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Panacea Journal of Medical Sciences

Journal homepage: http://www.pjms.in/

Original Research Article

Prevalence of thrombocytopenia among Indian patients who are on chemotherapeutic drugs in five cities of India: A cross sectional descriptive study

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ARTICLE INFO

Article history:
Received 10-09-2022
Accepted 20-11-2022
Available online 07-12-2023

Keywords:
Chemo drug induced thrombocytopenia
Chemotherapy drugs and thrombocytopenia

ABSTRACT

Background: Chemotherapeutic drugs are chemical drugs used in management of cancer, these drugs are chemotoxic and has varied number of adverse effects. Thrombocytopenia is one such adverse effect, thrombocytopenia is the condition in which the platelets counts are less than few lakhs and cause the symptoms of the bleeding. The present study desiged to find the prevalence of thrombocytopenia among Indians who are on chemotherapeutic drugs.

Materials and Methods: a descriptive cross section survey design used to identify the prevalence rate of thrombocytopenia among patients who are on chemotherapeutic drugs in India the cities studied are Lakhimpur 268 patients, Panipat 357 patients, Sonipat 384 patients, Gohana 291 patients, Delhi 445 patients, a total 1745 patients were under chemotherapeutic drugs of which 281 patients developed thrombocytopenia, in the samples collected analyzed at various selected diagnostic centers.

Results: The present study found that in Lakhimpur for 268 patients on chemotherapy 37 patients samples developed thrombocytopenia, Panipat for 357 patients on chemotherapy 76 patients samples developed thrombocytopenia, Sonipat for 384 patients on chemotherapy 68 patients samples developed thrombocytopenia, Gohana for 291 patients on chemotherapy 32 patients samples developed thrombocytopenia and in Delhi for 445 patients on chemotherapy 68 patients samples developed thrombocytopenia respectively. The overall prevalence of thrombocytopenia among patients who are on chemotherapeutic drugs is 16.01%.

Conclusion: chemo drugs are vital in management of cancer conditions, these drugs are best currently known in reducing or killing the cancer cells, however they also carry a bag of adverse effects which hampers the wellbeing of patients hence, the knowledge and prevalence rate of thrombocytopenia in patients under chemotherapy plays a vital role in primordial prevention and better management of thrombocytopenia in its occurrence.

1. Introduction

A common hematologic side effect of myelosuppressive and ablative therapy is chemotherapy-induced thrombocytopenia (CIT). In addition to the possibility

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https://doi.org/10.18231/j.pjms.2023.135

of a potentially fatal spontaneous bleeding, severe or persistent CIT may also call for a reduction and/or postponement of treatment dosages. [1–5]

Thrombocytopenia, an abnormally low blood platelet count, is a common side effect of myelosuppressive chemotherapy. [5–7] Prior studies estimated that approximately 10% to 38% of patients with a solid tumor and 40% to 68% of patients with a hematologic malignancy experience thrombocytopenia. [8–10] The incidence and prevalence of chemotherapy induced thrombocytopenia vary greatly by type of cancer and chemotherapy regimen, for example, from 16% in head and neck cancer to 68% in hematologic cancers, and from 8% in taxane based regimens to 37% in gemcitabine based regimens and 82% in carboplatin monotherapy. [11] Gemcitabine based and platinum based regimens have consistently been associated with the highest risk of thrombocytopenia. [12–14] In solid tumor patients, the highest prevalence of thrombocytopenia was observed in patients with colorectal cancer, followed by non-small cell lung cancer, and ovarian cancer. [15–17] Currently, there are no standardized guidelines for the prevention or treatment of chemotherapy induced thrombocytopenia. To reduce the risk of bleeding or need for transfusions among patients with severe chemotherapy induced thrombocytopenia, chemotherapy dose is typically modified, which may decrease relative dose intensity and reduce treatment efficacy. Hence the present study aims to assess the prevalence of thrombocytopenia among patients who are on chemotherapeutic drugs. By understanding the incidence, the relative risk and complications can be managed or prevented.

2. Objectives

The present study aimed to assess the prevalence of prevalence of thrombocytopenia among Indians who are on chemotherapeutic drugs.

3. Materials and Methods

A survey study designed to assess the prevalence of thrombocytopenia among Indians who are on chemotherapeutic drugs in multiple cities at north India the cities are Lakhimpur, Panipat, Sonipat, Gohana, and Delhi for a period of 11 months from January 2022 to November 2022. A total of 1745 patients samples from 5 cities were selected from different diagnostic centers, of these at Lakhimpur 37 samples, Panipat 76 samples, Sonipat 68 samples, Gohana 32 samples, Delhi 68 samples respectively were found having decreased thrombocytes.

4. Results

The present study designed to assess the prevalence of thrombocytopenia among Indians who are on chemotherapeutic drugs. The following are the findings of the study.

Table 1: List of chemo drugs used that caused thrombocytopenia and number of patients used the respective chemodrugs

S.No.	Chemodrugs caused thrombocytopenia	Number of patients given these drugs
1	Bendamustine	24
2	Chlorambucil	19
3	Cisplatin	28
4	Cyclophosphamide	26
5	Carboplatin	18
6	Altretamine	28
7	Busulfan	25
8	Carmustine	27
9	Cytarabine	20
10	Gemcitabine	22
11	Methotrexate	16
12	Fludarabine	28
	Total	281

Table 2, describes the distribution ofprevalence of thrombocytopenia among patients who were on chemotherapeutic drug at various cities under study in North India, the cities are Lakhimpur total 268 samples were collected of them 37 samples, in Panipat total 357 samples were collected 76 samples, in Sonipat total 384 samples were collected of them 68 samples, in Gohana total 291 samples were collected of them 32 samples and in Delhi total 445 samples were collected of them 68 samples had decreased platelet counts respectively.

The study also found that prevalence of thrombocytopenia among patients who were on chemotherapeutic drug at various cities for total sample of 1745, at Lakhimpur 13.80%, Panipat 21.28%, Sonipat 17.70%, Gohana 10.99%, Delhi 15.28% respectively and total prevalence of thrombocytopenia among patients who were on chemotherapeutic drug at various cities under study in North India is 16.01% is represented in pie diagram.

From Table 3, the study found that out of 281 total thrombocytopenia samples who were on chemotherapeutic drug 177 (62.98%) were males and 104 (37.01%) were females. Among which in Lakhimpur out of 37 samples 20 (54.05%) were males and 17 (45.94%) were females, at Panipat in 76 samples 50 (65.78%) were males and 26 (34.21%) were females, at Sonipat 68 samples collected of which 43 (63.23%) were males and 25 (36.76%) were females, at Gohana total 32 samples of them 20 (62.50%) were males and 12 (37.50%) were females and at Delhi 68 samples of them 44 (64.70%) were males and 24 (35.29%) were females respectively, signifies that the prevalence of thrombocytopenia who were chemotherapy high in male than in females.

Table 4, describes the distribution of the samples as per their age in years, in Lakhimpur out of 37 thrombocytopenia samples who were on chemotherapy 20 to 40 years aged

Table 2: Describes the distribution of the prevalence of thrombocytopenia among patients who were on chemotherapeutic drug at various cities under study.

S.No.	City	Number of patients samples	Number of chemodrug caused thrombocytopenic patients	Percentage
1	Lakhimpur	268	37	13.80
2	Panipat	357	76	21.28
3	Sonipat	384	68	17.70
4	Gohana	291	32	10.99
5	Delhi	445	68	15.28
Total		1745	281	16.01

Table 3: Describes the distribution of gender of the samples having thrombocytopenia who were on chemotherapeutic drug

S.No.	City	Number of drug induced thrombocytopenia	Male	Percentage	Female	Percentage
1	Lakhimpur	37	20	54.05	17	45.94
2	Panipat	76	50	65.78	26	34.21
3	Sonipat	68	43	63.23	25	36.76
4	Gohana	32	20	62.50	12	37.50
5	Delhi	68	44	64.70	24	35.29
Total		281	177	62.98	104	37.01

Table 4: Describes the distribution of the samples according to their age in years.

S.No.	City	Number of drug induced thrombocytopenia	Age in years	Number of samples	Percentage
			20 to 40	15	40.54
1	Lakhimpur	37	41 to 60	15	40.54
			More than 61	7	18.91
			20 to 40	23	30.26
2	Panipat	76	41 to 60	34	44.73
			More than 61	19	25.00
			20 to 40	28	41.17
3	Sonipat	68	41 to 60	30	44.11
			More than 61	10	14.70
			20 to 40	12	37.50
4	Gohana	32	41 to 60	15	46.87
			More than 61	5	15.62
			20 to 40	20	29.41
5	Delhi	68	41 to 60	38	55.88
			More than 61	10	14.70
Total		281		281	

samples were 15 (40.54%), 41 to 60 years aged were 15 (40.54%) and more than 61 years were 7 (18.91%), in Panipat out of 76 thrombocytopenia samples who were on chemotherapy 20 to 40 years aged samples were 23 (30.26%), 41 to 60 years aged were 34 (44.73%) and more than 61 years were 19 (25.00%), in Sonipat out of 68 thrombocytopenia samples who were on chemotherapy 20 to 40 years aged samples were 28 (41.17%), 41 to 60 years aged were 30 (44.11%) and more than 61 years were 10 (14.70%), in Gohana out of 32 thrombocytopenia samples who were on chemotherapy 20 to 40 years aged samples were 12 (37.50%), 41 to 60 years aged were 15 (46.87%) and more than 61 years were 5 (15.62%), in Delhi out of 68 thrombocytopenia samples who were on chemotherapy 20 to 40 years aged samples were 20 (29.41%), 41 to 60 years aged were 38 (55.88%) and more than 61 years were 10 (14.70%) signifies that the thrombocytopenia samples who were on chemotherapy can cause to any age group.

5. Discussion

The present study aimed to study the prevalence of the thrombocytopenia among Indian patients who were on chemotherapy drugs in selected various cities at North India. The study was conducted at 5 cities are Lakhimpur, Panipat,

Sonipat, Gohana and Delhi for a period of 6 month from December 2021 to June 2022 collected 1745 samples of which 281 samples were showed thrombocytopenia who were on chemotherapy drugs.

The present study designed to assess the prevalence of the thrombocytopenia patients who were on chemotherapy drug found that the prevalence is 16.01% in selected cities, these findings were similar to the study 4% of patients with solid tumors and 16% with hematologic malignancies experienced grade 3 thrombocytopenia.[18,19]

the study witnessed that out of 281 samples 177 (62.98%) were males and 104 (37.01%) were females these finding were similar to study[19] and the study also found that the age of drug induced thrombocytopenia is similar in all age groups these findings were similar to the study.[20] However the age group between 41 to 60 years were at high prevalence of developing thrombocytopenia due to chemodrugs.

6. Conclusion

Chemothreapeutic drugs administered for therapeutic purpose causes thrombocytopenia as its adverse effects, the knowledge of prevalence of disorder prevent the incidence of the disorder and the minimal use of cytotoxic drugs, the present study found that prevalence of thrombocytopenia samples who were on chemotherapy was 16.01% which is evident by other studies. This prevalence of thrombocytopenia samples that were on chemotherapy in selected cities of North India gives a relevant information to control and prevent the disorder and manage patients as needed.

7. Source of Funding

None.

8. Conflict of Interest

None.

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Cite this article: Malik P, Verma MK, Khattri J, Veeresh VG, Khajuria A, Singh L. Prevalence of thrombocytopenia among Indian patients who are on chemotherapeutic drugs in five cities of India: A cross sectional descriptive study. *Panacea J Med Sci* 2023;13(3):736-740.