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Evaluation of patient treatment response in oncology ward of teaching hospital

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Abstract

This study aimed report to the clinical outcomes of patients receiving treatment in oncology ward of HUSM Kelantan. The study was conducted using longitudinal study design of prospective evaluation of all the patients admitted in the oncology ward of HUSM in study duration. A total of patients 45 with 19 types of cancer that is 31 (68, 89%) patient still continue chemotherapy, 1 (2, 2%) patient completed 6 cycles of chemotherapy, patient 7 (15, 56%) still continue radiotherapy, 2 (4,4%) patient completed to chemotherapy and radiotherapy and for plan to still observation to patient choice the treatment. aPTT values in oncology ward patients with high range from pre, during and post chemotherapy. To the RBC, hemoglobin and hematocrit before and during chemotherapy is normal while the value of RBC, hemoglobin and hematocrit after chemotherapy is lower than normal. Study concluded that laboratory values among patients receiving chemotherapy were not stable and further administration of chemotherapy cycle would cause severe adverse clinical outcomes.

Key-Words: Myelosuppresion, Chemotherapy, APTT, Hematology

Introduction

The cancer malignant tumors prevalence mortality rate is commonly high after heart disease. Cancer continues to increase globally, especially due to aging and a growing world population with increasing behaviors, especially smoking, in countries developing economies[1]. Based on Globacan 2008 estimates, approximately 12.7 million cancer cases in the world and 7.6 million cancer deaths estimated to occur in 2008; 56% of cases and 64% of deaths occur in developing economies. Breast cancer is the most commonly diagnosed cancer and leading cause of cancer death among women, where 23% of the total cancer cases and 14% of cancer deaths. Lung cancer is the cancer most commonly affects men, consisting of 17% of the total cancer cases and 23% of cancer death.[1] Cancer is one of non-communicable diseases in public health problem, both globally and in Indonesia. In the world, 12% of all deaths caused by cancer and the second highest mortality rate after cardiovascular disease[2].

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WHO and the World Bank, 2005 estimates that every year, 12 million people worldwide suffer from cancer and 7.6 million of them died. If not controlled, an estimated 26 million people will suffer from cancer and 17 million died of cancer in 2030. Ironically, these events will occur more rapidly in under developing and developing countries [12].

According to author (Prof. Tjandra Yoga), in Indonesia the prevalence of tumor / cancer was 4.3 per 1000 population. Cancer is the seventh leading cause of death (5.7%) after a stroke, tuberculosis, hypertension, injuries, prenatal, and DM [2].

While based on the Hospital Information System (SIRS) in 2007, breast cancer ranks first in hospitalized patients in all hospitals in Indonesia (16.85%), followed by cervical cancer (11.78%). This is the same as the estimate Globacan (IACR) 2002.

Added, the highest cancer suffered by women with breast cancer Indonesia is the incidence of 26 per 100,000 women, followed by cervical cancer by 16 per 100,000 women. According to data from SIRS 2007, bronchus and lung cancer cases in hospitalized patients of 5.8% of all cancers.

Breast cancer is now also the leading cause of cancer death among women in developing countries, a shift from previous decades in which the most common

cause of death was cancer of the cervix[1]. Furthermore, the burden of mortality for lung cancer in women in developing countries are higher than cervical cancer with an estimated 11% of female cancer deaths[1]. Although overall cancer incidence rates in developing countries is half that seen from the developed world in both sexes, the overall cancer death rate is generally the same[1]. Survival of cancer patients tend to be more miserable in the developing world, most likely due to new patients know the diagnosis in the final stages of the disease so that treatment is likely to be late[1].

A total of 21 773 cancer cases in peninsular Malaysia in 2006 and listed on the National Cancer Registry which consists of 9974 men and 11 799 women [4]. Age standardized incidence rate (ASR) estimate the number of cancer patients in 2006 was 131.3 per 100,000. and the most common cancer among five populations of Peninsular Malaysia in 2006 were breast, colorectal, lung, cervical, and nasopharyngeal [4].

Most of the weight of the world for the prevention of cancer is how cancer through the application of existing knowledge and implementation of cancer control program for tobacco control, vaccination (for liver and cervical cancer), and early detection and treatment, as well as public health campaigns to promote physical activity and intake of healthy foods[1].

Various ways can be done to treat cancer such as surgery, chemotherapy, radiotherapy, hormone therapy and therapeutic imunomodulator [13]. Surgery can be done for cancers that are at a particular location and are labor that allows for appointment [13].

Chemotherapy is a treatment of cancer containing cytotoxic drugs, in which each type of cancer has a different chemotherapy protocol. Radiotherapy, also referred to as radiation therapy, radiation oncology or therapeutic radiology, is one of the three principal modalities used in the treatment of malignant disease (cancer), the other two being surgery and chemotherapy. In contrast to other Medical Specialties That Mainly rely on the clinical knowledge and experience of medical specialists, radiotherapy, with its use of ionizing radiation in the treatment of cancer, relies Heavily on modern technology and the collaborative professionals Whose Efforts of Several coordinated team approach greatly influences the outcome of the treatment [3].

Hormone therapy is usually for a specific type of cancer that is like prostate cancer, breast cancer, ovarian cancer and thyroid cancer. Hormone therapy also increases the quality of life Cancer Patients [13].

Immunomodulatory therapy is a therapy which is usually derived from herbal plants. This therapy works to boost the immune system to its name immunomodulator[13].

Any action taken against the cancer patient refers to the existing guidelines such as: 1) guidelines are often used USA is the American Cancer Society (ACS), the National Comprehensive Cancer Network (NCCN) and American Society of Clinical Oncology (ASCO), 2) European guidelines frequently used is the European Society for Medical Oncology (ESMO). NCCN guidelines are widely used globally.

The risk of developing cancer increases age along with gender, race and personal and family medical history, are risk factors for cancer. Other risk factors are largely related to lifestyle choices, while certain infections, occupational exposures and some environmental factors can also be related to developing cancer [14].

For tumor and early-stage cancers can be removed surgically [13]. If an advanced stage then it can be removed surgically with chemotherapy or surgery with radiation [13]. Guidelines for chemotherapy can be seen from the existing guidelines.

The selection of appropriate therapy will determine the quality of life patients. In addition management in cancer treatment is also important as 1) pain management in cancer patients, the selection of appropriate analgesic with minimal side effects [5]. 2) management of nausea and vomiting due to cancer patient will usually experience it after the patient getting chemotherapy so that the antiemetic administration is important[6]. 3) prophylactic management for cancer patients in general will experience a decrease in immunity due to side effects of cytotoxic drugs drugs / chemotherapy to suppress the production of blood components in the spinal cord so that the white blood cell will also be reduced [7].

The selection of chemotherapy drugs to a patient should also be adjusted to cost benefit, effectiveness, and patient condition[13]. Successful treatment of a patient's chemotherapy is given depends on chemotherapy[13]. If patients receive appropriate chemotherapy, intravenous drip right, the cycle of administration is also right it will get appropriate clinical outcome[13]. Selection of chemotherapy must also consider the clinical condition of patients when patients with disorders of the kidney before it is given cytotoxic drugs such as cisplatin should be monitored prior creatinine clearance as well as giving patients doxorubisin which should be monitored prior electrocardiography (ECG) patient [13].

Literature suggested that every year women and men of all ages are diagnosed and even die from this disease. The selection of therapy and appropriate management therapy will improve patient quality of life is to give

appropriate clinical outcome can even reduce mortality rate.

Methodology

The research was conducted using longitudinal study design and methods of a prospective evaluation in all patients in the oncology ward HUSM during stay in Hospital. Data obtained from medical records of all patients admitted to the ward with direct observation of the patient or family of patients treated at the oncology ward of HUSM. Intake of medical record data were recorded at HUSM include quantitative and qualitative data the completeness of patient data (such as age, sex, history of present illness, previous medical history, family history, previous drug history, therapeutic measures, diagnosis, physical examination , investigation, etc.data taken transferred to the data collection sheets were prepared. Lack of medical records is equipped with a look at the condition of the patient directly.

Inclusion: All patient cancer (oncology and hematology)

Exclusion: All patient in hematology ward but that patient only hepatitis, liver disease not cancer or malignancy.Clinical evaluation of patients who looks before, during and after administration of treatment from laboratory value. Data were analyzed descriptively and the calculation amount and percentages presented in the form of tabulations and diagrams with inferential statistics used to calculate significancie. The results are discussed in the form of descriptive reports based on the literature.

Study conducted on 19 types of cancer with a total of 45 patient multiple myeloma patient, namely 3, 4 patient nasopharingeal Cancer (NPC), 4 patient lymphoplasmacytoid lymphoma, lung cancer patient 2, 7 DLBCL patient, 1 patient NHBCL, a prostate cancer patient, a patient tongue cancer, 6 colon cancer patient, 3 T-ALL patient, patient 2 ALL, 1 patient B-ALL, one osteosarcoma patient, patient 2 AML, 1 patient Ewing sarcoma, a soft tissue sarcoma patient, 1 patient sigmoid cancer, 3 breast patient cervical cancer and a cancer patient. Study of 45 patients is seen how the clinical outcomes of patient treatment are used. For the treatment of cancer there are three main treatments is always in the oncology ward, namely surgery, chemotherapy and radiotherapy. Treatment here will be used for each of the cancer diagnosis on the patient and how clinical laboratory values must also based on patient.

Results and Discussion

A sociodemographic data collected included: gender, race, age, length of treatment and the presence or absence of smoking. Table 4.1 is based on patients who were observed during the study amounted to 45 people consisting of 41 males (91.1%) and 4 women (8.9%), 43 people came from the Malay race and second race of people originating from China. 1 (2.2%) diangnosa the first half of 2008, one (2.2%) of the first diagnosis in 2009, two (4.4%) of the first diagnosis in 2010, 22 people (48.9%) first diagnosed in 2011 and 19 (42.2%) of people The first diagnosis in 2012, 2.2% of patients had a history of cancer in families and 31.1% of patients are smokers.

Table 1: Sociodemographic oncology patients

Characteristic	N(%) / Mean ± SD
Gender	
Male	41 (91.1)
Female	4 (8.9)
Age	48.11 ± 17.116
Race	
Malay	43 (95)
Chinese	2 (4.4)
First Diagnosed	
2008	1 (2.2)
2009	1 (2.2)
2010	2 (4.4)
2011	22(48.9)
2012	19(42.2)
Family History Cancer	
Yes	1 (2.2)
No	44 (97.8)
Smoking	
Yes	14 (31.1)
No	31 (68.9)

Figure 1 display there are 9 types of actions that are given to patients at 27 (60%) patients received chemotherapy, two (4.4%) patients received radiotherapy, two (4.4%) patients received radiotherapy, six (13.3%) patients only observation, 2 (4.4%) patients received surgery and chemotherapy, one (2.2%) patients received surgery and radiotherapy, one (2.2%) patients received surgery, chemotherapy and radiotherapy, 3 (6.7%) patients received chemotherapy and radiotherapy, 2 (4.4%) patients receiving chemotherapy actions, observations and plans for radiotherapy and 1 (2.2%) patients received surgery, chemotherapy and observation.

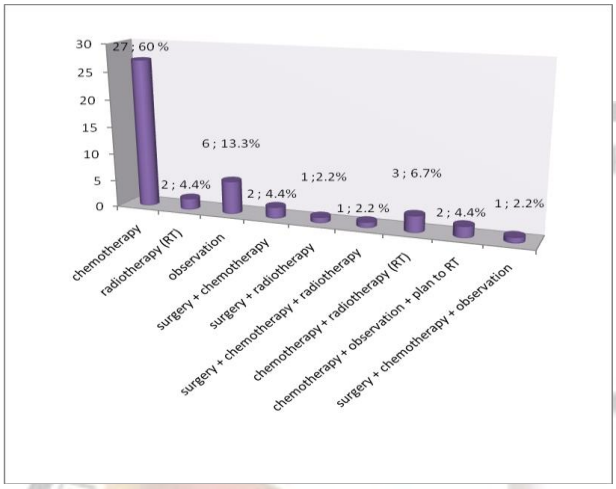

Fig. 1: Medications for Oncology Patients

Figure 2 shows for the highest INR (International Normalized Ratio) value after chemotherapy, while for the high aPTT (activated partial thromboplastin time) values during chemotherapy.

Table 2 represents the value of total protein, albumin, globulin, AST and ALT less than the post chemotherapy prior to chemotherapy, while the value for total bilirubin higher post chemotherapy than before chemotherapy.

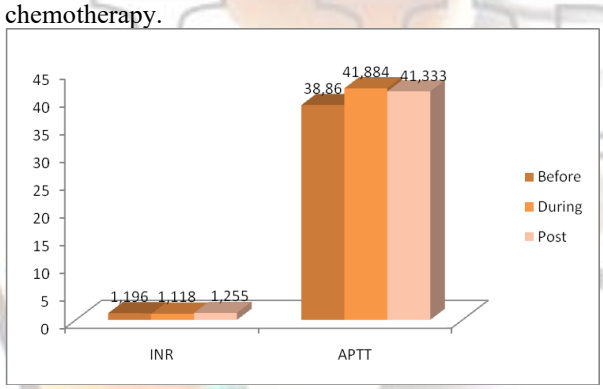

Fig. 2: INR, APTT Before, During, and Post Chemotherapy

Table 3 explain to review the value of total blood an average of 45 patient was still within the normal range, except for RBC, hemoglobin, hematocrit and platelet count after chemotherapy is lower than normal**.** Table 4 explain obtained from a study conducted five clinical outcomes, patient 45 with 19 (42.22%) types of cancer that is 31 (68.89%) patient still continue chemotherapy, 1 (2.2%) patient completed 6 cycles of chemotherapy, 7 (15.56%) patients still continue radiotherapy, 2 (4.4%) patients completed to chemotherapy and radiotherapy and four plan to still observation to patient choice the treatment. Table 5 shows clinical outcomes obtained from oncology patients during the study is still continuing chemotherapy; completed 6 cycles of chemotherapy; still continue radiotherapy; has completed chemotherapy and radiotherapy planning; still observed. Table 6 shows from a study of 45 patient with 19 different types of diseases that can be used for the treatment of each cancer type. For multiple myeloma, 2 and 1 patient using a chemotherapy patient use after chemotherapy plan radiotherapy. For NPC, 4 (8.8%) patients using chemotherapy. Lymphoplasmacytoid lymphoma, 2 (4.4%) patients using chemotherapy, 1 (2.2%) patients observation and one (2.2%) patient still receiving chemotherapy treatment and surgery afther that observation. For lung cancer one (2.2%) patient received chemotherapy and one (2.2%) patient still observation. For DLBCL patient 4 received chemotherapy, 1 (2.2%) patient receiving radiotherapy treatment, a patient still observation, 1 (2.2%) patient received chemotherapy and observation then plan to radiotherapy. To NHBCL, 1 (2.2%) patient received chemotherapy then surgery and radiotherapy. For prostate cancer, one (2.2%) patient received surgery then radiotherapy. For tongue cancer, one (2.2%) patient received radiotherapy. Colon cancer, the five (11.1%) patients received chemotherapy and 1 (2.2%) patient perfomed chemotherapy that after surgery. For T-ALL, 2 (4.4%) patients received chemotherapy, one (2.2%) patient still observation. For ALL, one (2.2%) patient received chemotherapy and one (2.2%) patient still observation. For B-ALL, one (2.2%) patient received chemotherapy. For osteosarcoma, one patient (2.2%) received chemotherapy.AML, 1 (2.2%) patient received chemotherapy and one (2.2%) patient still observation. For Ewing sarcoma, 1 (2.2%) patient received chemotherapy. For soft tissue sarcoma, 1 (2.2%) patient received chemotherapy. For sigmoid cancer, 1 (2.2%) patient received chemotherapy. For breast cancer, 3 (6.67%) patients received chemotherapy after surgery and radiotherapy.

Prospective research carried out for 2 months at HUSM Oncology wards, which conducted the study 45 patients with a percentage for more men than women are men (91.11%). While the average age of patients with cancer was 48 years old with a mean ± SD (48.11 ± 17 116). Race is the cancer most races Malay (95%). New patients are generally aware of the disease so we get the data in medical records of patients; most patients know the diagnosis of the disease in 2011. Study has been carried out 45 Patients with a variety of treatment are surgery, chemotherapy and radiotherapy. Among the most patient treatment is a chemotherapy treatment (table 6).

Based on the available studies have been conducted in oncology patients aPTT values are high ranging from

pre chemotherapy, during chemotherapy and post chemotherapy (Figure 2). This can be caused by NSAIDs are used as a pain killer drugs to cope with the cancer patient in which one effect of NSAIDs is platelet thrombocytopenia is reduced and time APTT will be long[2]. However liver function disorder with hematologic malignancies may also lead to increase the risk of the length of time aPTT due to vitamin K which is a blood clotting factor is also produced in liver[3]

Study finding showed total average pre protein obtained among all patients was mean of 70.79 g / dl which is still within normal values (66-83 g / dl) as well as the total protein during chemotherapy was also within the normal value was 69.11 g / dl in contrast the total protein post value was lower than normal is 53.50 g / dl. Not only the value of total protein albumin and globulin but the post chemotherapy was also low at 32.5 g / dl and 21 g / dl. In the study conducted found that the value of total protein, albumin and globulin was low at post chemotherapy on patients diagnosed DLBCL (hematology), where DLBCL is a cancer of large B cells most commonly that grows in a diffuse pattern completely effacing the normal lymph architecture DLBCL node [4]. The lymph organs include the bone marrow, thymus, spleen, and lymph nodes[4]. Where according to the literature of patients with hematological malignancies at high risk of thrombotic or hemorrhagic complications DLBCL is hemorrhagic [5]. Solid blood component are proteins such as albumin and globulin so that bleeding cause decrease in body total protein . For patients acute lymphoma leukemia (ALL) hipoalbumin because chemotherapy drugs are often used in this treatment are asparaginase [17,18,19,20] . For the ALP, AST, ALT before, during and after chemotherapy in the limit of normal values as well as the value of total bilirubin. The AST, ALT and total bilirubin pre, during and post chemotherapy within normal (table 2).

Findings also showed that average value of WBC pre, during and post chemotherapy among patients was within normal range (table 3). In contrast RBC, hemoglobin and hematocrit pre and during were normal range but post chemotherapy were lower than normal, this might be one of the side effect of chemotherapeutic drugs that lead to myelosupresive, which would interfere with the formation of myelosupresive blood count in the bone marrow and the formation of RBC would be disturbed, the amount of hematocrit and hemoglobin will also be reduced[6]. As the value of MCV, MCH and MCHC pre, during and post chemotherapy were within the pre and during platelet normal range.

LDH may be increased due to a defect in the body such as impaired liver function and cancer so the high value found for LDH among patients before and after chemotherapy [11] (table 4).

In general, patients were still continuing chemotherapy such as multiple myeloma patient 3, 4 Nasopharingeal cancer patient, 2 patient lymphoma, lung cancer patient 2, 4 DLBCL patient, patient 6 Ca colon, 2 T-ALL patient, one ALL patient, 1 patient B- ALL, one osteosarcoma patient, 1 patient AML, 1 patient Ewing sarcoma, a soft tissue sarcoma patient, 1 patient sigmoid cancer and a breast cancer patient so that the total patients that this is 31.Hanya 1 clinical outcomes of patients who had completed six cycles of chemotherapy that is lymphoblastic lymphoma patients. For patients who still continue radiotherapy were 7 patients including one patient lymphoblastic lymphoma, 1 DLBCL patients, 1 patient NHBCL, a prostate cancer patient, one patient's tongue cancer and two breast cancer patients. Two patients with DLBCL had completed chemotherapy and plan for radiotherapy and 1 patient with cervix cancer. Four patient were still in a state of observation for selection of right therapy, DLBCL patient, T-ALL patients, patient ALL and AML patient (table 6).

Conclusion

Study concluded that the laboratory monitoring values were unstable among patients receiving chemotherapy and further administration of chemotherapeuthic drug would might lead to severe adverse clinical outcomes. Myelosuppresy chemotherapy drugs have the effect of which would impede and cause the blood components to be reduced from normal ranges. Clinically high range of platelets count has been found among patients with chemotherapy. RBC count observed to be lowered with the post chemotherapy treatment.

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Table 2: Liver Review among Study Population of Study Population

Characteristic	Normal Value	Mean ± SD		
		Pre	During	Post
Tot. Protein	66-83 d/dl	70.79 ± 12.311	69.11 ± 16.458	53.50 ± 2.121
Albumin	35-52 g/dl	37.07 ± 4.480	33.88 ± 4.518	32.50 ± 0.707
Globulin	25-44 g/dl	34.67 ± 12.134	33.38 ± 17.606	21.00 ± 1.414
T.Bil	5-21 µmol/L	10.50 ± 7.243	17.63 ± 12.035	25.00 ± 11.314
AST	11-47 U/L	39.20 ± 30.864	41.13 ± 38.849	21.50 ± 3.536
ALT	0-55 U/L	39.00 ± 41.437	54.63 ± 52.663	20.50 ± 16.263

Table 3: Total Blood Review of Study Population

Characteristic	Normal Value	Mean ± SD		
		Pre	During	Post
WBC	4-11.10^3/uL	7.94 ± 5.14	8.9979 ± 10.47664	6.91 ± 4.36
RBC	3.9-5.6 .10^6/uL	4.05 ± 1.03	4.0773 ± 0.80549	3.57 ± 0.24
HgB	11.5-16.4 g/dL	12.53 ± 3.71	11.331 ± 2.8300	10.45 ± 1.65
Hct	36-47 %	35.65 ± 5.59	33.449 ± 8.7257	31.98 ± 4.93
MCV	76-96 fl	83.66 ± 14.33	85.769 ± 4.5945	81.95 ± 9.20
MCH	27-32 pg	27.64 ± 6.09	28.709 ± 1.4950	25.98 ± 3.99
MCHC	32-36 g/dl	33.29 ± 1.83	33.205 ± 1.1996	32.40 ± 0.76
PLT	150-400.100/L	255.14 ± 144.33	155.57 ± 107.717	140.67 ± 83.23
Neut#	1.5-5.5. 10^6 u/L	4.41 ± 4.19	3.5864 ± 2.06663	3.79 ± 2.09
Lymph #	0.9-5.2.10^6 u/L	1.95 ± 2.29	1.1755 ± 0.86534	1.25 ± 2.22
Mono #	0.16-1.00.10^6u/L	1.25 ± 2.22	1.6170 ± 2.96716	0.56 ± 0.56
EO #	0.08-0.28.10^6u/L	0.44 ± 0.96	0.0589 ± 0.09185	0.17 ±0.22
BASO #	0.01-0.05.10^6u/L	0.06 ± 0.06	0.3100 ± 0.78646	0.06 ± 0.11
ANC	> 1.5 .10^3 /mm^3	5.16 ± 2.99	4.39 ± 2.42	8.31 ± 4.57

Table 4: Cardiac Enzymes of Study Population

Characteristic	Normal Value	Mean ± SD		
		Pre	During	Post
LDH	< 248 u/L	704.91 ± 581.665	2318.71 ± 3662.830	1261.00

Table 5: Clinical Outcomes of the Cancer Patients

Characteristic	N (%)
Still Continue Chemotherapy	31 (68.9)
Completed Chemotherapy cycle 6th	1 (2.2)
Still Continue Radiotherapy	7 (15.5)
Completed to Chemotherapy and Plan for Radiotherapy	2 (4.4)
Still Observation to Choice the Treatment	4 (8.9)

Table 6: Comparison Type of Cancer (Diagnosis of Admission) and Treatment

Type of Cancer	Treatment								P value*
	Chemotherapy	Radiotherapy	Observation	Surgery +Chemotherapy	Surgery+ Radiotherapy	Surgery+ Chemotherapy+Radiotherapy	Chemotherapy+Observation+ Plan To Radiotherapy	Surgery+ Chemotherapy+Observation	
Multiple myeloma	2 (7.4)	-	-	-	-	-	1(50)	-	0.112
NPC	4 (14.8)	-	-	-	-	-	-	-	
Lymphoplasmacytoid	2 (7.4)	-	1(16.7)	-	-	-	-	1(100)	
Lung cancer	1 (3.7)	-	1(16.7)	-	-	-	-	-	
DLBCL	4 (14.8)	1(50)	1(16.7)	-	-	-	1(50)	-	
NHBCL	-	-	-	-	-	1(25)	-	-	
Prostate cancer	-	-	-	-	1(100)	-	-	-	
Colon cancer	5 (18.5)	-	1(16.7)	-	-	-	-	-	
ALL	1 (3.7)	-	1(16.7)	-	-	-	-	-	
B-ALL	1 (3.7)	-	-	-	-	-	-	-	
Osteosarcoma	1 (3.7)	-		-	-	-	-	-	
AML	1 (3.7)	-	1(16.7)	-	-	-	-	-	
Ewing sarcoma	1 (3.7)	-	-	-	-	-	-	-	
Soft tissue sarcoma	1 (3.7)	-	-	-	-	-	-	-	
Sigmoid cancer	1 (3.7)	-	-	-	-	-	-	-	
Breast cancer	-	-	-	-	-	-	3(75)	-	
Cervix cancer	-	-	-	1(50)	-	-	-	-	