The Prevalence of Neoplasm Diseases and Investigation of Some Biochemical Serum Parameters

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ABSTRACT

Aim: We aimed in this work to investigate the skin, lung, and bone marrow-related cancer prevalence and biochemical serum parameters of all these cancer patients.

Materials and Methods: The skin, lung, and bone marrow cancer patient's biochemical serum data examined retrospectively using a hospital information system.

Results: Basal cell carcinoma patients number recorded as 155 with 63%, squamous cell carcinoma patients number were enrolled in73 with 30% and, malign melanoma patients number noted as 10 with 4%. Skin cancers were the most seen cancer type in 246 patients with 22% between 2013-2017 years. All cancer patient numbers were 1134 between these years. The common incidences of basal cell carcinoma and squamous cell carcinoma cancers observed on the upper part of the body, respectively on the face-cheek, nose, ear, eyelid, and lip. In this study, there was a significant difference among skin cancer patient's serum glucose, aspartate aminotransferase, alanine aminotransferase, sodium, bilirubin direct, bilirubin total, creatinine, urea level, and control group serum parameters level, p<0.05. The lung cancer patient numbers were 119 with 10.4%, bone marrow patients numbers were 113 with 10%. Two cancer groups were statistically different in terms of 5-years survival. Log Rank X^2 = 8.68, p<0.05.

Conclusions: We recorded that skin cancer types and regions on the upper parts of the body were more because of exposure to the sun. The lung cancer survival rate was lower than bone marrow cancer. Moreover, we strongly emphasized that measuring the biochemical serum parameters was statistically significant with the diagnosis of cancer patients.

Keywords:
Carcinoma; Malignant; Skin cancer; Lung; Incidence; Bone marrow.

INTRODUCTION

Cancer is a very complex illness happening via genetic variation or anomaly that allows the conversion of healthy cells into disordered cells, which results in interaction among the genetic factors and environmental factors [1]. Skin is the prevalent malignant neoplasms site. Skin cancers have a higher incidence than others in summation [2]. Skin cancer constitutes a prevalent group of malignant neoplasms among white people. The frequency of melanoma and non-melanoma skin cancer (NMSC) increased throughout the world [3]. Skin cancers include basal cell carcinoma (BCC) and squamous cell carcinoma (SCC), generally called NMSC, and melanoma skin cancers are the most recurrent cancer both in America and in other developed countries with mostly fair-skinned people [4]. Melanoma is the utmost mortal type of skin cancer and has turned into one of the widespread cancers among people in their teens in Canada, especially for women. Among all NMSC examples, almost 77% are BCC, and 23% are SCC. Even though seldom mortal, the high ratio of NMSC indicates a notable load of illness in the way of morbidity, the standard of living, social effect, and healthcare expenditures [5]. The incidences of skin cancers were found high in Australia. It has four times more prevalence than other whole cancers [6]. Melanoma and NMSC's risk factors include exposure to ultraviolet (UV) radiation and the susceptibility of a person's skin to UV radiation [7]. Also to X-rays, Human papilloma virüs, arsenic compounds, and other chemical products [8]. The commonly seen region of NMSC is on the head and neck area, and surgery remains the mainstay of treatment [9]. Lung cancer is the most common cancer in the world. It is one of the deadliest and most aggressive types of cancer, with a 5-years survival rate of barely 15%. Every year 1.7

million people die of lung cancer in the world. 80-90% of lung cancer cases are due to smoking, making lung cancer one of the most preventable cancer types [10]. The two main types of lung cancer are non-small cell lung cancer (NSCLC) and small cell lung cancer (SCLC). There are three types of NSCLC; 40% of the cases are adenocarcinoma, 30% of squamous cell carcinoma (SCC), and 15% of large cell carcinomas. The Small cell lung cancer rate is 15%. These tumors are classified by histology, and as the size of biopsy specimens becomes smaller, the assessment of immunohistochemistry plays an important role [11]. Bone marrow is the primary hematopoietic organ involved in many malignant diseases, include acute and chronic leukemia, multiple myeloma, myelodysplastic syndrome, and bone metastasis from solid tumors [12]. We aimed to identify the incidence of skin cancers, lung cancers, and bone marrow cancers, according to type in the Siirt province. And to compare the incidence of them with other regions, with this analysis at first, to provide up-to-date prevalence approximate by sex, age, body site, survival; and second, to research the levels of some serum parameters in cancers patients and healthy person comparatively.

MATERIALS AND METHODS

Before starting to work, both the Public Health Directorate and the Siirt State hospital preauthorization documents were about the feasibility of the work. In this study, the files of patients who applied to Siirt State Hospital and Siirt Public Health units and were diagnosed with a neoplasm or malign were between 2013-2017. Patients were diagnosed with neoplasm constituted the experimental group, and healthy subjects were the control group. The study is a retrospective study. The files of the patients were diagnosed with neoplasm were applied to the polyclinics evaluated. Our work was on women and men. The study was composed of experimental and control groups. The experimental group consisted of patients with various neoplasms (skin cancers, lung cancer, bone marrow cancer), and the control group consisted of healthy subjects who received routine control. Fasting blood glucose, amylase, alanine aminotransferase (ALT), aspartate aminotransferase (AST), lactate dehydrogenase (LDH), electrolytes values , and biochemical findings retrospectively took from patient files. Biochemical parameters studied in the biochemistry laboratory of Siirt State Hospital using Advia autoanalyzer 1800. Cancer statistics collected with an active cancer registry system in many countries of the world. While the active cancer registry was in only two provinces of our country in 2002, it was put into practice in 81 Provinces as of 2013. Statistical analyzes performed using the SPSS 21. 0 statistical program for Windows to evaluate the data obtained

from patient files and the hospital information system. Independent student t-test was used for parametric tests when data distributed normally. P values were less than 0.05 were assigned statistically.

RESULTS

Skin cancers: In 2013, the number of skin cancer patients was 66 in 235 cancer cases, and the skin cancer rate was 28%. In 2014, the number of cancer patients was 321, and the number of skin cancer patients number was 57, and the rate was 17.7%. In 2015, the number of cancer patients was 314, and the number of skin cancer cases was 52 and 16.5%. In 2016, the number of cancer patients was 124, and in 36 skin cancer cases detected, and the rate was 29%. In 2017, the number of cancer patients recorded 140, and the ratio of skin cancer's in all cancers was 25%. In 2013, the number of patients with BCC 37; 21 males and 16 females, 23 patients with SCC; 14 males and nine females. Three male malignant melanoma patients. The number of BCC patients in 2014 was 31; 17 males and 14 females, Number of SCC patients 20; 14 males and six females. It was two males and one female malignant melanoma patient. The number of BCC patients in 2015 was 34; 19 males and 15 females, the number of SCC patients was 19; 14 males and five females. one male and one female malignant melanoma patient recorded. The number of patients with BCC in 2016 was 25; 12 male and 13 female, the number of SCC patients were six; four males and two females. One male malignant melanoma, one male Kaposi's sarcoma, and one female Kaposi's sarcoma were. In 2017, the number of patients with basal cell cancer was 28; 13 males and 15 females, number of SCC patients were five; three males and two females. One female malignant melanoma was. Among the related years, 143 male skin cancer patients and 103 female skin cancer patients were. The overall skin cancer rate in men was 58%, while the skin cancer rate in women was 42%. Blood serum data of patients with malignant melanoma, BCC, and SCC cancer evaluated retrospectively using a hospital information system. The incidence of patients determined. The number of BCC patients was 155 with 63%, and the number of SCC patients was 73 with 30%, and the number of patients with malignant melanoma was 10 with 4%. The most common type of cancers are skin cancers, and the rate of it among five years in all cancers types recorded as 22% with a total of 246 patients. Non-melanoma, the most common skin cancers; the most common incidences of BCC and SCC cancers was observed on the upper part of the body, respectively on the face-cheek, nose, ear, eyelid, and lip at table 1.

The number of skin cancers was observed in approximately 49 patients each year. The incidence of skin cancers

Table 1. The incidence of skin cancer in the body region of patients.

Location	BCC n	%	SCC n	%	Total n	% Total
Nose	23	17.5	5	3.8	28	21.3
Face-Cheek	29	22.1	6	4.5	35	26.7
Ear	13	9.9	10	7.6	23	17.5
Lip	6	4.5	9	6.8	15	11.4
Neck	6	4.5	2	1.5	8	6.1
Eye Lid	19	14.5	3	2.2	22	16.7
Total	96	73	35	27	131	100

Figure 1. Kaplan-Meier, survival of lung cancer and bone marrow cancer patiens between 2013-2017 years.

was detected in almost 16 patients in the 100000 population in Siirt. All cancer incidence found as 76 patients in 100000 population. Between the given years the number of all cancer patients was calculated as 1134 years. Serum parameters levels of skin cancer patients compared with the control group serum parameters. In this study, skin cancer patient's serum glucose, AST, ALT, sodium, bilirubin direct, bilirubin total, creatinine, urea level were statistically significantly different compared with the control group's serum parameters levels, $p < 0.05$. It can be seen below from the group's statistics, table 2.

Lung and bone marrow cancers, In 2013, 23 out of 235 cancer cases, 9.8% were Lung cancer. The number of bone marrow cancer patients was 19 and 8%. In 2014, the number of cancer patients was 321, and the number of lung cancer cases was 38, with a rate of 11.8%. Bone marrow cancer cases were 35 and 11%. In 2015, the number of cancer patients was 312, and the number of lung cancer cases was 37 and 16.5%. Bone marrow cancer cases were 31 and 9.6%. In 2016, the number of cancer patients was 124, and Lung cancer detected in 12 cases, the rate was 9.7%. Bone marrow cancer cases are 12 and 9.7%. In 2017, the number of cancer patients recorded 140, the number of lung cancers among all cancers was nine, and their rate was 6.4%. Bone marrow cancer cases were 16 and 11.4%. 2013 Number of lung cancer patients was 23; 17 Male and 6 Female, Number of bone marrow cancer patients were 19; 14 Men and 5 Women. 2014 Number of lung cancer patients was 38; 30 Male and 8 Female, Number of bone marrow cancer patients were 35; 22 males and 13 females. 2015 Number of lung cancer patients was 37; 31 Male and six females, Number of bone marrow cancer patients were 31; 23 Men and 8 Women. 2016 Number of lung cancer patients was 12; six males and six females, number of bone marrow cancer patients were 12; eight males and four females. 2017 Number of lung cancer patients was 9; nine Mae. The number of bone marrow cancer patients was 16; eight male and eight females. Between 2013 and 2017, 93 male lung cancer patients and 26 female lung cancer patients registered. The proportion of the total number of lung cancer patients seen in men was 78%, and the proportion of
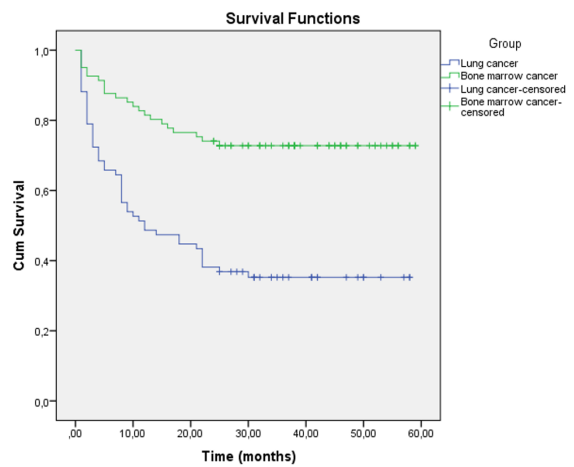
women was 22%. Between 2013-2017, 75 male bone marrow cancer patients and 38 female bone cancer patients registered. The proportion of bone marrow cancer patients in the total number of patients with bone marrow cancer was 66.4%, and the rate of women was 33.6%. The number of lung cancer patients was recorded as 119 to 10.4%, while the number of bone marrow patients was 113 to 10%. The incidence of lung cancer was approximately 24 each year, and the number of bone marrow cancer patients was 23 each year. The number of all cancer patients calculated as 1134 between these years. The number of patients with lung cancer was 76, and the number of patients with bone marrow cancer was 81.49 (64.5%) of lung cancer patients, and 22 (27.2%) of bone marrow cancer patients died between these years. Kaplan-Mier test shows the comparison of two disease group's statistical differences within using long rank, Breslow, and Tarone-Ware tests. $p < 0.05$. Fig. 1.

In 2013, for 5-year survival analysis, the number of patients with lung cancer was 23, and the number of patients with bone marrow cancer was 19. 16 (69.6%) of the lung cancer patients and 4 (21.1%) of the bone marrow cancer patients died. Two cancer groups were statistically different in terms of 5-years survival according to three tests. Graph 1. Kaplan-Miear survival analysis. Log Rank $X^2 = 8.68$, $p = 0.001$, $p < 0.05$. Breslow $X^2 = 7,249$, $p = 0.007$, $p < 0.05$. Tarone-Ware $X^2 = 8.009$, $p = 0.005$, $p < 0.05$. Fig. 2.

In this study, there was a statistically significant difference between lung cancer and bone marrow cancer patient's serum glucose, AST, GGT, LDH, urea level compared with the control group's serum parameters levels, $p < 0.05$. Cancer patient's biochemical serum markers Pearson Correlation analyses did. As shown in table 3.

There was a positive correlation between serum levels of AST and LDH. A positive relationship was between se-

Table 2. The skin cancer patient and control group statistics.

|	Patient Group				Control Group			
	N	Mean	Std. Deviation	Std. Error Mean	N	Mean	Std. Deviation	Std. Error Mean
Age	36	59,0556	22,46896	3,74483	40	39,5500	13,97424	2,20952
Glucose mg/dl	36	106,5000	28,47906	4,74651	40	95,8500	11,21023	1,77249
Creatinine mg/dl	36	0,9214	0,24316	0,04053	40	0,7558	0,16659	0,02634
AST U/L	36	22,5278	6,70388	1,11731	40	18,1000	5,75482	0,90992
ALT U/L	36	18,4167	6,55689	1,09282	40	32,6500	9,84899	1,55726
GGT U/L	27	29,5185	25,11262	4,83293	36	20,5278	10,86406	1,81068
Amylase U/L	25	72,2800	36,92167	7,38433	34	65,0294	24,24807	4,15851
LDH U/L	30	258,2000	124,52375	22,73482	35	176,1714	43,11031	7,28697
Biluribin D. mg/dl	23	0,2426	0,25234	0,05262	39	0,1328	0,05652	0,00905
Sodium mmol/L	35	139,7143	4,42966	0,74875	35	137,6857	1,81126	0,30616
Potassium mmol/L	34	4,2676	0,44635	0,07655	35	4,2086	0,46233	0,07815
Albumin g/dl	25	4,1920	0,46361	0,09272	32	3,9438	0,67151	0,11871
Bilirubin T. mg/dl	24	0,6992	0,33521	0,06842	40	0,5290	0,23366	0,03695
Phosphor mg/dl	18	3,0389	0,71549	0,16864	28	3,5643	0,53070	0,10029
Calcium mg/dl	30	9,0757	0,55776	0,10183	37	9,1262	0,44774	0,07361
Magnesium mg/dl	19	2,1474	0,57083	0,13096	31	1,9484	0,16707	0,03001
Uric Acid mg/dl	17	4,1412	1,38251	0,33531	28	4,0143	1,10913	0,20960
Urea mg/dl	36	34,2444	12,36436	2,06073	40	23,5063	6,38312	1,00926
Chlore mmol/L	22	101,6364	3,86123	0,82322	34	103,3529	1,73873	0,29819
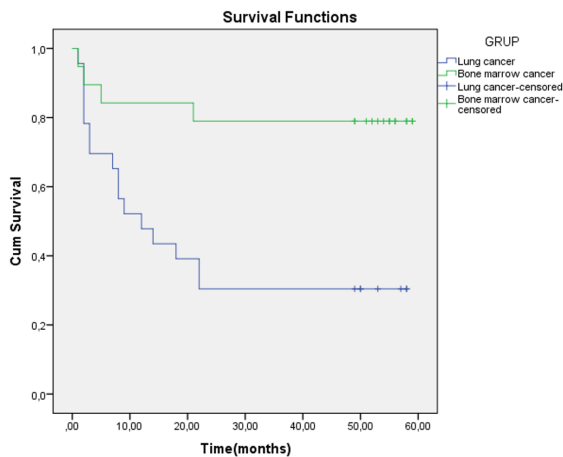
Figure 2. Kaplan-Meier, 5-years survival of lung cancer and bone marrow cancer patients.

rum AST and LDH levels. Their levels increased in a correlatively (r= 0,490**, p=0,001). Fig. 3.

In this study, there was a positive correlation (r= 0,534**, p=0,001) between serum levels of ALT and Uric acid. Fig. 4.

AST and Urea levels were found correlated positively. (r= 0,602**, p=0,001). Fig. 5.

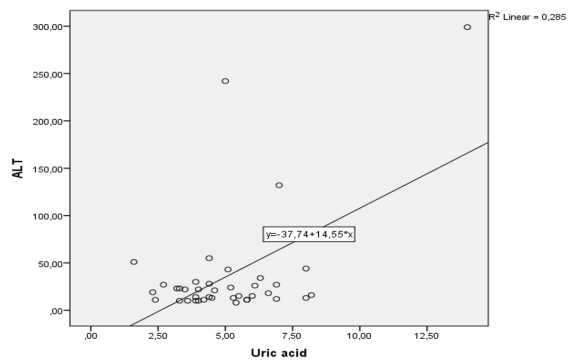**Figure 3.** Serum AST and LDH levels correlation.

DISCUSSION

Risk factors of skin cancers include; having light skin color, excessive sunlight, exposure to X-rays, exposure to chemicals such as coal tar or arsenic, a family history of skin cancer, diseases of genetic repair disorders [13]. When the cases evaluated in terms of incidence, the most common type of cancer was skin cancer (27. 7%) in Hatay in 2008 [14]. We also detected that the most observed cancer type in Siirt was skin cancer too. The rate of five years in all cancers recorded as 22% in Siirt. When the

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Table 3. Skin, lung, and bone marrow cancer patients biochemical serum markers Pearson Correlation analysis.

		Creatinin mg/dl	AST U/L	ALT U/L	LDH U/L	Potassium mmol/L	Albumin g/dl	Bilirubin total mg/dl	Uric acid mg/dl	Urea mg/dl
Creatinin mg/dl	Pearson Correlation	1	,169	,119	,053	,333**	-,184	,023	,444**	,563**
	Sig. (2-tailed)		,135	,295	,661	,003	,143	,852	,005	,000
AST U/L	Pearson Correlation	,169	1	,796**	,490**	,299**	-,282*	,234	,699**	,602**
	Sig. (2-tailed)	,135		,000	,000	,008	,023	,058	,000	,000
ALT U/L	Pearson Correlation	,119	,796**	1	,331**	,213	-,144	,257*	,534**	,498**
	Sig. (2-tailed)	,295	,000		,005	,061	,254	,037	,000	,000
LDH U/L	Pearson Correlation	,053	,490**	,331**	1	-,129	-,404**	,341**	,517**	,430**
	Sig. (2-tailed)	,661	,000	,005		,287	,001	,006	,001	,000
Potassium mmol/L	Pearson Correlation	,333**	,299**	,213	-,129	1	,081	-,220	,401*	,267*
	Sig. (2-tailed)	,003	,008	,061	,287		,521	,076	,013	,020
Albumin g/dl	Pearson Correlation	-,184	-,282*	-,144	-,404**	,081	1	-,351**	-,477**	-,402**
	Sig. (2-tailed)	,143	,023	,254	,001	,521		,006	,004	,001
Bilirubin total mg/dl	Pearson Correlation	,023	,234	,257*	,341**	-,220	-,351**	1	,252	,263*
	Sig. (2-tailed)	,852	,058	,037	,006	,076	,006		,165	,036
Uric asit mg/dl	Pearson Correlation	,444**	,699**	,534**	,517**	,401*	-,477**	,252	1	,751**
	Sig. (2-tailed)	,005	,000	,000	,001	,013	,004	,165		,000
Urea mg/dl	Pearson Correlation	,563**	,602**	,498**	,430**	,267*	-,402**	,263*	,751**	1
	Sig. (2-tailed)	,000	,000	,000	,000	,020	,001	,036	,000	

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
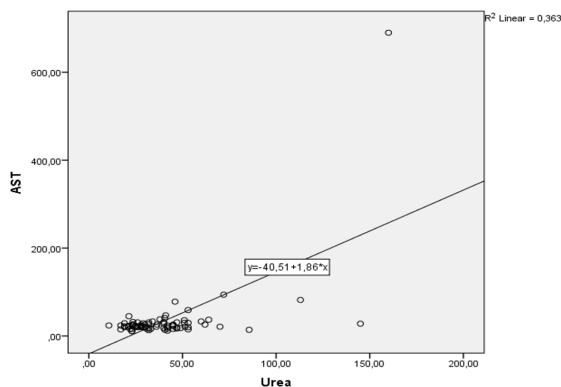

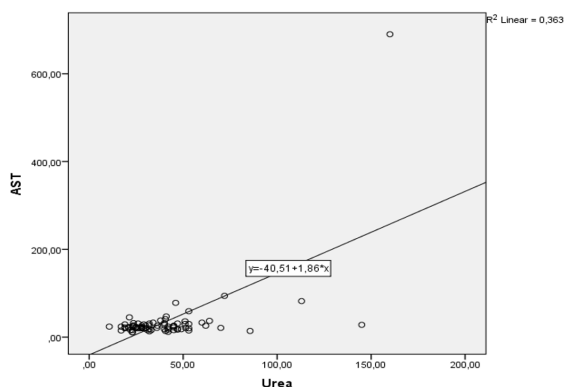**Figure 4.** Serum ALT and Uric acid levels correlation.

Figure 5. Serum AST and Urea levels correlation.

literature reviewed, skin cancer is more likely to occur in males than in females [14]. In a study in both women and men, the median diagnosis age was 71 years. NMSC is observed most often on the face and body [15]. The prevailing sites opened to strong sunlight, such as hands, the face, neck, and forearms [16]. Our study complies with this study, NMSC has occurred on face site, but the average age of skin cancer in our study was 60 years and low. According to another study, a significant increase in skin cancer in the province of Hatay requires serious attention to environmental factors and genetics. The risk factors for enlargement of skin cancers are going ultraviolet rays, ionizing radiation, human papillomavirus infections, infrared radiation, inorganic arsenic, trauma, immunosupp-

ression, and genetic diseases. It reported that alcohol and smoking, nutrition, and obesity participated enlargement of various cancers such as skin cancers [14]. For all skin cancers, 60% of the cases and more were on the regions of skin most opened to the sun, corresponding to the face, scalp, and neck [17]. A rising tendency in inpatient NMSC and melanoma skin cancer of the head and neck region, correlating to an increase in reconstructive procedures applied in the inpatient setting and high expense load [18]. In our study, BCC lesions were commonly observed in the face-cheek region 30 % (29/96), nose 24 % (23/96), and lesions with SCC were most frequently in-ear region 28. 6% (10/35). Precaution actions such as using a broad-spectrum sunscreen, wearing protective dressing,

looking for shade, and limiting the time open-air during mid-day hours are very beneficial when started in early life [19]. Increasing the level of education and consciousness of people in less developed countries is crucial for early diagnosis of the patient and timely treatment to decrease the mortality of the illness [20]. From our literature reviews, people should attend to some scientific outcomes to live healthily and especially not get caught skin cancer. We do not recommend anyone go out in the open air between 10 am and 4 pm when the sun's rays are potent. Outdoor activities must perform in the morning or evening. People must use sunscreen even if they have a darker skin tone. Lips, ears, hands, and necks should not forget. Protective clothes must be wear. Tanning beds must be skipped. Medications must be checked. Protective moisturizers and makeup should be used throughout the year. If skin cancers are detected early, they can be treated successfully. People can go to the dermatologist once a year to do a skin cancer scan. It has described that the cancer tissue displayed a high ratio of aerobic glycolysis than other tissues, and it recommends the analysis of biochemical markers in neoplasm. Blood serum; alkaline phosphatase, lactate dehydrogenase, calcium, magnesium, and amylase studied in various cancers as potential diagnostic and prognostic biochemical markers. It was observed that AST and ALT as tumor markers used in the control of malignant of the head and neck and cervix uteri [21]. The serum LDH levels of the skin, lung, and bone marrow patients whose data we examined were statistically significant compared with the control group. A high increase in serum activities of ALT, AST, and GGT was noted in both liver and colon cancer patients relative to the control group and among cancer types. These enzymes can be used as tumor markers in the prognosis, diagnosis, and treatment of cancer, especially in colon and liver cancers [22]. In our study, a significant difference was in these enzyme levels after patients with skin and lung cancer diseases compared with the control group.

In the study based on the province of Siirt, the rate of males was higher than females in terms of lung and bone marrow cancers. Cancer increases with aging. The incidence of these cancers was lower than in western regions. The survival rate of lung cancers was lower than bone marrow cancers. While lung cancer is one of the deadliest cancers with five-year survival rates of at most 15%, the population (80% of the sample) believe that survival rates exceed 20% [10]. In 2013, For 5-year survival analysis, the number of patients with lung cancer was 23, and the number of patients with bone marrow cancer was 19. 16 (69.6%) of the lung cancer patients and 4 (21.1%) of the bone marrow cancer patients died. Two cancer groups were statistically different in terms of 5-years survival. Log Rank X2 = 8.68, p = 0.003, p<0.05. In this study, there was a statistically significant difference between lung cancer and bone marrow

cancer patient's serum glucose, AST, GGT, LDH, urea levels compared with the control group serum parameters level, p<0.05. The Kaplan-Meier test was used for the survival comparison of patients in the two disease groups. There was a significant difference at p <0.001 level between the two groups. Because serum or plasma provides the physiological and pathological state, it offers the most useful studied biological substances for cancer biomarkers [23]. Breast cancer patients with high LDH levels have a 1.42-fold increased risk of death [24]. From our results, LDH and AST can be used as biochemical markers in skin cancers, lung cancers, and bone marrow cancer cases. LDH can be considered a good biomarker for the diagnosis of liver, muscular, and cancer diseases [25]. In this study, a positive correlation found between serum levels of AST and LDH, ALT and Uric acid, and AST and urea. Their levels increased correlatively. In this study, skin cancer patient's serum glucose, AST, ALT, sodium, bilirubin direct, bilirubin total, creatinine, urea level were statistically significantly different compared with the control group's serum parameters levels, p <0.05. Also, a statistically significant difference was between lung cancer and bone marrow cancer's serum glucose, AST, GGT, LDH, Urea levels, and the serum parameters of the control group, p <0.05. For this reason, it is important to study the biochemical parameters found to be statistically significant in all situations that show the symptoms of these diseases and to make their measurements more sensitive.

CONCLUSION

In conclusion, with our outcomes and the literature, the BCC and SCC observed ratio and the locations of them on the body were significant to comply with the literature and lower even though Siirt were in the Southeast region and takes too much sun in a day. Biochemical serum parameters measured in this article were convenient to investigate and detect skin, lung, and bone marrow, cancer patients. Besides, this study was retrospective, only the recorded in one state hospital data analyzed. Therefore, multicenter studies with large patient populations are also needed.

ACKNOWLEDGEMENT

CONFLICT OF INTEREST

Authors approve that to the best of their knowledge, there is not any conflict of interest or common interest with an institution/organization or a person that may affect the review process of the paper.

AUTHOR CONTRIBUTION

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