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Analysis of Prescription Pattern of Drugs Among Oncology Patients in a Tertiary Care Teaching Hospital

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ABSTRACT

Cancer demands a timely diagnosis and proper management for a better clinical outcome. There are many anti-neoplastic agents and regimens available for the treatment of cancer, with variable response rates and adverse drug reactions (ADRs). So the proper selection of anti-neoplastic drugs and treatment regimens are crucial to ensure a better prognosis. The main objectives of the study were to analyze the prescription pattern among cancer patients and to identify the presence of external risk factors among them. A prospective, cross – sectional and descriptive study was conducted among 100 cancer patients for a period of 6 months. The data collected were analyzed for evaluating the prescription pattern and to identify the external risk factors that might have led to the development of different types of cancers. Among the patients involved in the study, 32 were male and 68 were female and majority of the patients belonged to the age group of 31-75 years. Risk factors like smoking, alcohol, tobacco and betel nut were identified among the patients. An assessment of relationship between risk factors and various types of cancers was performed which demonstrated a significant association between lung cancer and smoking. It was also found that smoking and alcohol consumption was related to esophageal cancer. The most commonly used antineoplastic agents were cyclophosphamide, Doxorubicin, 5-Fluorouracil and paclitaxel. Agents like Proton pump inhibitors, anti-emetics and analgesics were also used among the patients as pre-medications and adjuvant drugs to prevent and treat ADRs associated with the use of antineoplastic drugs.

Key words: Cancer, Chemotherapy, Antineoplastic agents, Risk factors

INTRODUCTION

Cancer is a term which is used to describe the condition in which there is abnormal cell growth and proliferation. It is one of the leading cause of death worldwide and it requires timely diagnosis and proper management to increase the life expectancy [1]. There are different treatment options available for cancer like chemotherapy, immunotherapy, radiation therapy, surgery, etc. among which chemotherapy is considered as the mainstay in the management of cancer [2]. Chemotherapy refers to the use of cytotoxic drugs that has the ability to kill cancer cells. These drugs are called anti-neoplastic agents. Chemotherapy may be combined with other treatment options like radiotherapy or surgery [3].

There are many anti-neoplastic agents and regimens available for the treatment of cancer, with variable response rates and ADRs [4]. So the proper selection of anti-neoplastic drugs and treatment regimens are crucial to ensure a better prognosis. The main objectives of the study were to analyze the prescription pattern among cancer patients and to identify the presence of external risk factors among them. Analysis of prescription pattern among cancer patients mainly involves determining the drugs that are prescribed and used in these patients. In this study, the drugs prescribed in the patients are divided into three categories, which are Pre-medications, antineoplastic drugs and adjuvant agents. While antineoplastic agents are cytotoxic drugs that kills the cancer cells, pre-medications and adjuvant agents are used to manage the symptoms and to prevent or treat the ADRs that are associated with the use of anti-cancer drugs. This study mainly focus on determining the antineoplastic drugs which are commonly prescribed according to the type of cancer and to analyze the efficacy of pre-medications and adjuvants drugs in preventing and treating the adverse drugs reactions resulting from the use of antineoplastic drugs.

METHODS

A prospective, cross-sectional and descriptive study was conducted among 100 patients of either sex for a period of 6 months at SSIMS & RC, Davangere, Karnataka. Ethical Approval was obtained from the Institutional Ethics Committee before the initiation of the study (BPC/IEC No. 90/2022-23). This study included patients above the age of 18 years who were clinically diagnosed with cancer and prescribed with at least one antineoplastic drug. Pregnant and lactating women, patients with concurrent psychiatric illness, and patients unwilling to participate were excluded from the study. The data was collected using a well-structured data collection form which consists of – demographic status, management including Pre-medications, Anti – neoplastic drugs and adjuvant therapy. Details relevant to the study were obtained from patient case sheets, treatment charts and also by interviewing the patients. Data on demographics, patient history, diagnosis and treatment were collected and recorded. The data was collected after obtaining written consent from the study participants. Then these data were analyzed to evaluate the prescription pattern and to identify the risk factors that might have led to the development of different types of cancers. The drugs prescribed in the patients undergoing chemotherapy were divided into three categories: pre-medications, antineoplastic agents and adjuvant drugs. External risk factors were identified among the patients and their relation with the respective type of cancer was analyzed using chi-square test and Fisher's test.

RESULTS AND DISCUSSION

A total of 100 patients were included in the study among which 32 were male and 68 were female and majority of the patients belonged to the age group of 31-75 years demonstrating a higher incidence of cancer among this age group. Age is the most important risk factor for cancer in general. According to the most recent statistics from the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) Program, the median age of cancer diagnosis is 66 years. Out of the total study population, breast cancer was found to be most prevalent type (40%), followed by ovarian (20%) and colon cancer (11%). This result was found to be similar to the study conducted by Sandeep kumar Kamalekar et.al. [10] Other types of cancer found among the patients were carcinoma of esophagus (6%), lungs (5%), anus (4%), cervix (3%) and so on. An attempt was made to identify the exposure to risk factors among the study participants and it was found that 13% had a history of smoking and of chewing betel nut. 5% of the study subjects had a habit of chewing tobacco and 5% had the history of alcohol consumption. An assessment of

relationship between risk factors and various types of cancer was performed using Chi square test and Fisher's exact test, which demonstrated a significant association between lung cancer and smoking (P value= 0.004). It was also found that smoking and alcohol consumption were related to the development of esophageal cancer (P value =0.004) (Table 1).

Table 1. Relationship between risk factors and cancer

Cancer Type	Risk Factor	Percentage (%) n=100	P
CA Breast	Smoking	1	0.0613
CA Esophagus	Smoking	4	0.004
	Alcohol	2	
Colon cancer	Smoking	1	0.174
	Alcohol	2	
CA Tongue	Tobacco	2	
	Betel nut	1	
Anal cancer	Tobacco	1	
Lung cancer	Smoking	5	0.004
Hepatocellular carcinoma	Alcohol	1	

The patients included in the study were treated with chemotherapy alone or chemotherapy in combination with surgery or radiotherapy. Following a detailed examination of the prescription pattern, it was discovered that the treatment strategy in patients undergoing chemotherapy included pre-medications, antineoplastic medicines, and adjuvant therapy. Pre-medications are those which are given before starting antineoplastics with an intention to prevent the anticipated ADRs.

Table 2. Pre-medications Used in Cancer Patients

Pre-medications	Percentage (%)
Ranitidine	95
Promethazine	94
Dexamethazone	94
Ondansetron	94
Domperidone + pantoprazole	15
Pantoprazole	13
Lorazepam	2
Magnesium sulphate	1

The drugs which were commonly used as pre-medications among the patients included ranitidine (95%), promethazine (94%), dexamethasone (94%) and ondansetron (94%). Other drugs which were used as pre-medications include lorazepam (2%), magnesium sulphate (1%), and pantoprazole (13%) (Table 2). [5] This observation was in accordance with the study conducted by Mrayam Taghizadeh – Ghehi et al and Manichavasagam M et al. These agents were found effective amon g the study sparticipants and were able to prevent most commonly expected ADRs like nausea, vomiting and gastric irritation in majority of the study participants. The most commonly prescribed antineoplastic drugs among the patients were cyclophosphamide (41%), doxorubicin (40%), 5-fluorouracil (31%), and paclitaxel (30%). The choice of the antineoplastic agent varied depending on the type of cancer (Table 3).

Table 3: Antineoplastic agents used in different types of cancer		
Antineoplastic agent	**Cancer Type**	**Percentage (%)**
Cyclophosphamide	Breast cancer	41
Doxorubicin	Breast cancer	40
5-Fluorouracil	Breast cancer, Anal cancer, Tongue cancer	31
Carboplatin	Ovarian cancer, Endometrial cancer, CA tongue, Lung cancer	28
Paclitaxel	Ovarian cancer, Esophageal cancer, Cervical cancer, Lung cancer, Carcinoma of pyriform fossa, Basal cellcancer	30
Cisplatin	Ovarian cancer, Esophageal cancer, Cervical cancer, Hepatocellular Carcinoma, Carcinoma of pyriform fossa, Basal cell cancer	16
Etoposide	Ovarian cancer	1
Methotrexate	Invasive mole	1
Oxaliplatin	Colon cancer	14
Gemcitabine	Hepatocellular Carcinoma, Anal cancer	1
Bleomycin	Ovarian cancer	1

While cyclophosphamide, 5- Fluorouracil, doxorubicin were drugs used for breast cancer, carboplatin, cisplatin and paclitaxel were used for ovarian cancer. Oxaliplatin was used in colon cancer and the drugs used in lung cancer were carboplatin and paclitaxel. The increased use of cyclophosphamide, doxorubicin, 5-Fluorouracil can be correlated with the increased prevalence of breast cancer among the patients. The drugs commonly used as adjuvant agents included pantoprazole (96%), IV fluids (96%), and vitamin supplements (91%) followed by ondansetron (89%), domperidone (82%) (Table 4).

Table 4: Adjuvant drugs	
Adjuvant therapy	**Percentage (%)**
IV Fluids	96
Magnesium sulphate	20
Potassium chloride	16
Ondansetron	89
Domperidone	82
Ranitidine	8
Pantoprazole	96
Mannitol	35
Morphine	2
Tramadol	5
Paracetamol	4
Pregabalin	2
Vitamin supplements	91

The adjuvant therapy played a significant role among the cancer patients. They were given either to treat the symptoms associated with cancer or to manage ADRs associated with the use of anti-neoplastic agents. PPIs were given to avoid gastric irritation in the patients and anti-emetics like ondansetron were used to treat vomiting. Analgesics like morphine, tramadol were also given to manage the pain associated with cancer.

CONCLUSION

Risk factors like smoking, alcohol consumption, tobacco, etc. were identified among the patients and significant associations were observed between certain types of cancer and the risk factors. Among the drugs prescribed the most commonly used antineoplastic agents were Cyclophosphamide, Doxorubicin, 5-Fluorouracil, carboplatin and paclitaxel. Apart from these agents, PPIs, H2RAs (H2 receptor antagonists), anti-emetics and analgesics were also used among the patients. It was observed that the pre-medications and adjuvant agents contributed a lot to the prevention of most of ADRs among the patients and the ADRs which occurred among the patients were effectively treated with the help of appropriate agents.

Declaration by Authors

Ethical Approval: Approved

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