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Research Article

The effect of Cisplatin on Complete blood count among chemotherapy Sudanese patients at Taiba Cancers Center in Khartoum state 2021

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Abstract

Background: Cisplatin is one of therapy used as anticancer activity in a variety of tumors. Among many chemotherapy drugs that are widely used for cancer, Cisplatin is one of the most compelling ones.

Material and methods: This study was Analytical cross sectional study conducted at Taiba Cancer Center, Khartoum, Sudan, during the period July 2021 to November 2021 and aimed to estimate the complete blood count among chemotherapy Sudanese patients treated with Cisplatin. 50 cancer patients treated with cisplatin as chemotherapy selected as a case group and 50 apparently health donor were selected as control group. Three ml of the venous blood was collected in EDTA container. Six samples collected from each patient before each dose of cisplatin. Complete blood count was done by using Sysmex Automated Hematology Analyzer KX 21N.

Result: When compared the base line of case value of RBCs, Hb, WBCs, neutrophils, and platelets with control there were insignificant differences (P. value ≥ 0.05). But when compared RBCs, Hb, WBCs, neutrophils, and platelets between the case (baseline) and the cases in cycle 1, 2,3,4 and 5 there was significant decreased among progression of doses (P. value ≤ 0.05). There was insignificant correlation in the duration of the cancer and WBCs, neutrophil count, HGB and platelets count (P. value ≥ 0.05), significant correlation with RBCs in baseline and cycle 2 (P. value < 0.05). When correlate the anatomical location of cancer with WBCs, neutrophil count there was insignificant correlation and significant correlation with RBC and HGB in cycle 5 and platelets count cycle 2 and cycle 3

Conclusion: The study observed that Cisplatin drug can affect on the hematological parameters and induced anemia, neutropenia and thrombocytopenia.

Keywords: Cisplatin, chemotherapy, cancer, neutropenia and thrombocytopenia.

INTRODUCTION

Cancer is a disease which includes abnormal cell growth with ability to invade and diffuse to other parts of the body with multiple possible causes such as genetic, environmental, or constitutional characteristics of the individual. [1] Also it is the 21st century most critical and intensive disease globally and it is the second leading cause of death in the world [2]

Cancers arise from any organ or body structure and are composed of tiny cells that have lost the ability to stop growing. Occasionally, cancer may be detected "incidentally" by a laboratory test or radiological routine test or for an entirely different reason. In general, cancer must reach a size of 1 cm, or be comprised of 1 million cells, before it is detected. At this point, it may be referred to as a "'mass," a "growth," a "tumor," a "nodule," a "lump," or a "lesion." Exceptions to this general rule include cancers of the blood and bone marrow (leukemia's and lymphomas) – which frequently do not produce a "mass," but will be evident on laboratory tests.[3]

The cancer treatment that a patient receives is set by the phase of cancer at diagnosis, the type, location of cancer, and the standard medical practices and treatment guidelines in the patient's country. Several options are available for cancer treatment such as surgery, chemotherapy, and radiation therapy. However, these treatments are not usually curative and put the patients at the risk of several side effects. Consequently, several side diverse take place with any cancer drug treatment like anemia, infection, bleeding problem, nausea, and vomiting, allergic reactions, pain or tenderness, constipation or diarrhea, hair loss, sore mouth, increased energy, and difficulty of sleeping. If this situation is not monitored properly, this may lead to treatment failure [4,5].

Cisplatin was first synthesized by M. Peyrone in 1844 and its chemical structure was first elucidated by Alfred Werner in

1893. However, the compound did not gain scientific investigations until the 1960's when the initial observations of Rosenberg at Michigan State University pointed out that certain electrolysis products of platinum mesh electrodes were capable of inhibiting cell division in *Escherichia coli* created much interest in the possible use of these products in cancer chemotherapy. Since the identification of cis-dichloro diammine platinum (II) (cisplatin, r) as the agent responsible for this activity, much interest has been generated in the use of coordination complexes of platinum, palladium, and other noble metals in the treatment of cancer. [6]

Cisplatin has been especially interesting since it has shown anticancer activity in a variety of tumors including cancers of the ovaries, testes, soft tissue, bones, muscles, blood vessels and solid tumors of the head and neck. Among many chemotherapy drugs that are widely used for cancer, Cisplatin is one of the most compelling ones. It was the first FDA-approved platinum compound for cancer treatment in 1978 this has led to interest in platinum (II) - and other metal-containing compounds as potential anticancer drugs. Combination therapy of cisplatin with other cancer drugs has been applied as novel therapeutic strategies for many human cancers. [7,8.]

Cisplatin may lower the number of white blood cells in the blood. This will make the patient more susceptible to infection. When the number of white blood cells is low, this is called neutropenia. The number of white blood cells normally increases gradually, returning to normal before your next chemotherapy session. The blood test will be done before the next chemotherapy. If the patient white blood cells are still low, the doctor may postpone the treatment for a short period of time. [9] In Sudan it has been used for treatment of numerous human cancers including bladder, head and neck, lung, ovarian, and testicular cancers. It is effective against various types of cancers, including carcinomas, germ cell tumors, lymphomas, and sarcomas. There are no studies conducted on effect of cisplatin on CBC among cancer Sudanese patients, this study will be designed to evaluate the effect of Cisplatin on CBC count among chemotherapy patient.

MATERIAL AND METHODS:

This study was Analytical cross sectional study conducted at Taiba Cancer Center, Khartoum, Sudan, during the period July 2021 to November 2021 and aimed to estimate the complete blood count among chemotherapy Sudanese patients treated with Cisplatin. 50 cancer patients treated with cisplatin as chemotherapy selected as a case group and 50 apparently health donor were selected as control group. Three ml of the venous blood was collected in EDTA container. Six samples collected from each patient before each dose of cisplatin. Complete blood count was done by using Sysmex Automated Hematology Analyzer KX 21N.A structured questionnaire was designed to collect personal and medical information about the study group, including age, sex, present of chronic disease, duration of cancer and duration of the using Cisplatin. The laboratory data included hematological results (CBC). The data that was collected by questionnaire and laboratory results were analyzed by statistic package for social sciences SPSS version 20 computerized program. Data would express as mean with standard deviation. Means of quantitative variables would be compared by ANOVA. P. value of ≤ 0.05 considered statistic significant. The study was approved by Ethical Committee of the College Medical Laboratory Sciences, National University.

RESULTS

The epidemiological study

In the present study 50 of patient treated with Cisplatin were included. Among them, 42% were males, while 58% were females. In addition, 50 of apparently healthy individuals were selected as control group, 54% were males, while 46 % were female (Table 1). The frequency of cases age group; above 50 years about 70%, and 41-50 years about 16%. For the control 20-30 years about 58% and above 50 years about 20% (table 2)

In the cases group the frequency of cancer types according to the anatomical location was; the respiratory system cancer about 26%, GIT system cancer 26%, breast cancer about 14%, ENT cancer about 14% and urinary system cancer are 8% (table 3, 4). Also most of them had no history of chronic diseases; only about 4% had hypertension (table 5)

Table (1): Frequency of gender among the study group

Gender		Frequency	Percent
Case	Male	21	42
	Female	29	58
	Total	50	100
Control	Male	27	54.0
	Female	23	46.0
	Total	50	100.0

Table (2): Frequency of age group in case and control

Age		Frequency	Percent
Case	20-30	3	6.0
	31-40	4	8.0
	41-50	8	16.0
	Above 50	35	70.0
	Total	50	100.0
Control	20-30	29	58.0
	31-40	8	16.0
	41-50	3	6.0
	Above 50	10	20.0
	Total	50	100.0

Table (3): Frequency of anatomical location of cancer

Type of cancer	Frequency	Percent
Respiratory system	13	26.0
ENT	7	14.0
Breast cancer	7	14.0
GI system	13	26.0
Urinary system	4	8.0
Genital tract	4	8.0
Bone	2	4.0
Total	50	100.0

Table (4) frequency of cancer types among case group

Types of cancer	Frequency	Percent
Lung	7	14
Gall bladder	1	2
Cervix	1	2
Osteosarcoma	2	4
Hypo pharyngeal	2	4
Endometrium	1	2
Liver	2	4
Pancreas	3	6
Tongue	1	2
Ovarian	2	4
Nasopharyngeal cancer	4	8
Tonsil	1	2
Sub mandibular gland cancer	2	4
Stomach	1	2
Bladder	3	6
Breast	7	14
Esophageal cancer	4	8
Gastric	2	4
Urethral cancer	1	2
Maxilla	3	6
Total	50	100

Table (5) frequency of chronic disease among case group

Chronic diseases	Frequency	Percent
HTN	2	4
No	48	96
Total	50	100

White blood cell results

When compared the WBCs between case (baseline) and control groups; there was in significant differences in WBCs (mean 7.2± 3.5, 7.5 ± 1.8respectively) (p.value 0. 922). But when compared WBCs between the case (baseline) and the cases in cycle 1, 2,3,4 and 5 there was significant decrease in WBCs (p.value ≤0.05) and clearly significant decrease in neutrophil count (p.value ≤0.05) (table6,7) (fig 1,2)

*cycle 1; after the first dose of cisplatin, cycle 2 after the second dose of cisplatin, cycle 3 after the third dose of cisplatin, cycle 4 after the fourth dose of cisplatin, cycle 5 after the fifth dose of cisplatin.

Table (6) Comparison of White Blood Cells count between case and control, case (baseline) and the cases in cycle 1, 2,3,4 and 5

Parameters (I)	Parameters (II)	Mean of Parameters (I)	Mean of Parameters (II)	P. value
WBCs baseline	WBCs control	7.2 ± 3.5	7.5 ± 1.8	0.922
	WBCs cycle 1		6.3 ± 2.9	0.004
	WBCs cycle 2		6.3 ± 2.9	0.006
	WBCs cycle 3		5.5 ± 2.7	0.009
	WBCs cycle 4		4.9 ± 2.5	0.000
	WBCs cycle 5		4.4 ± 2.2	0.000

Table (7) Comparison of neutrophil count between case and control, case (baseline) and the cases in cycle 1, 2,3,4 and5

Parameters (I)	Parameters (II)	Mean of Parameters (I)	Mean of Parameters (II)	P. value
Neutrophil baseline	Neutrophil control	4.4 ± 2.5	4.9 ± 1.3	0.874
	Neutrophil cycle 1		3.6 ± 2.1	0.004
	Neutrophil cycle 2		3.5 ± 2.3	0.000
	Neutrophil cycle 3		2.8 ± 1.5	0.000
	Neutrophil cycle 4		2.9 ± 2.0	0.000
	Neutrophil cycle 5		2.2 ± 1.3	0.000

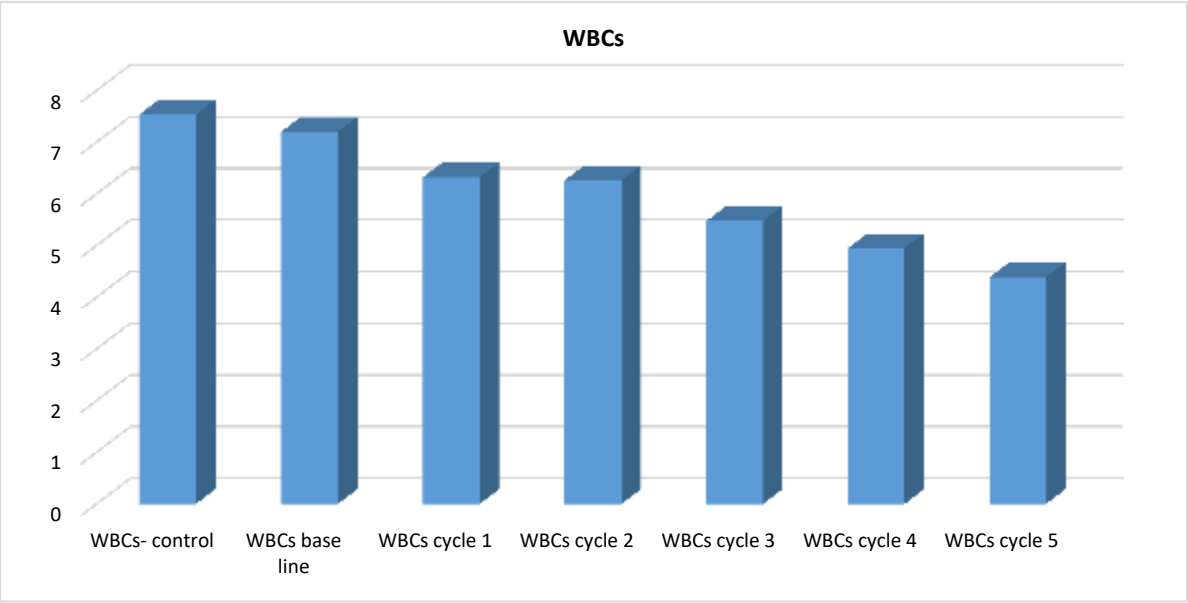

Figure (1): mean of WBCs in the case and control

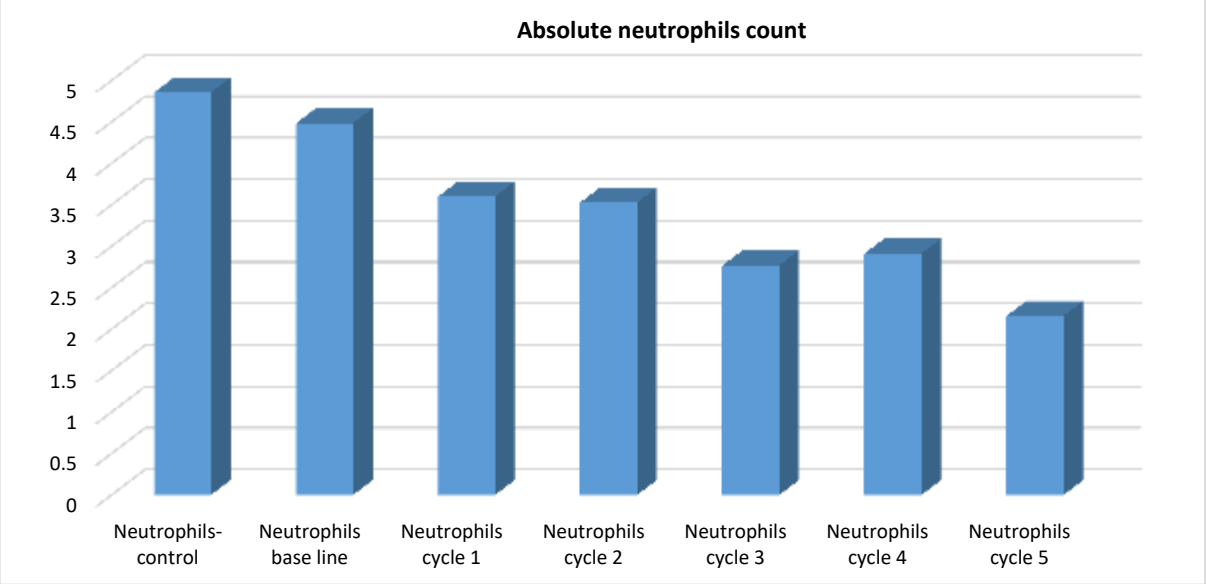

Figure (2): mean of absolute neutrophil count in the case and control

Red blood cell and HGB

The result revealed in significant differences in RBCs and HGB When compared between case (baseline) and control with p.value 0.939 and 0.294 respectively. while when compared RBCs and HGB between the case (baseline) and the cases in cycle 1, 2,3,4 and 5 there was significant decrease in RBCs and HGB (p.value 0.000) (table 8,9) (fig 3,4)

Table (8) Comparison of RBCs between case and control, case (baseline) and the cases in cycle 1, 2,3,4 and 5

Parameters (I)	Parameters (II)	Mean of Parameters (I)	Mean of Parameters (II)	P. value
RBCs baseline	RBCs control	4.3 ± 0.7	4.8 ± 0.5	0.939
	RBCs cycle 1		4.1 ± 0.7	0.000
	RBCs cycle 2		4.0 ± 0.6	0.000
	RBCs cycle 3		3.9 ± 0.6	0.000
	RBCs cycle 4		3.7 ± 0.6	0.000
	RBCs cycle 5		3.4 ± 0.6	0.000

Table (9) Comparison of HGB between case and control, case (baseline) and the cases in cycle 1, 2,3,4 and5

Parameters (I)	Parameters (II)	Mean of Parameters (I)	Mean of Parameters (II)	P. value
Hb baseline	Hb control	11.9 ± 1.9	13.2 ± 1.4	0.294
	Hb cycle 1		11.2 ± 1.5	0.000
	Hb cycle 2		10.9 ± 1.6	0.000
	Hb cycle 3		10.8 ± 1.4	0.000
	Hb cycle 4		10.3 ± 1.3	0.000
	Hb cycle 5		9.7 ± 1.2	0.000

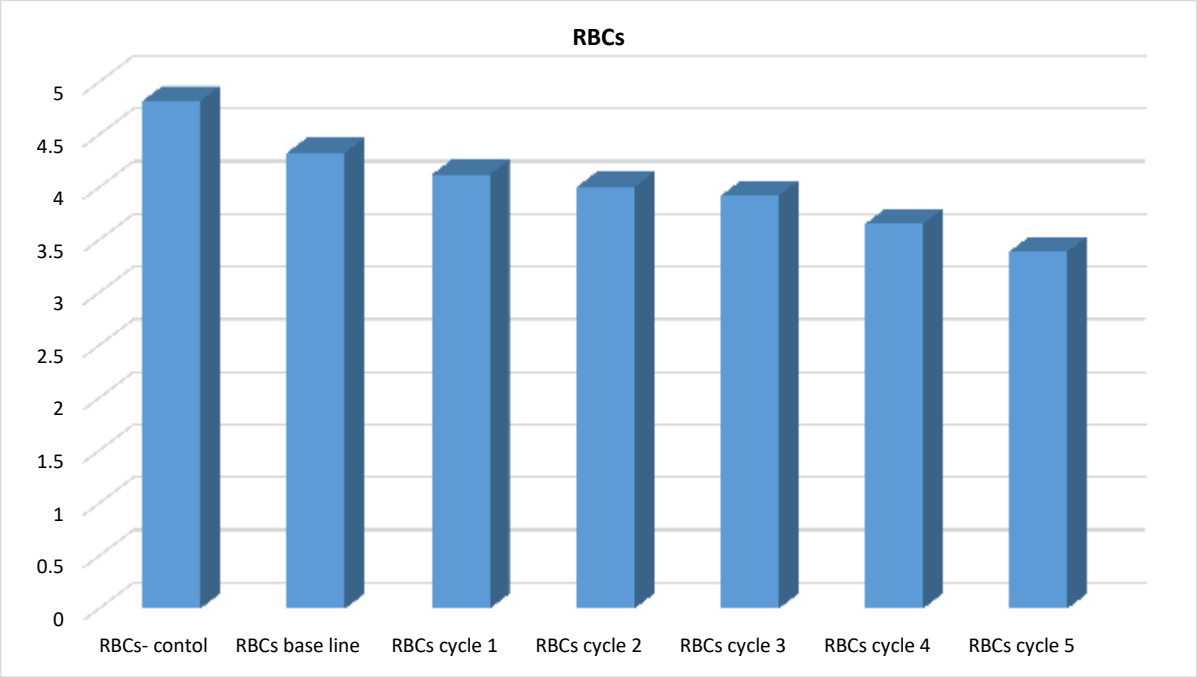

Figure (3): mean of RBCs count in the case and control

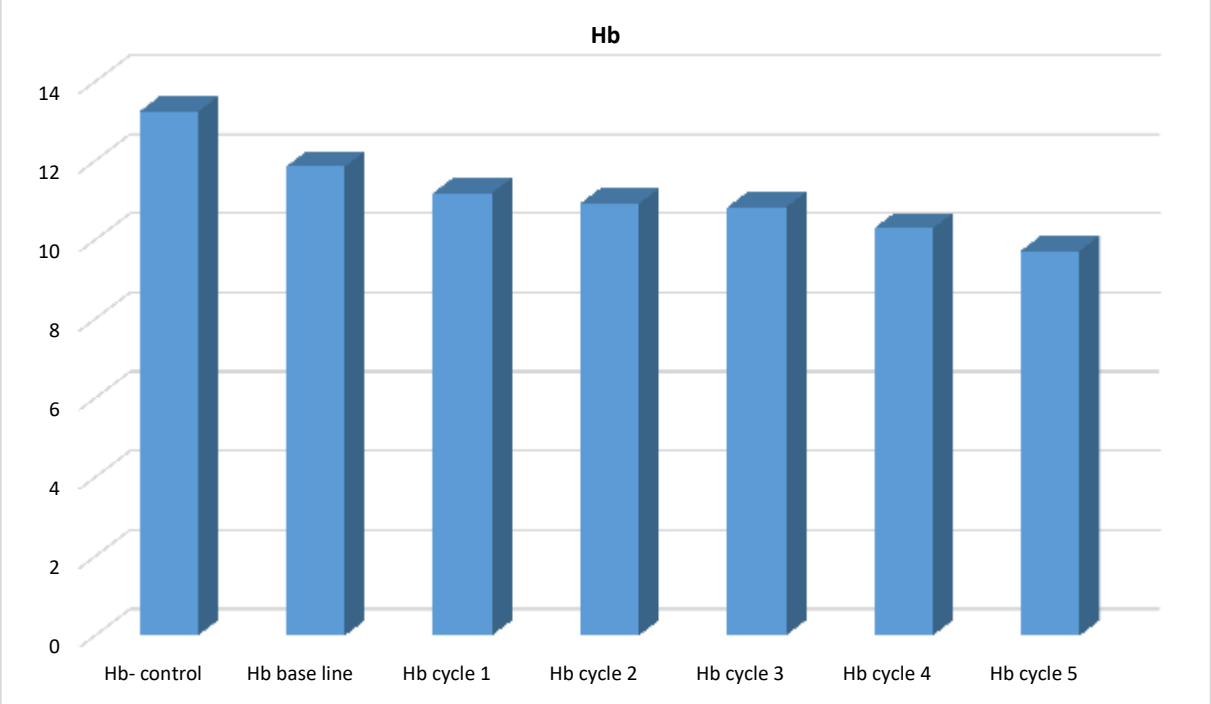

Figure (4): mean of HGB in the case and control

Platelets

The result showed in significant differences in platelets count when compared between case (baseline) and control with p.value 0.669. when compared platelets count between the case (baseline) and the cases in cycle 1, 2,3,4 and 5 there was significant decrease in the platelets count (p.value 0.000) (table 10) (fig 5)

Finally, there was in significant correlation in the duration of the cancer and WBCs, neutrophil count, HGB and platelets count (p.value ≥ 0.05), significant correlation with RBCs in baseline and cycle 2 (p.value < 0.05) (tables 11, 12, 13, 14, 15)(fig 6,7). When correlate the anatomical location of cancer with WBCs, neutrophil count there was in significant correlation(p. value>0.05), and significant correlation with RBC and HGB in cycle 5and platelets count cycle 2 and cycle 3 (p.value<0.05)(tables 16,17,18,19,20).

Table (10) Comparison of platelets count between case and control, case (baseline) and the cases in cycle 1, 2,3,4 and5

Parameters (I)	Parameters (II)	Mean of Parameters (I)	Mean of Parameters (II)	P. value
PLTs baseline	PLTs control	317.4 ± 121.1	276.1 ± 59.5	0.669
	PLTs cycle 1		370.8 ± 171.7	0.000
	PLTs cycle 2		322.8 ± 157.9	0.000
	PLTs cycle 3		325.2 ± 162.1	0.000
	PLTs cycle 4		260.6 ± 123.1	0.000
	PLTs cycle 5		233.1 ± 137.9	0.000

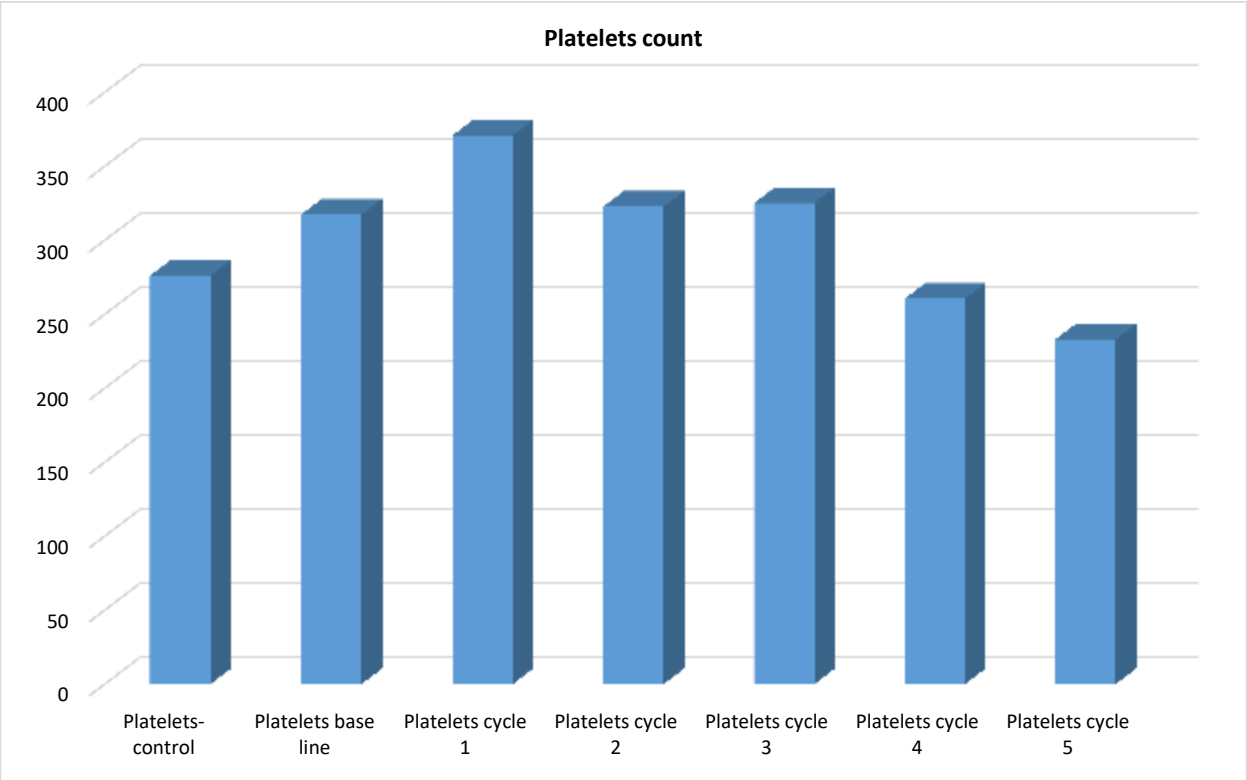

Figure (5): mean of platelets count in the case and control

Table (11) Correlation between White Blood Cells count and duration of cancer

		WBCs base line	WBCs cycle 1	WBCs cycle 2	WBCs cycle 3	WBCs cycle 4	WBCs cycle 5
Duration of cancer	Pearson Correlation	.037	-.137	-.254	-.220	-.206	-.109
	P. value	.800	.343	.075	.125	.152	.450
	N	50	50	50	50	50	50

Table (12) Correlation between neutrophil count and duration of cancer

		Neutrophil base line	Neutrophil cycle 1	Neutrophil cycle 2	Neutrophil cycle 3	Neutrophil cycle 4	Neutrophil cycle 5
Duration of cancer	Pearson Correlation	.066	-.044	-.197	-.203	-.181	-.088
	P. value	.648	.760	.170	.157	.208	.543
	N	50	50	50	50	50	50

Table (13) Correlation between the RBCs and duration of cancer

		RBCs base line	RBCs cycle 1	RBCs cycle 2	RBCs cycle 3	RBCs cycle 4	RBCs cycle 5
Duration of cancer	Pearson Correlation	-.321*	-.269	-.330*	-.245	-.217	-.190
	P. value	.023	.059	.019	.087	.129	.187
	N	50	50	50	50	50	50

Table (14) Correlation between the HGB and duration of cancer

		Hb base line	Hb cycle 1	Hb cycle 2	Hb cycle 3	Hb cycle 4	Hb cycle 5
Duration of cancer	Pearson Correlation	-.113	-.149	-.200	-.194	-.047	.030
	P. value	.433	.301	.163	.177	.746	.838
	N	50	50	50	50	50	50

Table (15) Correlation between the platelets count and duration of cancer

		Platelet base line	Platelet cycle 1	Platelet cycle 2	Platelet cycle 3	Platelet cycle 4	Platelet cycle 5
Duration of cancer	Pearson Correlation	.131	-.193	-.051	-.033	-.069	-.048
	P. value	.365	.180	.723	.822	.632	.742
	N	50	50	50	50	50	50

Table (16) Comparison of WBCs case (baseline) and the cases in cycle 1, 2,3,4 and5 according to anatomical location of cancer

Parameters	Respiratory	ENT	Breast	GI	Urinary	Genital	Bone	P. value
WBCs base line	8.1 ± 4.2	5.6 ± 1.5	6.7 ± 2.4	8.1 ± 3.9	4.6 ± 0.3	6.5 ± 2.2	9.2 ± 7.1	0.370
WBCs cycle 1	7.2 ± 2.9	7.4 ± 3.5	5.9 ± 4.1	5.8 ± 1.9	4.6 ± 1.4	4.7 ± 1.2	8.6 ± 3.4	0.360
WBCs cycle 2	6.9 ± 3.3	7.4 ± 3.5	5.8 ± 1.6	5.7 ± 2.1	3.9 ± 0.7	5.1 ± 1.4	9.9 ± 7.9	0.182
WBCs cycle 3	6.2 ± 3.0	5.7 ± 2.3	5.3 ± 2.7	4.8 ± 1.7	4.2 ± 1.0	4.6 ± 0.7	9.5 ± 8.3	0.271
WBCs cycle 4	5.3 ± 2.5	4.8 ± 1.9	3.8 ± 0.5	4.9 ± 2.3	4.5 ± 0.5	4.4 ± 1.4	9.7 ± 9.2	0.168
WBCs cycle 5	4.9 ± 2.9	4.5 ± 1.6	4.0 ± 0.7	3.6 ± 1.0	4.3 ± 0.4	3.9 ± 0.5	8.5 ± 7.8	0.147

Table (17) Comparison ofneutrophilscase (baseline) and the cases in cycle 1, 2,3,4 and5 according to anatomical location of cancer

Parameters	Respiratory	ENT	Breast	GI	Urinary	Genital	Bone	P. value
Neutrophils base line	5.1 ± 3.4	3.5 ± 1.0	4.3 ± 2.2	5.0 ± 2.7	2.8 ± 0.4	4.3 ± 1.8	5.1 ± 4.3	0.658
Neutrophils cycle 1	4.4 ± 2.2	4.3 ± 2.7	2.3 ± 0.8	3.3 ± 1.7	2.5 ± 1.1	2.8 ± 0.8	6.3 ± 3.7	0.071
Neutrophils cycle 2	4.3 ± 2.5	4.4 ± 2.9	3.1 ± 1.9	2.9 ± 1.1	1.9 ± 0.4	2.5 ± 0.8	6.3 ± 6.6	0.180
Neutrophils cycle 3	2.9 ± 1.8	2.7 ± 1.3	3.2 ± 2.1	2.5 ± 1.2	2.3 ± 1.2	2.4 ± 0.9	3.7 ± 3.2	0.900
Neutrophils cycle 4	2.8 ± 1.9	3.8 ± 1.6	1.8 ± 0.3	2.9 ± 1.9	2.4 ± 1.2	2.3 ± 1.0	6.3 ± 7.0	0.124
Neutrophils cycle 5	2.3 ± 1.4	2.4 ± 1.1	1.8 ± 0.8	1.9 ± 0.5	2.2 ± 1.1	1.9 ± 0.7	4.4 ± 4.7	0.236

Table (18) Comparison of RBCs case (baseline) and the cases in cycle 1, 2,3,4 and5 according to anatomical location of cancer

Parameters	Respiratory	ENT	Breast	GI	Urinary	Genital	Bone	P. value
RBCs base line	4.5 ± 0.7	4.6 ± 0.5	4.1 ± 0.3	4.2 ± 0.9	4.8 ± 0.4	4.1 ± 0.5	3.4 ± 0.8	0.160
RBCs cycle 1	4.2 ± 0.6	4.4 ± 0.4	3.9 ± 0.6	4.0 ± 0.8	4.4 ± 0.5	3.6 ± 0.8	4.5 ± 0.3	0.399
RBCs cycle 2	4.0 ± 0.6	4.2 ± 0.6	3.5 ± 0.3	3.9 ± 0.6	4.3 ± 0.5	4.1 ± 0.1	4.2 ± 0.8	0.336
RBCs cycle 3	3.9 ± 0.8	3.9 ± 0.5	3.6 ± 0.5	3.9 ± 0.6	4.1 ± 0.4	3.9 ± 0.2	4.3 ± 0.9	0.793
RBCs cycle 4	3.6 ± 0.7	3.9 ± 0.6	3.3 ± 0.3	3.7 ± 0.6	4.1 ± 0.5	3.4 ± 0.7	3.6 ± 0.1	0.421
RBCs cycle 5	3.4 ± 0.7	3.7 ± 0.5	3.1 ± 0.4	3.4 ± 0.4	3.9 ± 0.3	3.1 ± 0.8	2.7 ± 0.6	0.048*

Table (19) Comparison of Hb case (baseline) and the cases in cycle 1, 2,3,4 and5 according to anatomical location of cancer

Parameters	Respiratory	ENT	Breast	GI	Urinary	Genital	Bone	P. value
Hb base line	12.5 ± 1.9	12.3 ± 1.6	11.0 ± 1.5	11.6 ± 2.3	13.3 ± 1.3	11.3 ± 0.9	8.5 ± 1.3	0.077
Hb cycle 1	11.5 ± 1.3	11.7 ± 1.2	10.9 ± 1.3	10.9 ± 1.8	11.9 ± 1.5	9.5 ± 1.7	11.7 ± 0.8	0.249
Hb cycle 2	10.8 ± 1.5	11.0 ± 2.0	9.7 ± 0.7	10.9 ± 1.7	12.3 ± 1.5	11.2 ± 0.4	11.4 ± 2.8	0.294
Hb cycle 3	11.0 ± 1.8	10.6 ± 1.6	10.3 ± 1.1	10.7 ± 1.1	12.1 ± 0.6	10.3 ± 0.7	11.8 ± 2.5	0.397
Hb cycle 4	10.1 ± 1.2	10.5 ± 2.2	9.5 ± 1.5	10.4 ± 0.9	11.7 ± 1.0	9.8 ± 0.7	10.8 ± 0.9	0.224
Hb cycle 5	9.7 ± 1.2	10.1 ± 1.6	9.4 ± 1.3	9.7 ± 0.9	11.3 ± 0.3	8.9 ± 0.5	8.2 ± 1.3	0.043*

Table (20) Comparison of platelets case (baseline) and the cases in cycle 1, 2,3,4 and5 according to anatomical location of cancer

Parameters	Respiratory	ENT	Breast	GI	Urinary	Genital	Bone	P. value
Platelets base line	323.1 ± 122.9	364.4±152.1	343.4 ± 97.6	270.1 ± 98.5	243.3 ± 27.7	325.0±175.2	465.5± 119.5	0.245
Platelets cycle 1	433.2 ± 194.2	368.4±124.4	378.7±154.4	309.1±154.5	314.5±155.3	281.8±148.2	638.0± 207.9	0.125
Platelets cycle 2	286.8 ± 136.9	420.1±251.5	407.0±133.2	258.3±107.5	255.3± 47.2	282.5±117.4	557.5 ± 53.0	0.033*
Platelets cycle 3	336.2 ± 146.2	347.6±221.2	358.6±147.6	298.9±126.7	201.8± 39.6	240.3±119.1	646.5± 221.3	0.047*
Platelets cycle 4	241.8 ± 95.6	334.7±229.2	266.6 ± 91.8	232.8± 88.9	262.5± 92.9	230.8±139.9	339.5± 133.6	0.621
Platelets cycle 5	216.0 ± 100.1	298.1±271.5	276.9±165.2	192.3± 87.4	234.0± 90.4	204.0± 86.4	285.0 ± 91.9	0.692

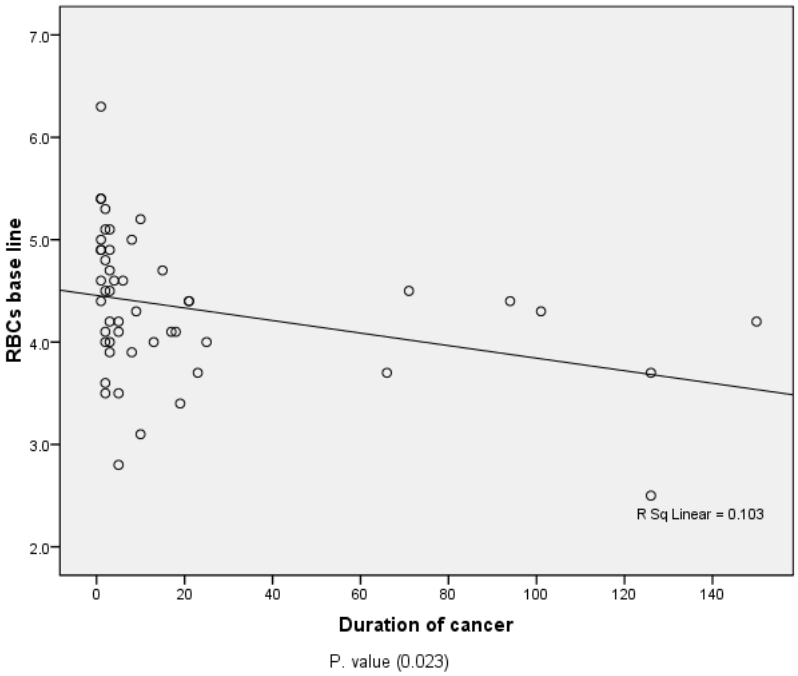

Figure (6) Correlation between duration of cancer and RBCs base line

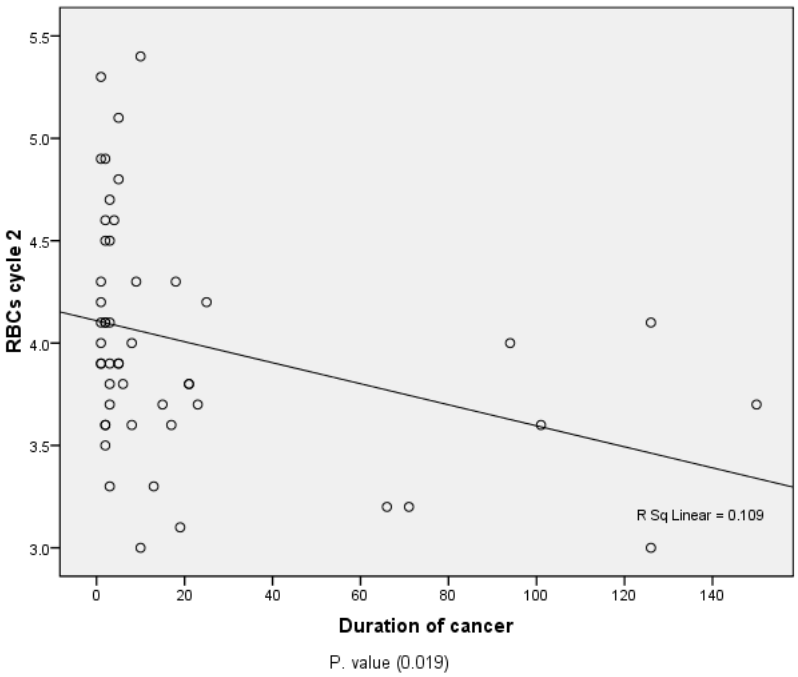

Figure (7) Correlation between duration of cancer and RBCs cycle 2

DISCUSSION

Cancer is a disease involving abnormal cell growth with the potential to invade and spread to other parts of the body with many possible causes such as genetic, environmental, or constitutional characteristics of the individual.[1]

Cancer patients who receive chemotherapy commonly suffer from hematological and biochemical profile alteration, as a result, it leads to the potentially life-threatening condition due to severe anemia and infections. [10]

A total of 50 samples were enrolled to evaluate the effect of Cisplatin drug in hematological parameters among chemotherapy patient whom treated with Cisplatin.

The result revealed in significant differences in RBCs and HGB When compared between case (baseline) and control with p.value 0.939 and 0.294 respectively. while when compared RBCs and HGB between the case (baseline) and the cases in cycle 1, 2,3,4 and 5 there was significant decrease in RBCs and HGB (p.value 0.000), this result was match with study conducted by Wondimneh et al which found significance decreases in the RBCs and Hb in the patients under cisplatin therapy. Also, Steele et al revealed significance decreases in the RBCs, Hb.[11,12,13,14]

Furthermore, Smita et al reported anemia in 60% of the cases when compared with that of the controls using Hemoglobin (Hb) and packed cell volume (PCV) [15]

In the present study when compared the WBCs between case (baseline) and control groups; there was in significant differences in WBCs (mean 7.2± 3.4, 7.5 ± 1.8 respectively) (p.value 0. 922). But when compared WBCs between the case (baseline) and the cases in cycle 1, 2,3,4 and 5 there was significant decrease in WBCs (p.value ≤0.05) and clearly significant decrease in neutrophil count (p.value ≤0.05), this result was similar with another study which reported; there was significance decreases in the WBCs and Neutrophil count among cancer patients under cisplatin therapy. [16] This result was differing with Smita et al finding which reported; the WBC counts, neutrophil % of cases were slightly higher than that of the controls because of the fact that all neoplasms of all types are associated with neutrophilia. [17]

The result showed in significant differences in platelets count when compared between case (baseline) and control with p.value 0.669. when compared platelets count between the case (baseline) and the cases in cycle 1, 2,3,4 and 5 there was significant decrease in the platelets count (p.value 0.000). Previous literature showed that high platelet counts are associated with later stage, higher risk of recurrence and metastasis in many types of malignancies. [18]

In the other hand one of the scientists said; the platelet counts of the cases (Cisplatin patients) was also higher than that of control. [(17)]The cause for this may be reactive thrombocytosis which is seen in malignancy patients as a result of cancer induced anemia. A negative feedback effect on erythropoietin production in patients of cancer breast as a result of anemia could be responsible for thrombocytosis. [19]

For the correlation between the parameters and other factors; there was in significant correlation in the duration of the cancer and WBCs, neutrophil count, HGB and platelets count (p.value ≥ 0.05), significant correlation with RBCs in baseline and cycle 2. When correlate the anatomical location of cancer with WBCs, neutrophil count there was in significant correlation, and significant correlation with RBC and HGB in cycle 5 and platelets count cycle 2 and cycle 3 (p.value ≥ 0.05).

Rabia Farooq also reported abnormal hematological parameters in gastric cancer patients. The cause of low hemoglobin (Hb) could be associated to anemia of chronic disorder. Anemia could be due to hemorrhage or due to with iron deficiency anemia when compared with the controls.[20] Also, Ufelle et al study found that platelet levels were higher in control group than the pre and post chemotherapy breast cancer patient. [21]

CONCLUSION:

In the conclusion the study observed that Cisplatin drug can affect on the hematological parameters and induced anemia, neutropenia and thrombocytopenia.

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