

Original Article

THE IMPORTANCE OF ANTIBIOTICS IN A VARIOUS UNIQUE METASTASIS ALONG WITH CYTOTOXIC THERAPY AT TERTIARY CARE HOSPITAL: A PROSPECTIVE COHORT STUDY

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ABSTRACT

Objective: Rare cancers are creating a massive challenge to the world. It has associated with genetic mutations or socio-environmental factors, which includes genes, smoking, alcohol, ionizing radiation exposure, organic-inorganic chemicals, air and water pollution, viruses, and bacteria. When 15 cases per 1,00,000 people per year, we can consider it as a rare case as per the National Cancer Institute

This study aim is the importance of antibiotics in various unique metastasis along with cytotoxic therapy at tertiary care hospital.

Methods: The inclusion criteria of our study include a person who is suffering from rare metastasis at an early stage. We excluded the data that are those who are suffering from the typical type of cancers, multiple co-morbid conditions. This study was carried out the Prospective Cohort Study conducted between June 2018 to March 2020.

Results: Number of 20 rare cancers we consider for final analysis, the overall antibiotics use in this study 18 antibiotics they prescribed in overall cases, prescribed cytotoxic drugs are 23. the chi-square test value is $P=0.001$, the confidence interval(CI) is 95%, the likelihood ratio is 54.4, odd's ratio is 2.0(CI 95%, $P=0.711$), Male patients more than the female patients.

Conclusion: Cancer is a complex disorder, which is occurred through gene proliferation and socio-environmental factors. Rare metastasis is challenging to physicians and patients, however as per our observation, cytotoxic therapy with antibiotics can reduce the risk of rare metastasis and as well improved therapeutic adhesion, and we need clear supporting evidence on it through clinical trials.

Keywords: Rare cancers, Cytotoxic therapy, Antibiotic utilization

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INTRODUCTION

Cancers is a complicative disorder. Rare cancers are creating a massive challenge to the world [1], generally associated with genetic mutations or socio-environmental factors, which includes genes, smoking, alcohol, ionizing radiation exposure, organic-inorganic chemicals, air and water pollution, viruses, and bacteria [2]. Some organizations entrusted are there to provide comprehensive care to patients and improve the life expectancy of the survivors [3]. Each type of cancer has a specific biomarker observed in the body; for example, Burkitt's lymphoma occurs due to over expression of an MYC-c [4]. The Cancer mortality rate in India has doubled from 1990 to 2016 [5]. India's cancer incidence estimated that 1.1million new patients in 2018, and prognosticate to almost doubled up as a result of demographic transitions alone by 2040 [6]. Rare metastasis is a unique nature, which is a challenge to the physicians and their patients to diagnose their patients to prevent the disease. When 15 cases per 1,00,000 people per year, we can consider it as a rare case as per the National Cancer Institute [7].

Moreover, various cytotoxic therapies are available for different kinds of metastasis [8]. Often observed cytotoxic side effects such as nausea, vomiting, alopecia, gastrointestinal disturbances [9]. During the cytotoxic therapy, physicians prescribe antibiotics, antivirals [10], antifungal [11]. However, Physicians prescribe antibiotics based on the patient's immune system, condition, severity, and etiological factors considered. Most of the Chemotherapy protocols are decreasing the white blood cells(WBC), which fight against microbiota [12]. If we are prescribing antibiotics continuously to a patient may get antibiotic resistance, which is the world's biggest problem and WBC cells unable to fight against microbes [13]. It is profoundly impacting the therapeutic adhesion and as well typical to handle the infection condition if it may develop.

MATERIALS AND METHODS

Study design

This study was carried out the Prospective Cohort Study conducted between June 2018 to March 2020. At the Department of Oncology, Manipal super speciality hospital, Tadepalli, Vijayawada, Andhra Pradesh.

Data Collected from the oncology ward. We have received around 2000 different types of oncology cases that excluded the data that are those who are suffering from the typical type of cancers, multiple co-morbid conditions. The inclusion criteria of our study include a person who is suffering from rare metastasis at an early stage. We evaluated that cancer cases utilization of antibiotics, along with the treatment. We divided into two antibiotics exposure groups and non-exposure groups; we consider as group one is an antibiotic exposure group with rare cancers, and group 2 is a non-exposure group; it means non-antibiotics exposure.

Statistic considerations

We collected unique cancer cases, and the collected rare metastasis data extracted analysed from Statistical Package for The Social Sciences (SPSS-ver-26). The statistical approach of the study is Descriptive statistics, Chi-square test, correlation, ANOVA, odds ratio (OR).

RESULTS

The data shows that rare cancer cases are recorded (N=20), table 1 describes the gender distribution that represents male patients(N=14) are more than Female patients (N=6). Most of the rare cancers are observed in male patients. The most common type of chief complaint is fever(3~15%); later on, abdominal pain (2~10%) in figure-1we can be observed.

Table 1: Gender distribution

Gender	Frequency	Percent
F	6	18.2
M	14	42.4

Table 2 describes the descriptive statistics of each parameter we take. The mean and standard error mean (SEM) of each parameter as follows age 43.65±5.208 (N=20), Hemoglobin 9.5±0.56 (N=18), Creatinine 0.75±0.74(N=11), Total bilirubin 0.67±0.25(N=10)

Direct bilirubin 0.33±0.139 (N=10), Indirect bilirubin 0.34±0.37, SGOT 41±15(N=10), SGPT 41±15(N=10), platelet count 203266±49218 (N=15), white blood cells 6607±1092(N=14) respectively.

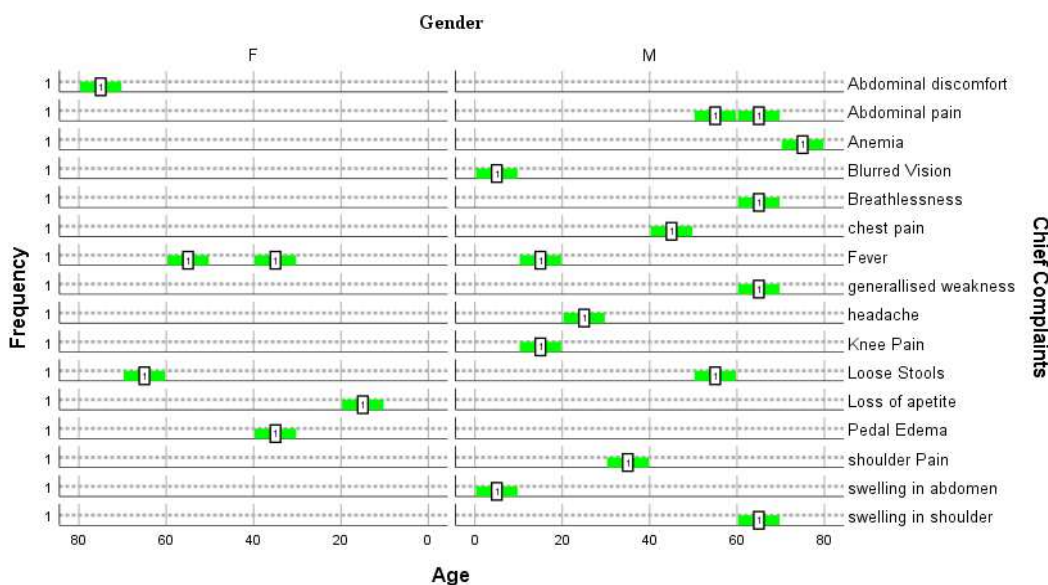


Fig. 1: The histogram describes gender. vs. age. vs. frequency of chief complaints

During the study period we observed very unique characteristics of each individuals, those are Pancreatic carcinoma(15%), Acute myeloid leukemia(15%), Burkitt's lymphoma(10%), Wilms tumor(5%), Soft tissue sarcoma(5%), stomach cancer(5%), Hepatoblastoma (5%),

Retinoblastoma (5%), Mediastinal tumor(5%), Relapsed multiple myeloma(5%), Medulloblastoma(5%), osteosarcoma(5%), ovary carcinoma(5%). The fig. 2 describes the how many patients are suffering from different type unique metastasis.

Table 2: Descriptive statistics of each parameter

Parameters	N	Mean	Std. deviation	Variance	Skewness	F		
		Statistic					Std. error	
Age	20	43.65	5.208	23.293	542.555	-0.453	.512	2.312
Creatinine	11	.7527	.07470	.24775	.061	1.226	.661	0.435
Direct Bilirubin	10	.3340	.13946	.44101	.194	2.895	.687	0.001
Hemoglobin	18	9.5722	.56446	2.39480	5.735	.360	.536	0.582
Indirect Bilirubin	10	.3340	.11798	.37310	.139	2.254	.687	0.001
Platelet count	15	203266.6667	49218.49504	190622.41161	36336903809.524	.816	.580	0.001
SGOT	10	41.4000	15.90891	50.30838	2530.933	2.305	.687	0.121
SGPT	10	26.5000	5.46555	17.28358	298.722	1.401	.687	3.374
Total Bilirubin	10	.6740	.25213	.79729	.636	2.757	.687	118
WBC	14	6607.1429	1092.10273	4086.27426	16697637.363	.251	.597	100

Table 3a explains the prescribed cytotoxic drugs while in treatment most widely used drug is vincristine(4~12.1%), Carboplatin (2~6.1%), cisplatin (2~6.1%), cytarabine(2~6.1%), Zoledronic acid(2~6.1%), Decitabine(1~3%), Dexamethasone(1~3%), Doxorubicin(1~3%), etoposide(1~3%), Folfirinnox(1~3%), ifosfamide(1~3%), Methotrexate(1~3%), octreotide acetate(1~3%), rituximab(1~3%).

Table 3b describes the antibiotic utilization while in the treatment mostly used antibiotics are Acyclovir (4~12.1%), meropenem

(2~6.1%), sulfamethoxazole trimethoprim (2~6.1%), voriconazole(2~6.1%), Actinomycin (1~3.0%), Amikacin (1~3.0%), fluconazole (1~3.0%), metronidazole (1~3.0%), polymyxin E(1~3.0%), tigecycline (1~3.0%), vancomycin (1~3.0%). The chi-square test value is 119 (DF=12, P=0.001), the confidence interval (CI) is 95%, the likelihood ratio is 54.4, odd's ratio is 2.0(CI 95%, P=0.711) (if odds ratio>1 that exposure is an only group one).

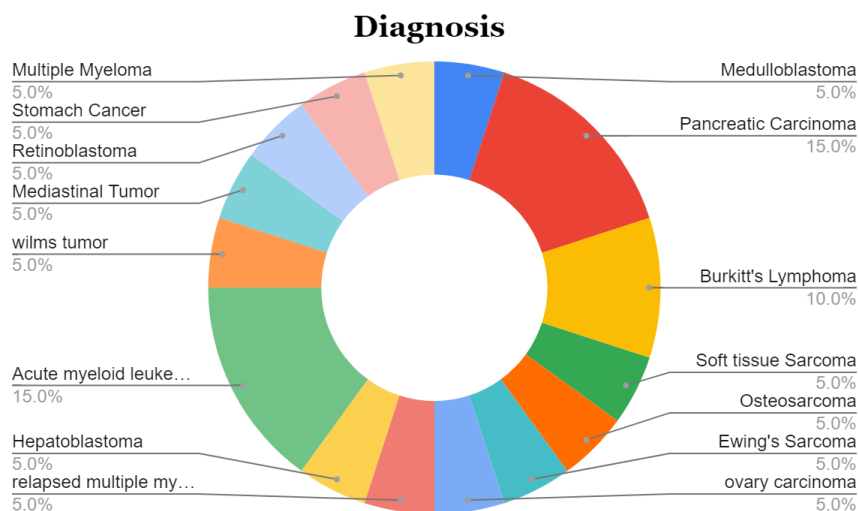


Fig. 2: Observed individual diagnosis

Table 3a: Chemotherapy prescribed drugs in various kind of unique carcinomas

Name of the drugs	Frequency	Percent
Carboplatin	2	6.1
Cisplatin	2	6.1
cytarabine	2	6.1
Decitabine	1	3.0
Dexamethasone	1	3.0
Doxorubicin	1	3.0
Etoposide	1	3.0
Folfinox	1	3.0
ifosfamide	2	3.0
Methotrexate	1	3.0
octreotide acetate	1	3.0
Rituximab	1	3.0
vincristine	4	12.1
Zoledronic acid	2	6.1

Table 3b: Antibiotic utilization in chemotherapy

Name of the drugs	Frequency	Percent
Actinomycin	1	3.0
Acyclovir	4	12.1
Amikacin	1	3.0
Fluconazole	1	3.0
Meropenem	2	6.1
Metronidazole	1	3.0
Piperacillin+Tazobactam	1	3.0
polymyxin E	1	3.0
Sulfamethoxazole+Trimethoprim	2	6.1
Tigecycline	1	3.0
Vancomycin	1	3.0
Voriconazole	2	6.1

As per the chi square value this study is extremely significant (P<0.001)

DISCUSSION

This study result shows that antibiotic utilization during ongoing cytotoxic treatment of rare metastasis. The antibiotics prescribed in the only particular specific conditions like pancreatic carcinoma, Burkitt's lymphoma, Ewing's sarcoma, Wilms tumour, Hepatoblastoma, Acute myeloid leukaemia. However, in pancreatic carcinoma, antibiotics are decreasing tumour proliferation by 50% studied in animal models [14]. Burkitt's lymphoma occurs in three conditions like Epstein bar virus, sporadic and immunodeficiency associated diseases such as HIV condition, the use of antivirals in this condition EBV and HIV decrease the risk of secondary infection condition [15, 16]. In Ewings sarcoma, it often occurs in around the

bones they prescribed RNA synthesis inhibitors [17]. Wilms tumour antibiotic usage is very less than comparing other types of carcinomas because of the immature form of cells developed when the baby was born [18]. Likewise, every metastasis having hidden challenges is furthermore investigation needs in clinical trials.

CONCLUSION

Cancer is a complex disorder, which is occurred through gene proliferation and socio-environmental factors. Rare metastasis is challenging to physicians and patients, however, cytotoxic therapy with antibiotics can reduce the risk of rare metastasis and as well improved therapeutic adhesion, and we need clear supporting evidence on it through clinical trials.

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AUTHORS CONTRIBUTIONS

All the authors have contributed equally.

CONFLICT OF INTERESTS

Declare none

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