was paclitaxel+carboplatin (17.6%) followed by CAPOX(capecitabine+oxaliplatin).

Table2:Pattern of chemotherapy regimen prescribed among patients

SI.No	Chemotherapyregimen	Frequency	Percentage
1	Pazopanib	1	0.9%
2	Abiraterone	1	0.9%
3	Abiraterone+Wysolone	1	0.9%
4	Adriamycin+Bleomycin+Vinblastine+Dacarbazine	1	0.9%
5	Axitinib	1	0.9%
6	Bevacizumab+Capecitabine+Irinotecan	1	0.9%
7	Bortezomib	1	0.9%
8	Bortezomib+Lenalidomide+Dexamethasone	4	3.7%
9	Cabozantinib	1	0.9%
10	Capecitabine	4	3.7%
11	Capecitabine+Lapatinib	1	0.9%
12	Capecitabine+Irinotecan	2	1.9%
13	Capecitabine+Oxaliplatin	11	10.2%
14	Carboplatin	1	0.9%
15	Carfilzomib+Dexamethasone+Pomalidomide	1	0.9%
16	Cyclophosphamide+Cisplatin	1	0.9%
17	Docetaxel	1	0.9%
18	Docetaxel+Abiraterone	2	1.9%
19	Doxorubicin+5Fluorouracil+Cyclophosphamide	4	3.7%
20	Endoxan	2	1.9%
21	Enzalutamide	1	0.9%
22	Etoposide+Cyclophosphamide	1	0.9%
23	Geftinib	1	0.9%
24	Gemcitabine	1	0.9%
25	Gemcitabine+Topotecan	1	0.9%
26	Gemcitabine+Carboplatin	6	5.6%
27	Gemcitabine+Paclitaxel	1	0.9%

28	Letrozole	2	1.9%
29	Leuprolide	1	0.9%
30	LiposomalAmphotericin	2	1.9%
31	Oxaliplatin	1	0.9%
32	Paclitaxel	10	9.3%
33	Paclitaxel+Carboplatin	19	17.6%
34	Pemetrexed+Gefitinib	1	0.9%
35	Pomalidomide+Dexamethasone	1	0.9%
36	Rituximab	2	1.9%
37	Rituximab+Endoxan+Adriamycin+Vincristine	1	0.9%
38	Tamoxifen	1	0.9%
39	Topotecan+Bevacizumab	1	0.9%
40	Trastuzumab+Docetaxel	6	5.6%
41	Trastuzumab+Emtansine	2	1.9%
42	Trastuzumab+Letrozole	3	2.8%
43	Trastuzumab+Tamoxifen	1	0.9%


Paclitaxel+Carboplatin 17.60%
Capecitabine+Oxaliplatin 10.20%
Paclitaxel 9.30%
Trastuzumab+Docetaxel 5.60%
Gemcitabine+Carboplatin 5.60%
Doxorubicin+5Fluorouracil+Cyclophosphamide 3.70%
Capecitabine 3.70%
Bortezomib+Lenalidomide+Dexamethasone 3.70%
Trastuzumab+Letrozole 2.80%
Trastuzumab+Emtansine 1.90%
Rituximab 1.90%
LiposomalAmphotericin 1.90%
Letrozole 1.90%
Endoxan 1.90%
Docetaxel+Abiraterone 1.90%
Capecitabine+Irinotecan 1.90%
Trastuzumab+Tamoxifen 0.90%
Topotecan+Bevacizumab 0.90%
Tamoxifen 0.90%
Rituximab+Endoxan+Adriamycin+Vincristine 0.90%
Pomalidomide+Dexamethasone 0.90%
Pemetrexed+Gefitinib 0.90%
Oxaliplatin 0.90%
Leuprolide 0.90%
Gemcitabine+Paclitaxel 0.90%
Gemcitabine+Topotecan 0.90%
Gemcitabine 0.90%
Geftinib 0.90%
Etoposide+Cyclophosphamide 0.90%
Enzalutamide 0.90%
Docetaxel 0.90%
Cyclophosphamide+Cisplatin 0.90%
Carfilzomib+Dexamethasone+Pomalidomide 0.90%
Carboplatin 0.90%
Capecitabine+Lapatinib 0.90%
Cabozantinib 0.90%
Bortezomib 0.90%
Bevacizumab+Capecitabine+Irinotecan 0.90%
Axitinib 0.90%
Adriamycin+Bleomycin+Vinblastine+Dacarbazine 0.90%
Abiraterone+Wysolone 0.90%
Abiraterone 0.90%
0.00% 2.00% 4.00% 6.00% 8.00% 10.00% 12.00% 14.00% 16.00% 18.00% 20.00%

5. ADR AND ORGAN SYSTEM AFFECTED

In our study a total of 263 ADR were identified and gastrointestinalsystem77(28.6%) was found to be the most affected organ system with ADRs such as nausea ,vomiting, constipation, gastric irritation, abdominal pain, anorexia,
diarrhoea,hematemesis,heartburn,salivation,gastritis,esophagitis,mucositisfollowedbyhematologicalabnormalities 56(21%). The other organ system affected were skin and appendages 21(7.7),respiratory 19(7%), endocrine 17(6.2%), sensory 6(2.1%), nervous 12(4.4%), renal 3(1%),liver 2(0.7%).The most commonly observed ADR was anemia 43(16.3%) followed bynausea,vomitingandfatigue

Table3:Distribution of ADR according to organ system

Organ system affected	ADR	Frequency	Percentage%
Nervous	Neuropathic pain	5	1.9
	Paresthesia	1	0.3
	Peripheral neuropathy	5	1.9
	Neurotoxicity	1	0.3
GI	Nausea	14	5.3
	Vomiting	14	5.3
	Salivation	1	0.3
	Gastritis	2	0.7
	Gastric irritation	11	4.1
	Esophagitis	1	0.3
	Diarrhea	5	1.9
	Constipation	13	4.9
	Abdominal pain	8	3.0
	Heartburn	2	0.7
	Anorexia	3	1.1
	Hematemesis	2	0.7
	Mucositis	1	0.3
Hematology	Anemia	43	16.3
	Leucopenia	6	2.2
	Neutropenia	6	2.2
	Thrombocytopenia	1	0.3
Skin and Appandages	Alopecia	8	3.0

	Itching	5	1.9
	Skin discoloration	2	0.7
	Nail discoloration	4	1.5
	Skin pigmentation	1	0.3
	Skin rashes	1	0.3
Musculoskeletal	Lower limb infection	2	0.7
	Lower limb swelling	3	1.1
	Hand foot syndrome	2	0.7
	Leg pain	1	0.3
	Back pain	1	0.3
	Body pain	1	0.3
Respiratory	Dyspnea	9	3.4
	Cough	7	2.6
	Orthopnea	1	0.3
	Hemoptysis	2	0.7
Endocrine	Dyselectrolytemia	1	0.3
	Hypokalemia	5	1.9
	Hyponatremia	9	3.4
	Hypocalcemia	1	0.3
	Hyperkalemia	1	0.3
Renal	Abnormal blood urea	2	0.7
	Incontinence	1	0.3
Sensory organs	Numbness	3	1.1
	Visual disturbances	1	0.3
	Dysgeusia	2	0.7
Others	Fatigue	14	5.3
	Infection	3	1.1
	Fever	2	0.7
	Insomnia	2	0.7
	Chills	2	0.7
	Systemic hypertension	1	0.3
	Weakness	6	2.2
	Pain	5	1.9
	Throat irritation	1	0.3
	Allergic reaction	2	0.7

	Fainting	1	0.3
	Aphthous ulcer	1	0.3
Liver	Increased liver enzyme	2	0.7

6. ADRs CAUSED BY DRUGS GIVEN AS MONO THERAPY :

In this study it was found that Paclitaxel is the drug which caused large number of ADRs (16) followed by Oxaliplatin(6) when given as mono therapy.

Table4 :Pattern of ADRs caused by drugs given as monotherapy

Monotherapeutic agents	Frequency of ADRs
Docetaxel	2
Leuprolide	1
Carboplatin	1
Enzalutamide	1
Geftinib	1
Tamoxifen	1
Cabozantinib	1
Bortezomib	2
Liposomal Amphotericin	2
Rituximab	2
Letrozole	2
Gemcitabine	2
Pazopanib	2
Axitinib	3
Endoxan	4
Abiraterone	5
Capecitabine	5
Oxaliplatin	6
Paclitaxel	16

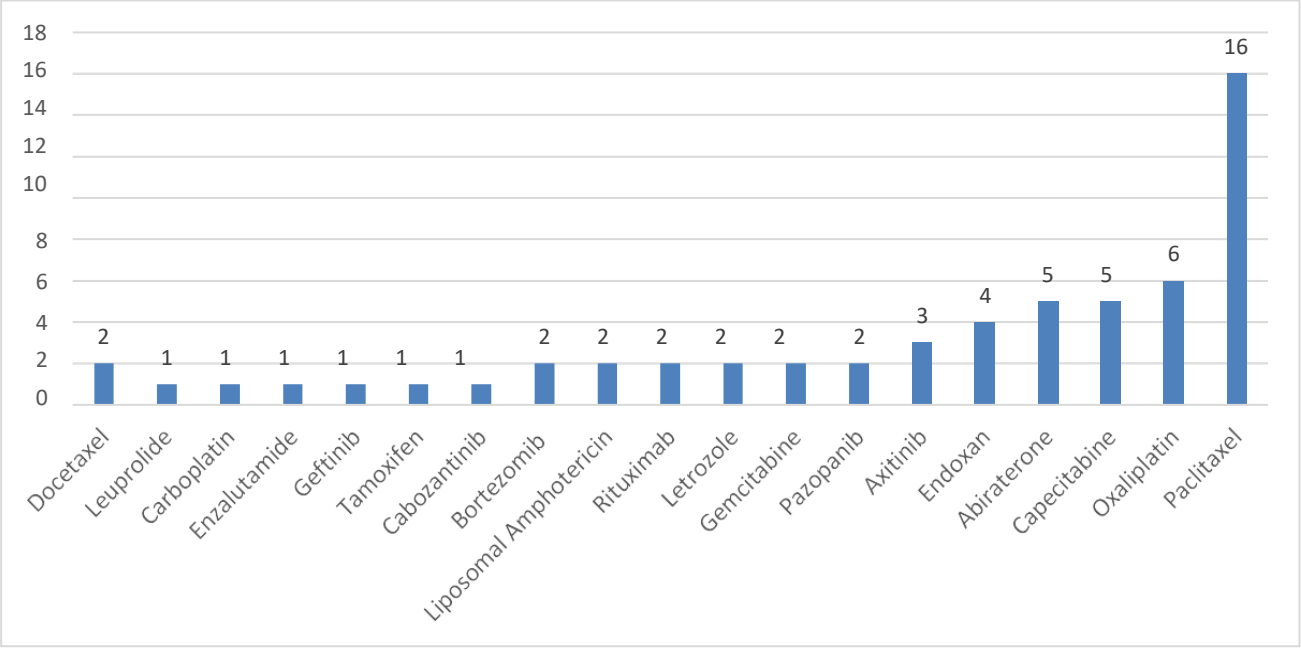


Figure3:Pattern of ADRs caused by drugs given as monotherapy

7. ADRs CAUSED BY DRUGS GIVEN IN COMBINATION:

In multiple therapy it was found from our study that Paclitaxel+Carboplatin caused large number of ADRs (53)followed by Capecitabine+Oxaliplatin(27).

Table5 :Pattern of ADRs caused by drugs givenin combination

Multipletherapy	**No ofADRs**
Abiraterone+Wysolone	1
Cyclophosphamide+Cisplatin	1
Gemcitabine+Topotecan	1
Pomalidomide+Dexamethasone	1
Trastuzumab+Tamoxifen	1
Docetaxel+Abiraterone	2
Pemetrexed+Gefitinib	2
Docetaxel+Abiraterone	3
Bevacizumab+Capecitabine+Irinotecan	3
Capecitabine+Lapatinib	3
Carfilzomib+Dexamethasone+Pomalidomide	3
Etoposide+Cyclophosphamide	3

Rituximab+Endoxan+Adriamycin+Vincristine	3
Adriamycin+Bleomycin+Vinblastine+Dacarbazine	4
Gemcitabine+Paclitaxel	4
Doxorubicin+5Fluorouracil+Cyclophosphamide	5
Topotecan+Bevacizumab	5
Capecitabine+Irinotecan	6
Bortezomib+Lenalidomide+Dexamethasone	7
Trastuzumab+Letrozole	10
Trastuzumab+Emtansine	11
Trastuzumab+Docetaxel	19
Gemcitabine+Carboplatin	26
Capecitabine+Oxaliplatin	27
Paclitaxel+Carboplatin	53

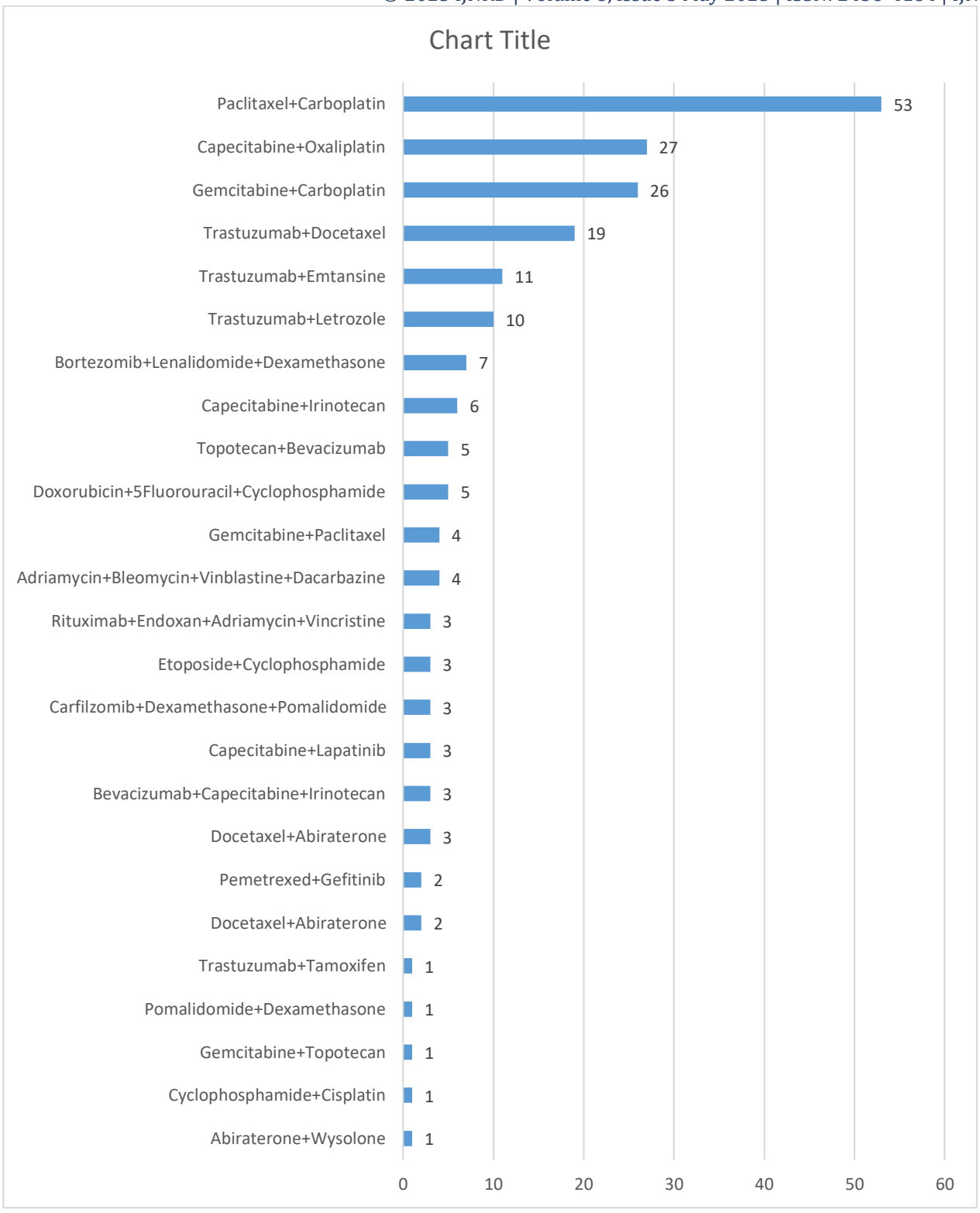


Figure4: Pattern of ADRs caused by drug given in combination

8. CAUSALITY ASSESSMENT OF ADRs:

In our study 229(87.1%) of the ADR was found to be probable,20 (7.6%) possible and14(5.3%) definite and this was assessed using Naranjo's causality assessment scale.

Table6: Causality assessment of ADRs by Naranjo'scale

Naranjo causality assessment scale	No of ADRs	Percentage
Definite	14	5.3%
Probable	229	87.1%
Possible	20	7.6%

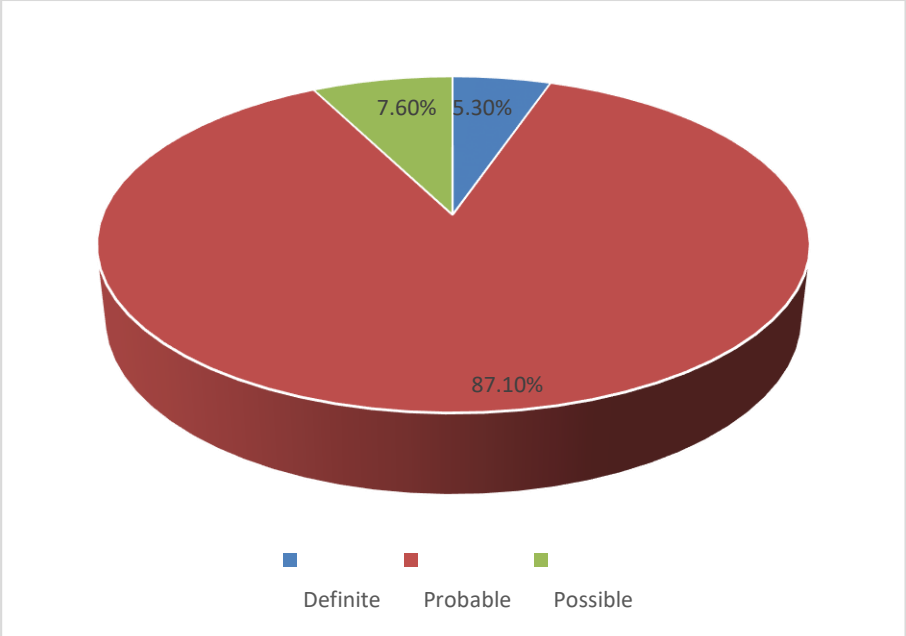


Figure5:Naranjo'scausality assessment scale

9. SEVERITYOFADRs:

The severity of ADR was assessed with the help of Hartwig & Siegal scale. In this study it is found that 131 (49.8%) of ADRs were moderate level 3, 91(34.6%) were moderate level 4a,27(10.3%) were mild level2,11(4.2%)were moderate level4b,and 3(1.1%)were mild level1.

Table7: Severity of ADRs by Hartwig and Siegal scale

Hartwig severity scale	No of ADRs	Percentage
Mild(L-1)	3	1.1%
Mild(L-2)	27	10.3%
Moderate(L-3)	131	49.8%
Moderate (L-4a)	91	34.6%
Moderate(L-4b)	11	4.2%

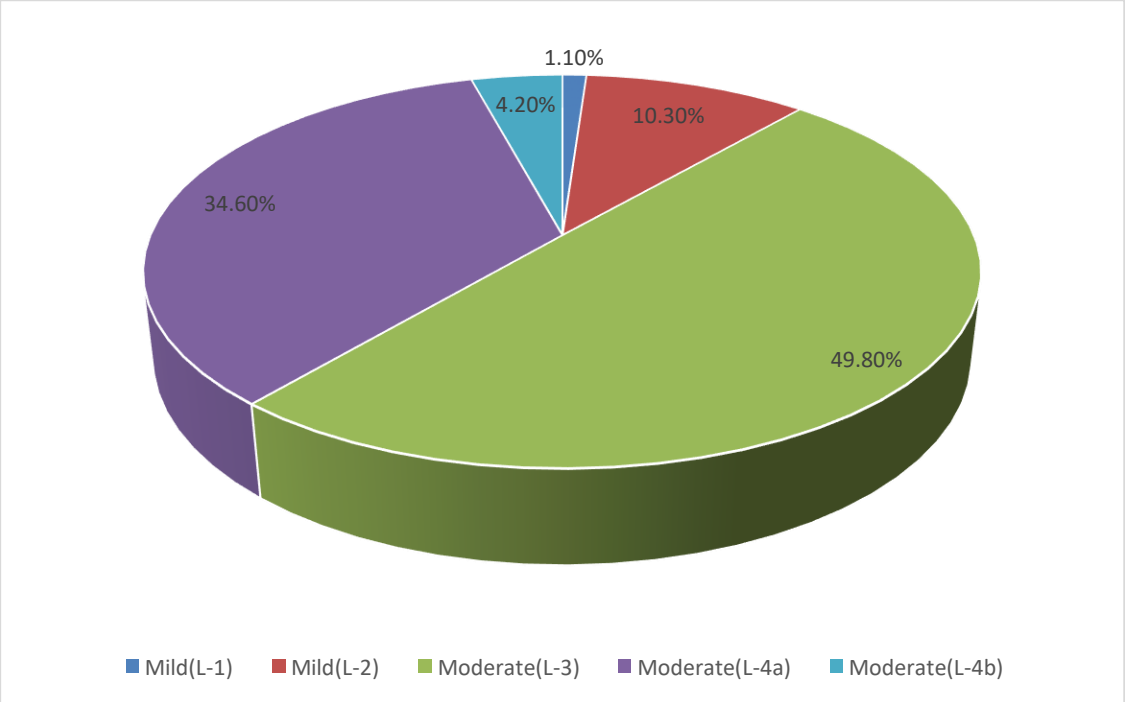


Figure6: Hartwig severity scale

10. PREVENTABILITY OF ADRs:

The preventability of the ADRs were assessed by using the Modified Schumock and Thornton preventability scale and It was found that 180(68.4%) ADRs were not preventable,49(18.6%) were probably preventable and 34(12.9%) were definitely preventable.

Table 8:PreventabilityofADRsbySchumockandThorntonscale

Schumock Thornton scale	No of ADRs	Percentage
Definitely preventable	34	12.9%
Probably preventable	49	18.6%
Not preventable	180	68.4%

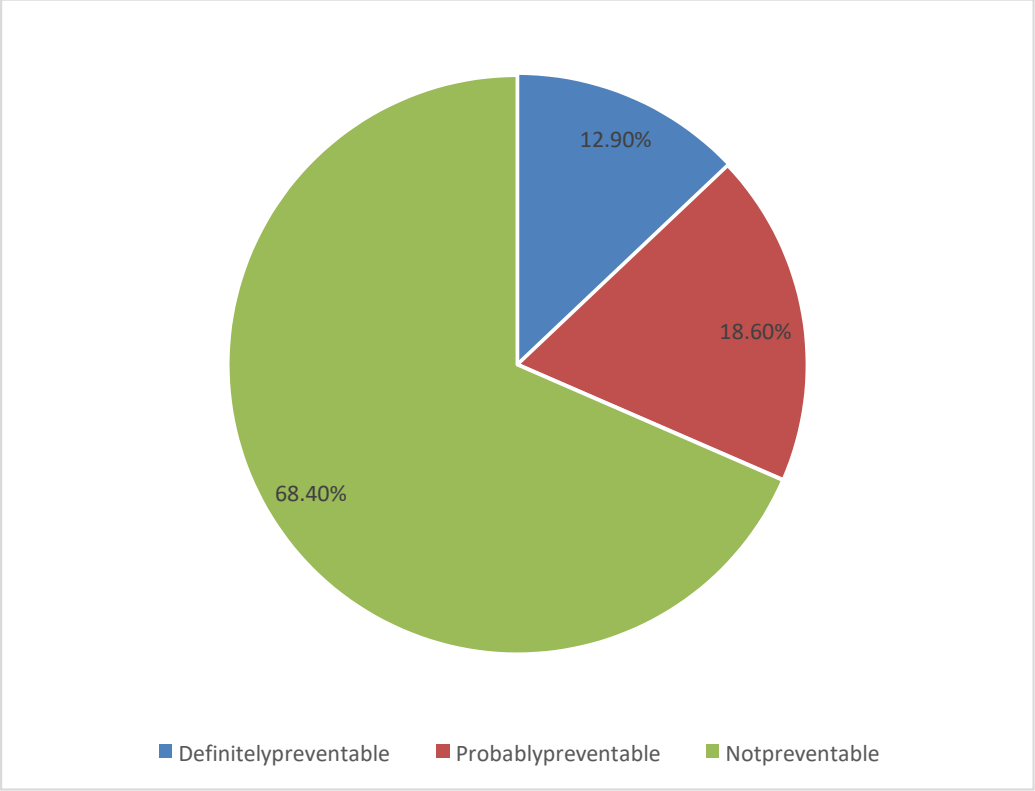


Figure7 :Schumock and Thornton scale.

11. ADR AND ITS MANAGEMENT:

In our study it was found that ADRs were managed by providing additional treatment without changing the drug regimen .Various classes of drugs were used to treat the ADRs caused by chemotherapy regimen as shown in tableno.11.

Table no.9: ADR's and it's management

Adverse reaction	Management
Neuropathic pain	Pregabalin75mg
Peripheral neuropathy	GabapentinPregabalin75mg
Nausea	Ondansetron4mg
Vomiting	Ondansetron4mg
Constipation	SypLactulose,TabBisacodyl5mg
Gastritis	Esomeprazole magnesiumtrihydrate40mg+DomperidoneIP 30mg,Omeprazole40mg
Gastric irritation	Pantoprazole40mg,,Omeprazole40mg
Esophagitis	Pantoprazole40mg
Diarrhoea	Loperamide2mg
Abdominal pain	Acetaminophen162.5mg+Tramadol18.75mg
Heartburn	Omeprazole40mg
Anorexia	Syrup Zincovit(multivitamin)
Mucositis	Brushing with a soft toothbrush,use of non medicated rinses (saline or sodium bicarbonate rinses)recommended
Anemia	PRBC transfusion, folic acid tablets
Leucopenia	Filgrastim injection
Neutropenia	Filgrastim injection
Thrombocytopenia	Prednisolone10mg
Alopecia	Capsor wigs
Itching	Hydrocortisonecream1%

Skin rashes	Betamethasone cream
Lower limb swelling	Ibuprofen200mg
Hand foot syndrome	Levofloxacin500mg
Leg pain	TabParacetamol650mg
Back pain	Analgesics(topical),Backrest
Body pain	Analgesics(topical),Tabparacetamol650mg
Dyspnea	Etofylline77mg+theophylline23mg
Cough	Syp TUSQ 5ml(Dextramethorphan Hydrobromide IP5mg,Chlorpheniramine MaleateIP2mg,PhenylephrineHydrochloide5mg)
Hypokalemia	Potassium chloride oral solution
Hyponatremia	Tolvaptantablet15mg,3%Sodiumchlorideinj
Hypocalcemia	Calcium gluconate and calcium lactobionate injection
Hyperkalemia	KBind Sachet
Numbness	Pregabalin75mg
Fatigue	Dietmodifications,if not subsided IVhydration
Infection	Cefuroxime500mg
Fever	Tabparacetamol650mg
Insomnia	Lorazepam0.25mg
Allergic reaction	Inj pheniramine maleate
Pain	Diclofenac50mg
Aphthous ulcer	GelCholineSalicylate9% w/v+Lidocainetopical2% w/v

DISCUSSION:

This study was done to determine the ADR profile and its management, to investigate the features of ADR including the drug classes that most usually cause ADRs, and to assess the causality severity and preventability of ADR reported .A total of 108 patients who meets inclusion criteria were included in the study. The study was conducted for a period of 6months.

Among 108 patients, 73 (67.6%) patients were female and 35 (32.4%) patients were male showing that females were predominant for the development of cancer because of the hormonal changes occurring during different stages of their life. This result was similar to the study done by SanijaP ***etal***[8].

Out of 108 patients, majority of the patients were of age group 51-69 years 73 patients (67.6%).This may be due to the etiological factors related to aging .Similar results were obtained in studies conducted by DeryaCinar ***etal***.[9], SanijaP ***etal***[8]. And was comparable with study conducted by Goyal ***etal.***[10]

In our study breast cancer 29 (26.9%) was found to be most prevalent followed by ovarycancer18(16.7%)and lung cancer 11(10.2%).This result was found to be comparable with the study done by Goyal ***et al***.[10] in which predominant types was lung cancer (22.86%) and breast cancer(18.1%).This result was similar to the study done by SanijaP***etal***.[8]

The most common chemotherapy regimen prescribed was paclitaxel+carboplatin(17.6%).In monotherapy, paclitaxel was found to be the drug which caused more number of ADRs(16).This result was similar to the study conducted by Vinod kumar Mugada ***et al.***[11] Among drug combination paclitaxel + carboplatin was found to cause large number of ADRs(53).The result was found comparable with the study conducted by Khandelwal***etal***.[12]

A total of 263 ADRs were identified among108patients who received chemotherapy.

The most commonly affected organ system by chemotherapy induced ADRs was gastrointestinal system 77 (28.6%).The result was found comparable with the study conducted by Thapaliya ***et al***.[13] It was in contradiction with the study carried out in South India by Khandelwal ***etal.***[12] since It has shown hematological system was mostly affected one.

The causal association of ADRs with the aid of Naranjos causality assessment scale, we observed that 229 (87.1%) of the ADR were probable, 20 (7.6%) were possible and 14 (5.3%) were definite. With the use of the same scale, two other studies reported (100%) and (61%) of

Probable scores for causality which was done by Goyal ***et al***.[10] SinghS ***et al***.[14]

Analysis of the severity of ADRs using the Modified Hartwig&Siegal scale shown that 131(49.8%) of ADRs were moderatelevel3, 91 (34.6%) were moderatelevel4a,27 (10.3%) were mild level 2,11(4.2%) were moderate level 4b, and 3 (1.1%) were mild level 1 and it is similar to a study conducted by Kishore ***etal***.[15]

Assessment of the preventability of ADRs by the Modified Schumock and Thornton preventability scale showed that 180(68.4%) ADRs were notpreventable,49(18.6%)were probably preventable and 34 (12.9%) were definitely preventable. In contrast to this,Sharma ***et al***.[16] found that 30.8% of ADRs were definitely preventable and Wahlang ***et al***.[17] found that 45.3% of ADRs were probably preventable.

In our study it was found that ADRs were managed by providing additional treatment without changing the drug regimen .Various classes of drugs were used to treat the ADRs caused by chemotherapy regimen and certain premedication was given before the initiation of chemotherapy to reduce the severity of ADR.

It was found from our study that before initiation of chemotherapy, parenteral dexamethasone, ranitidine, ondansetron, ,polybion injection, pheniramine maleate were mostly administered as pre-medication. Combination of calcium gluconate and calcium lactobionate injection was given as post medication. Filgrastim, blood transfusion, vitaminB12 andiron preparations were given for the management of haematological ADRs.

Antiemetics such as ondansetron and domperidone were used in emesis. Loperamide were given for diarrhoea, lactulose syrup, bisacodyl tablet for constipation was given where as normal saline, topvaptan tablet and parenteral preparation of potassium and calcium chloride for the electrolyte imbalance. Analgesics such as acetaminophen, combination of Tramadol and acetaminophen and diclofenac sodium were prescribed for pain management. Pregabalin and Gabapentin was given for neuropathic pain, Levofloxacin for hand foot syndrome,Vitamin B complex and multivitamin tablets were used for the symptomatic relief of anorexia.

CONCLUSION:

Patient safety has become a worldwide concern in recent years. ADRs are the leading causes of morbidity and mortality, putting a financial strain on patients and society. The primary responsibility of this is to keep track of ADRs. Early detection and monitoring of ADR could assist to reduce the risks to one's health. In this study, we have assessed the adr and it's management associated with cancer chemotherapy in 108 patients. Out of 108 patients included in the study, the occurrence of cancer were more in female than in male within an age group of 51-69 years. Majority of patients were diagnosed with carcinoma of breast .The most common chemotherapy regimen prescribed was paclitaxel+carboplatin. A total of 263ADRs were detected in 108 patients. Gastrointestinal system was found to be the most affected organ system. Anemia was the most common adverse effect found. Paclitaxel was the drug which caused more number of ADRs when administered as mono therapy. Paclitaxel + carboplatin was the drug that caused more number of ADRs when taken in combination. Causality, severity and preventability was assessed using Naranjo's causality assessment scale, Hartwig and Siegel scale and Modified Schumock and Thornton preventability scale respectively. The majority of ADRs was found to be probable with moderate severity which were not preventable.

Thus we conclude from our study clinical pharmacists can play a critical role in reducing the occurrence of ADRs by collaborating with the health-care team to detect and prevent them early, as well as assisting in the management of suspected ADRs .ADRs were managed by providing additional treatment without changing the drug regimen .Various classes of drugs were used to treat the ADRs caused by chemotherapy regimen and certain premedication as well as post medication were before the initiation and after the administration of chemotherapy to reduce the severity of ADRs.

An effective ADR-reporting programme could help to reduce ADRs and provide improved patient care. The Pharmacovigilance studies in oncology are required due to the limited therapeutic index of cancer medicines.

REFERENCE:

1. Nandakumar *et al*. Oncopharmacists: The Game Changers in Cancer Therapy. Journal of Young Pharmacists, Jan-March;2020;12(1):15–17.

2 https://www.mayoclinic.org/tests-procedures/cancer-treatment/about/pac-20393344.Accessed on 2022 may 27.

3 AsmatanzeemBepari *et al*. The Assessment of Drug Utilization Study of Anticancer Drugs Using WHOPrescribing Indicators in a Government Tertiary Care Hospital of the Hyderabad - Karnataka Region of India. Open Access Macedonian Journal of Medical Sciences.2019 Apr 15;7(7):1203-1208.

4 Javedh Shareef *etal*. A study on assessment of adverse drug reactions in patients with Tuberculosis in a tertiary care teaching hospital. Journal of Applied Pharmaceutical Science 2017 Nov 21;8(04):99–104.

5 Sneegdha Poddar *et al*. Pattern of adverse drug reactions due to cancer chemotherapy in tertiary care teaching hospital in Bangladesh. Dhaka University Journal of Pharmaceutical Sciences.2009 June;8(1):11–16.

6 G.Meghana1 , B.Pratapreddy *et al*. Pattern of Adverse Drug Reactions and Its Management in Female Cancer Patients in a Private Hospital in Telangana India .Asian Journal of Pharmaceutical research and Development.2018 Aug 20; 6 (4):45-53.

7 Ajitha Sharma *et al* of adverse drug reactions due to cancer chemotherapy in a tertiary care hospital in South India. Perspectives in Clinical Research, 2015 April-June ;6(2):109–115.

8 SanijaP1,Nandakumar UP1,JayaramShettyK *et al*. Adverse Drug Reactions and its Management Associated with Cancer Chemotherapy. International Journal of Research in Pharmaceutical Sciences. 2020 August 08; 11(4):5828-5835.

9 Derya Cinar *et al.* Cancer in the elderly. NorthclinIstanbul.2015;2(1);73-80.

10 Goyal.Y N *et al*. Pattern of ADRs due to cancer chemotherapy in a tertiary care hospital in Gujarat. International Journal of Scientific Research.2015;3(1):333-355.

11 Vinodh kumar Mugada *et al.*Chemotherapy Induced Adverse Drug Reactions In Cancer Patients. International Journal of Pharma Research.2017 October 30;8(2):71-76.

12 Khandelwal*et al*. Adverse drug reaction profile of cancer patients on chemotherapy in a tertiary care hospital .International Journal of Pharma and Bioscience.2015;6(2):233-244.

13 Thapaliya*et al*. Study of pattern of ADRs due to cancer chemotherapy and their management in hospitalized patients in BP koirala Memorial Cancer Hospital. Journal of Chitwan Medical College .2015 January; 4(4):24-28.

14 Singh S *et al*. Pattern of ADRs to anticancer drugs: A qualitative and quantitative analysis. Indian Journal Medical Pediatrics .2017;38(150):5

15 Kishore P *et al*. Pattern of ADRs and its management in female cancer patients in a private hospital Thalangana India. Asian Journal of Pharmaceutical Research.2018;6:45-53.

16 Sharma A *et al*. Pattern of ADRs due to cancer chemotherapy in a tertiary care hospital in South India. Perspect Clinical Research.2015;8(1):109-115

17 Wahlang J B *et al*. ADRs due to cancer chemotherapy in a tertiary care hospital.Therapeutic Advance in Drug Safety.2017;8:40-51.