ORİJİNAL ARAŞTIRMA ORIGINAL RESEARCH

DOI: 10.5336/healthsci.2022-91806

Cancer Incidence and Survival in Sivas Province 2013-2019: A Retrospective Cohort Study

Sivas İli 2013-2019 Yılları Kanser İnsidansı ve Sağkalımı: Retrospektif Kohort Çalışması

İrem AKOVA[a]

[a]Department of Public Health, Sivas Cumhuriyet University Faculty of Medicine, Sivas, Türkiye

ABSTRACT Objective: This study's aim was to examine the incidence and survival of cancer in Sivas between 2013-2019. **Material and Methods:** In this retrospective cohort study, cancer registry data were analysed. Age, sex, treatment types, definitive pathological diagnosis results, and survival status of patients were questioned. **Results:** A total of 7,946 people were diagnosed with cancer in the years examined and 57.5% of the patients were male. Systemically the most common type of cancer was digestive organ cancers (20.2%) (stomach, colon, anorectal, respectively). The most common cancers in male were prostate (16%), skin (14%), and bronchopulmonary (12%). The most common cancers in female were breast (22%), thyroid (16%), and skin (14%). The cancer incidence was between 1.4 per thousand and 2.3 per thousand. Life expectancy was shorter ($p<0.001$), and the mortality risk was 1.6 times higher in male. The risk of cancer mortality increased with increasing age. Respiratory system and intrathoracic organ cancers were the cancers that caused the death and shortened the life span most ($p<0.001$). **Conclusion:** It was found that the cancer incidence tended to increase, and that the cancer mortality was higher in male and respiratory system organ cancers. It is important to keep detailed records (especially by including the stage and treatment protocols) in the follow-up of cancer cases.

Keywords: Neoplasms; incidence; survival; sex; treatment

ÖZET Amaç: Bu çalışmanın amacı, 2013-2019 yılları arasında Sivas ilinde kanser insidansını ve sağkalımını incelemektir. **Gereç ve Yöntemler:** Bu retrospektif kohort çalışmasında kanser kayıt verileri incelendi. Kanser hastalarının yaş, cinsiyet, aldığı tedavi türleri, kesin patolojik tanı sonuçları ve sağkalım durumu sorgulandı. **Bulgular:** İncelenen yıllarda toplam 7.946 kişi kanser tanısı almıştı ve hastaların %57,5'i erkekti. En çok görülen kanser tipi sindirim organları kanserleriydi (%20,2) (sırasıyla mide, kolon, anorektal). Erkeklerde en sık görülen kanserler prostat (%16), deri (%14) ve bronkopulmoner (%12) kanserdi. Kadınlarda en sık görülen kanserler meme (%22), tiroid (%16) ve deri (%14) kanseriydi. Kanser insidansı binde 1,4 ile binde 2,3 arasındaydı. Erkeklerde yaşam süresi daha kısaydı ($p<0,001$) ve mortalite riski 1,6 kat fazlaydı. Yaş ilerledikçe kanser mortalite riski arttı. Ölüme en fazla neden olan ve yaşam süresini en fazla kısaltan kanser, solunum sistemi ve intratorasik organ kanserleriydi ($p<0,001$). **Sonuç:** Kanser insidansının artış eğiliminde olduğu ve kanser mortalitesinin erkeklerde ve solunum sistemi organı kanserlerinde daha yüksek olduğu saptandı. Kanser vakalarının takibinde, kayıtların (özellikle evre ve tedavi protokolleri dahil edilerek) ayrıntılı olarak tutulması çok önemlidir.

Anahtar Kelimeler: Tümörler; insidans; sağkalım; cinsiyet; tedavi

Cancer is a group of diseases characterized by uncontrolled proliferation and spread of abnormal cells, and if the spread cannot be controlled, it can result in death.[1] Noncommunicable diseases are now responsible for the majority of global deaths, and cancer is expected to be the leading cause of death and the single most important barrier to increasing life expectancy in every country in the world in the 21st century.[2] According to the estimates of the World Health Organization (WHO) in 2015, cancer is the first or second cause of death before the age of 70 in 91 of 172 countries and ranks third or fourth in 22 countries.[2]

Determination of cancer incidence and mortality data is essential for cancer control in all countries. These data may affect public health and clinical service planning.[3] It was estimated that there were 19.3 million new cancer cases worldwide in 2020 and 10.0

Correspondence: İrem AKOVA
Department of Public Health, Sivas Cumhuriyet University Faculty of Medicine, Sivas, Türkiye
E-mail: irem-007@hotmail.com

Peer review under responsibility of Turkiye Klinikleri Journal of Health Sciences.

Received: 06 Jun 2022 ***Received in revised form:*** 17 Jan 2023 ***Accepted:*** 02 Mar 2023 ***Available online:*** 07 Mar 2023

million people died from cancer.[4] The predicted increase in the number of cancer cases until 2040 is 47%.[4] With the increase in urbanization and development, cancer risk factors such as adopting a sedentary lifestyle, increasing elderly population, decreasing fertility, diet and environmental pollution are changing. However, with the development of health care and imaging methods, early diagnosis and effective treatment have become more possible.[5] Cancer risk factors and treatment options are affected by regions and socioeconomic status.[6,7] By evaluating cancer mortality and incidence from a socioeconomic and regional perspective, inequalities in the health system can be recognized and beneficial health care arrangements can be made.[8,9] The aim of this study was to examine the incidence and survival of cancer in Sivas province between 2013-2019 according to age groups, sex, and cancer types.

MATERIAL AND METHODS

PARTICIPANTS AND DESIGN

In this retrospective cohort study, the cancer registry data of the Health Directorate for the years 2013-2016 was examined. Cancer patients' age, sex, treatment types, definitive pathological diagnosis results, and survival status were questioned. Population information for incidence calculation was obtained from the Turkish Statistical Institute website. Histological and topographic classifications of cancer types were made according to the codes in the third edition of the International Classification of Diseases Oncology book published by the WHO. Ethical approval (date: February 16, 2022, no: 2022-02/02) was obtained from Sivas Cumhuriyet University Non-Interventional Clinical Research Ethics Committee. Institutional permission (date: March 21, 2022, no: 2022/04) was obtained. The study was conducted in accordance with the 2008 principles of the Declaration of Helsinki (http://www.wma.net/en/30publications/10policies/b3/index.html).

STATISTICAL ANALYSIS

Study data were evaluated with the SPSS 22.0 (IBM Corp., Armonk, NY, USA) package program. Numerical variables were presented with descriptive statistics such as mean, standard error, 95% confidence interval (CI), and lower and upper limit values. Categorical variables were given as numbers and percentages. Pearson chi-square test, Cox regression analysis and Kaplan-Meier survival analysis (Log Rank) were performed. Statistics such as hazard ratio and 95% CI were reported when presenting the Cox regression analysis findings. Since information about cancer stages could not be reached, these were not included in the analysis. Patients whose treatment type was unknown in the analysis related to the treatment type were excluded from the analysis. Since the number of patients who received hormonal therapy (1.2%) and immunotherapy (0.1%) was very low, these treatment types were also not analysed. Sex and age groups of the patients were included in the model while conducting the Cox regression analysis. In the Cox regression analysis of the treatment type, each treatment type was included in the models separately, depending on whether they were applied or not. The error level was taken as 0.05.

RESULTS

DISTRIBUTION OF MAIN ORGAN INVOLVEMENT

Between 2013 and 2019, a total of 7,946 people were diagnosed with cancer. The mean age of the patients was 60.8±14.9 (minimum: 0, maximum: 100) and 4,565 (57.5%) were male. Systemically the most common type of cancer was digestive organ cancers (20.2%). The most common digestive organ cancers were stomach (7.6%), colon (6.0%) and anorectal (2.5%) cancers, respectively. According to organ involvement, skin (14%), prostate (10%), breast (9%), thyroid (8%) and bronchopulmonary (8%) cancers were the most common cancers. The most common cancers in male were prostate (16%), skin (14%), bronchopulmonary (12%), bladder (11%) and stomach (9%) cancers, respectively. The most common cancers in female were breast (22%), thyroid (16%), skin (14%), uterus (6%), and stomach (5%) cancers (Table 1, Figure 1).

DISTRIBUTION OF CANCER INCIDENCE

In the years examined, cancer incidence ranged from 1.4 per thousand (lowest in 2017) to 2.3 per thousand

TABLE 1: Distribution of main organ involvement by sex (2013-2019).

Main organ involvement	Male (n, %)	Female (n, %)	Total (n, %)	χ^2, *p* value
Oral cavity and pharynx	**86, 1.9**	**51, 1.5**	**137, 1.7**	
Mouth	51, 1.1	40, 1.2	91, 1.1	
Pharynx	35, 0.8	11, 0.3	46, 0.6	
Digestive organs	**1053, 23.1**	**555, 16.4**	**1608, 20.2**	
Oesophagus	54, 1.2	19, 0.6	73, 0.9	
Stomach	421, 9.2	181, 5.4	602, 7.6	
Small intestine	31, 0.7	13, 0.4	44, 0.6	
Colon	300, 6.6	178, 5.3	478, 6.0	
Rectosigmoid junction	36, 0.8	20, 0.6	56, 0.7	
Rectum, anus, anal canal	121, 2.7	74, 2.2	195, 2.5	
Liver and intrahepatic bile duct	44, 1.0	22, 0.7	66, 0.8	
Gallbladder and other biliary	13, 0.3	22, 0.7	35, 0.4	
Pancreas	31, 0.7	26, 0.8	57, 0.7	
Other digestive organs	2, 0.0	0, 0.0	2, 0.0	
Respiratory system and intrathoracic organs	**703, 15.4**	**124, 3.7**	**827, 10.4**	
Nasal cavity and middle ear	3, 0.1	3, 0.1	6, 0.1	
Larynx	83, 1.8	4, 0.1	87, 1.1	
Lung and bronchus	553, 12.1	97, 2.9	650, 8.2	
Pleura, mediastinum, thymus, heart, and others	64, 1.4	20, 0.6	84, 1.1	
Bones and joints	**24, 0.5**	**16, 0.5**	**40, 0.5**	
Hematopoietic and reticuloendothelial system	**72, 1.6**	**50, 1.5**	**122, 1.5**	
Skin	**635, 13.9**	**471, 13.9**	**1106, 13.9**	
Peripheral nerves and autonomic nervous system	**3, 0.1**	**1, 0.0**	**4, 0.1**	3105.125, **<0.001**
Retroperitoneum and peritoneum	**10, 0.2**	**16, 0.5**	**26, 0.3**	
Connective tissue, subcutaneous, other soft tissues	**45, 1.0**	**39, 1.2**	**84, 1.1**	
Breast	**16, 0.4**	**736, 21.8**	**752, 9.5**	
Female genital organs	**0, 0.0**	**430, 12.7**	**430, 5.4**	
Vulva, vagina	0, 0.0	23, 0.7	23, 0.3	
Cervix uteri	0, 0.0	59, 1.7	59, 0.7	
Uterus	0, 0.0	200, 5.9	200, 2.5	
Ovary, others	0, 0.0	148, 4.4	148, 1.9	
Male genital organs	**837, 18.3**	**0, 0.0**	**837, 10.5**	
Prostate	760, 16.6	0, 0.0	760, 9.6	
Testis	77, 1.7	0, 0.0	77, 1.0	
Urinary tract	**681, 14.9**	**150, 4.4**	**831, 10.5**	
Kidney	163, 3.6	94, 2.8	257, 3.2	
Ureter	12, 0.3	5, 0.1	17, 0.2	
Bladder	506, 11.1	51, 1.5	557, 7.0	
Eye, brain, central nervous system's other parts	**113, 2.5**	**98, 2.9**	**211, 2.7**	
Eye	3, 0.1	4, 0.1	7, 0.1	
Meninges	12, 0.3	14, 0.4	26, 0.3	
Brain	93, 2.0	76, 2.2	169, 2.1	
Spinal cord, cranial nerves	5, 0.1	4, 0.1	9, 0.1	
Thyroid and other endocrine glands	**158, 3.5**	**543, 16.1**	**701, 8.8**	
Thyroid	143, 3.1	528, 15.6	671, 8.4	
Adrenal gland, others	15, 0.3	15, 0.4	30, 0.4	
Lymph nodes	**75, 1.6**	**57, 1.7**	**132, 1.7**	
Undefined	**22, 0.5**	**14, 0.4**	**36, 0.5**	
Unknown	**32, 0.7**	**30, 0.9**	**62, 0.8**	
Total	**4565, 100.0**	**3381, 100.0**	**7946, 100.0**	

N: Number of patients; χ^2 Chi-square test.

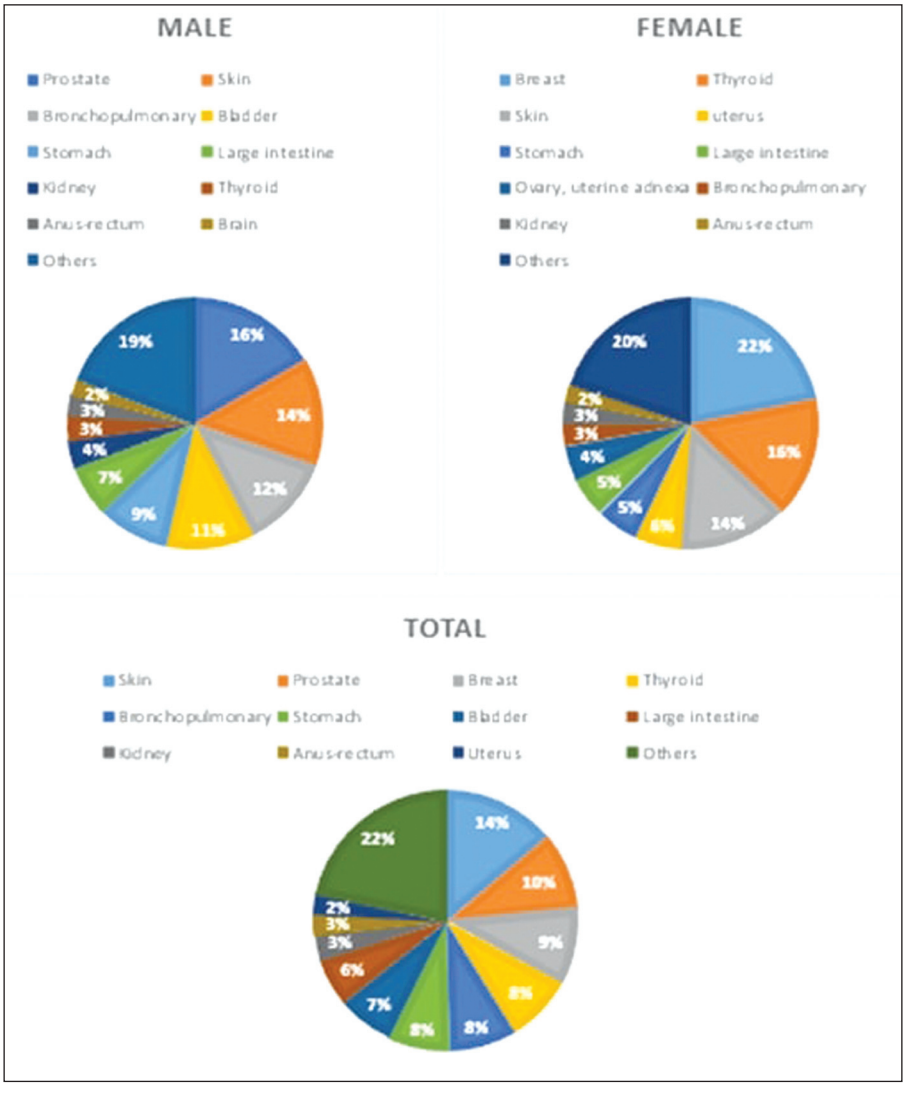

FIGURE 1: Distribution of patient's main organ involvement (2013-2019).

(highest in 2014). From 2017 to 2019 (1.9 per thousand), it was observed that the incidence of cancer tended to increase. The incidence of cancer was higher in males than females in all the years examined (Figure 2).

DISTRIBUTION OF CANCER CASES

The number of cancer cases was increasing with age, and the age range with the highest number of cases was 60-69. It was observed that the number of female cases was higher in cancers detected before the age of 50, while the number of male cases was higher in cancers detected after the age of 50 (Figure 3).

DISTRIBUTION OF PATIENTS' SURVIVAL STATUS AND TIMES

Table 2 presents the distribution of patients' survival status and times according to sex, age, main organ involvement, and treatment. It was determined that 20.5% of the patients died in 2013-2019 (in all 7-year cases). Mortality rate was higher ($p<0.001$), and life expectancy was shorter in males than females ($p<0.001$). When analysed according to age groups, the mortality rate under 65 years of age was lower ($p<0.001$) and life expectancy was longer ($p<0.001$). Respiratory system and intrathoracic organs cancers were the cancers that caused the most death and

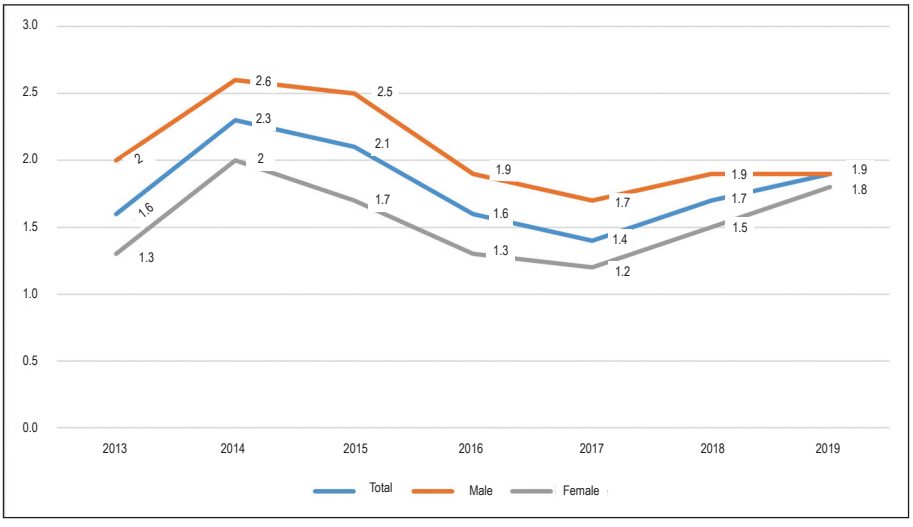

FIGURE 2: Distribution of cancer incidence by sex (per thousand).

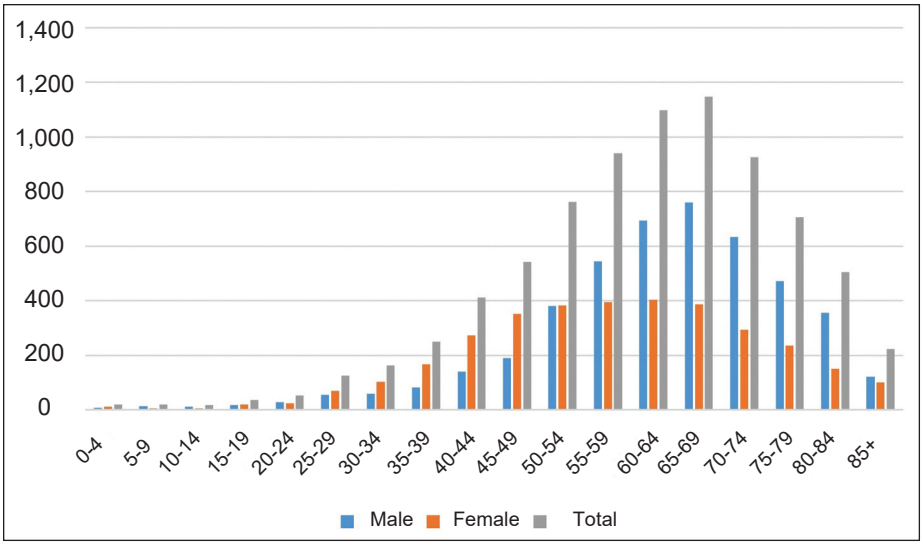

FIGURE 3: Distribution of cancer cases by sex and age (2013-2019).

shortened the life span the most ($p<0.001$). Thyroid, skin, and breast cancers were the cancers with the highest survival rate ($p<0.001$). The cancer with the longest life expectancy was breast cancer ($p<0.001$). Cancers that underwent surgical treatment were found to have better survival and lower mortality, but since stage information is not available, this information needs to be evaluated with caution ($p<0.001$) (Table 2).

MORTALITY

Cox regression model predicting mortality according to patients' sex and age groups is given in Table 3. The risk of mortality was 1.6 times higher in men with cancer. It was observed that the risk of cancer mortality increased with increasing age. The risk of mortality was 1.5 times higher in the 65-74 age group, 2.2 times higher in the 75-84 age group, and 3.4 times higher in those aged 85 and over (Table 3).

Table 4 shows the Cox regression models predicting mortality according to treatment type. It was determined that the risk of mortality increased 1.8 times when surgical treatment was not applied. Radiotherapy and chemotherapy did not make a significant difference in mortality (Table 4). However, since stage information cannot be obtained, this information should be evaluated with caution.

TABLE 2: Distribution of patients' survival status and times according to sex, age, main organ involvement, and treatment.

Characteristic	Survival status		Survival time (day)
	Alive (n, %)	Dead (n, %)	X±SE (95% CI)
Sex			
Male	3415, 74.8	1151, 25.2	602.5±35.1 (533.8±671.3)
Female	2900, 85.8	480, 14.2	717.8±57.8 (604.6±831.1)
	χ^2=144.245, p<0.001		Log-rank test=106.253, p<0.001
Age at diagnosis (years)			
<65	3761, 84.8	676, 15.2	801.6±51.4 (700.8±902.3)
65-74	1583, 76.3	491, 23.7	629.3±37.6 (555.6±702.9)
75-84	822, 67.8	391, 32.2	392.9±18.7 (356.2±429.6)
≥85	149, 67.1	73, 32.9	286.7±31.8 (224.3±348.9)
	χ^2=211.439, p<0.001		Log-rank test=262.2, p<0.001
Main organ involvement			
Oral cavity and pharynx	114, 83.2	23, 16.8	538.9±44.9 (451.0±626.9)
Digestive organs	1008, 62.7	600, 37.3	394.3±19.9 (355.3±433.4)
Respiratory system and intrathoracic organs	449, 54.3	378, 45.7	342.0±20.9 (301.1±382.9)
Bones and joints	25, 62.5	15, 37.5	474.3±84.7 (308.3±640.4)
Hematopoietic and reticuloendothelial system	86, 70.5	36, 29.5	555.3±49.6 (458.1±652.5)
Skin	1038, 93.9	68, 6.1	885.7±71.4 (745.8±1025.6)
Peripheral nerves and autonomic nervous system	3, 75.0	1, 25.0	549.0±0.0 (549.0±549.0)
Retroperitoneum and peritoneum	16, 61.5	10, 38.5	309.8±57.3 (197.4±422.1)
Connective tissue, subcutaneous, other soft tissues	66, 78.6	18, 21.4	488.3±49.3 (391.7±584.8)
Breast	700, 93.1	52, 6.9	1153.3±190.1 (780.8±1525.9)
Female genital organs	379, 88.1	51, 11.9	606.7±42.8 (522.7±690.6)
Male genital organs	746, 89.1	91, 10.9	772.9±79.9 (616.4±929.4)
Urinary tract	711, 85.6	120, 14.4	951.4±98.6 (758.0±1144.7)
Eye, brain, central nervous system's other parts	138, 65.4	73, 34.6	497.8±43.3 (412.9±582.8)
Thyroid and other endocrine glands	681, 97.1	20, 2.9	880.1±63.6 (755.4±1004.7)
Lymph nodes	101, 76.5	31, 23.5	530.9±44.8 (443.1±618.8)
Unknown	54, 55.1	44, 44.9	259.9±29.2 (202.8 317.2)
	χ^2= 1127.004, p<0.001		Log-rank test=670.495, p<0.001
Overall	6315, 79.5	1631, 20.5	669.7±30.9 (608.9±730.4)
Treatment*			
Chemotherapy	1101, 72.1	425, 27.9	611.0±35.9 (540.7±681.4)
No chemotherapy	2565, 82.9	528, 17.1	768.4±37.6 (694.7±842.2)
	χ^2= 72.513, p<0.001		Log-rank test=0.119, p=0.731
Surgical	4180, 86.7	643, 13.3	923.8±54.3 (817.3±1030.3)
No surgical	608, 62.0	373, 38.0	505.8±33.9 (439.2±572.3)
	χ^2= 344.132, p<0.001		Log-rank test=80.249, p<0.001
Radiotherapy	467, 70.0	200, 30.0	564.3±31.2 (503.2±625.5)
No radiotherapy	3106, 80.9	732, 19.1	737.6±31.5 (675.8±799.4)
	χ^2=41.241, p<0.001		Log-rank test=0.311, p=0.577

n: Number of patients; χ^2 Chi-square test; X: Mean; SE: Standard error; *Those whose treatment type was unknown were not included; CI: Confidence interval.

DISCUSSION

One out of every 5 people in the world is diagnosed with cancer during their lifetime, and 1 out of 8 male and 1 out of 11 female die from cancer.[4] In Türkiye, with the increase in the population, the number of cancer patients diagnosed annually is also increasing. Although statistical comparison was not made, while the incidence of cancer in Türkiye was 2.6 per thousand in 2018, it was 2.8 per thousand in 2020.[10] Similarly, although statistical comparison was not made in our study, we observed that the incidence of can-

TABLE 3: Cox regression model predicting mortality according to patients' sex and age groups (n=7,946).

	B	p value	HR	95% CI
Sex				
Female				1.00
Male	0.472	**<0.001**	1.602	1.439-1,785
Age groups				
<65				1.00
65-74	0.430	**<0.001**	1.537	1.368-1.728
75-84	0.797	**<0.001**	2.218	1.956-2.516
≥85	1.219	**<0.001**	3.383	2.656-4.309

n: Number of patients; HR: Hazard ratio; CI: Confidence interval.

TABLE 4: Cox regression models predicting mortality according to treatment type*.

	n	B	p value	HR	95% CI
Chemotherapy	1,526				1.00
No chemotherapy	3,093	-0.023	0.731	0.978	0.860-1.112
Surgical	4,823				1.00
No surgical	981	0.577	**<0.001**	1.781	1.567-2.025
Radiotherapy	667				1.00
No radiotherapy	3,838	0.045	0.577	1.046	0.894-1.224

*Those whose treatment type was unknown were not included; n: Number of patients; HR Hazard ratio; CI: Confidence interval.

cer has increased at the regional level in recent years (2017-2019).

According to 2020 data, the most common cancers worldwide and in Türkiye are female breast cancer and lung cancer (frequency percentages are 11.7-11.4% in the world, 10.3-17.6% in Türkiye, respectively).[4,10] In the studies conducted in İzmir and Bingöl, similar to our study, digestive organs cancers were the most common cancer according to the systems.[11,12] When evaluated according to gender, the most common cancers in male worldwide are lung cancer and prostate cancer, while breast cancer and lung cancer in female.[4] In Türkiye, while the ranking in male is the same as in the rest of the world, breast and thyroid cancers are in the first 2 ranks in female.[10] The findings in our study were also compatible with the data of Türkiye.

It has been reported that the risk of developing cancer before the age of 75 in Türkiye is 29.2% in male and 18.4% in female.[10] Similar to our study, the incidence of cancer in male in Türkiye is significantly higher than in female.[10] Previous studies in different regions of Türkiye (Sivas, Hatay, Van, and İzmir) also support this finding.[11,13-15] In our country, it has been reported that one out of every 4 people before the age of 75 is diagnosed with cancer.[10] In our study, we found that the number of cancer cases increased with age and that the number of cases was before the age of 70 at most. In the study conducted by Haydaroğlu et al., it was found that cancer was seen at an earlier age in female than in female, similar to our study.[11]

In Türkiye, the risk of cancer mortality is higher in male than in female.[10] As a matter of fact, while the risk of cancer-related death before the age of 75 is 18.2% in male, it is only 8.6% in female.[10] These findings support the findings in our study. Similarly, in a study evaluating the cancer statistics of the United States of America 2001-2016, it was found that the survival of male was worse than that of female.[16] In previous studies in Türkiye, it was observed that the mortality risk was higher in male compared to female, and the survival rate was lower.[11,12] In our study, we also found that the risk of cancer mortality increases, and survival decreases with increasing age. In the study conducted in İzmir, cancer patients were divided into 2 groups as over 20 years old and under 20 years old, and it was reported that the survival of those under 20 years old was better.[11]

Although survival from various types of cancer has increased, recovery is slower in lung and pancreatic cancers; 5-year survival is 18% for lung cancer and 8% for pancreas.[17] In our study, we determined that the cancer that caused the most death and shortened the life span was respiratory system and intrathoracic organs cancers. Thyroid, skin, and breast cancers were the cancers with the highest survival rate. Similar results were obtained in studies conducted in İzmir and Bingöl.[11,12] As a matter of fact, according to 2020 data, it is known that lung cancer is the leading cause of cancer-related deaths worldwide and in Türkiye.[4,10]

In our study, the data we found on cancer treatment methods and its effect on survival and mortality should be evaluated cautiously since stage

information could not be obtained. In the study of Mete et al., in which they examined cancer cases in individuals over 65 years of age, it was found that surgical treatment reduced the risk of death, similar to our study.[12] On the other hand, in the same study, it was reported that chemotherapy also reduced the risk of death, albeit to a lesser extent.[12] Many factors can affect survival rates and treatment success rates in cancer, and the type, grade, and stage of cancer are the 3 main factors affecting survival.[18] In a study conducted in patients with lung cancer, it was found that chemotherapy did not affect survival in patients with high comorbidity scores, and chemotherapy was superior to radiotherapy in patients with low comorbidity scores.[19] In another study, it was reported that the risk of death in cancer patients who underwent radical prostatectomy was 6.9 times lower during the 15-year follow-up period.[20] In a study conducted in patients with lung cancer, it was shown that survival decreases with age and lobectomy increases survival in patients under 65 years of age, but surgical treatment does not have an effect on long-term survival in patients over 65 years of age.[21]

The limitations of our study can be listed as the data obtained from the records and the lack of information about cancer stages.

CONCLUSION

We observed in our study that the incidence of cancer tends to increase, increasing in male and with increasing age. We found that cancer was seen at an earlier age in female than in male. Mortality risk was higher and life expectancy was shorter in male and in advanced age. Systemically, the most common type of cancer was digestive organs cancers. The most common cancers in male were prostate, skin, and bronchopulmonary cancer, respectively. The most common cancers in female were breast, thyroid, and skin cancers, respectively. Respiratory system and intrathoracic organs cancers were the cancers that caused the most death and shortened the life span the most. Thyroid, skin, and breast cancers were the cancers with the highest survival rates. It is important to keep detailed records (especially by including the stage and treatment protocols) in the follow-up of cancer cases. One third of cancers can be prevented with primary prevention and one third with secondary prevention measures. Only one third of them are tried to be kept alive with treatment opportunities. Therefore, to prevent cancer, it is necessary to give importance to protective measures for the person and the environment.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

This study is entirely author's own work and no other author contribution.

REFERENCES

1. American Cancer Society. Cancer Facts & Figures 2019. Atlanta: American Cancer Society; 2019. [Cited: January 18, 2022]. Available from: [Link]
2. World Health Organization [Internet]. [Cited: January 18, 2022]. Global Health Observatory. Geneva: World Health Organization. 2018. Available from: [Link]
3. World Cancer Report 2014. Geneva, Switzerland: World Health Organization, International Agency for Research on Cancer. WHO Press; 2015. [Cited: January 18, 2022]. Available from: [Link]
4. World Health Organization Globocan. Cancer fact sheets, all cancers. 2020. [Cited: January 18, 2022]. Available from: [Link]
5. Singh GK, Jemal A. Socioeconomic and racial/ethnic disparities in cancer mortality, incidence, and survival in the United States, 1950-2014: over six decades of changing patterns and widening inequalities. J Environ Public Health. 2017;2017:2819372. [Crossref] [PubMed] [PMC]
6. Singh GK, Siahpush M, Altekruse SF. Time trends in liver cancer mortality, incidence, and risk factors by unemployment level and race/ethnicity, United States, 1969-2011. J Community Health. 2013;38(5):926-40. [Crossref] [PubMed]
7. Blackwell DL, Lucas JW, Clarke TC. Summary health statistics for U.S. adults: national health interview survey, 2012. Vital Health Stat 10. 2014;(260):1-161. [PubMed]
8. Singh GK, Williams SD, Siahpush M, Mulhollen A. Socioeconomic, rural-urban, and racial inequalities in US cancer mortality: Part I-all cancers and lung cancer and Part II-colorectal, prostate, breast, and cervical cancers. J Cancer Epidemiol. 2011;2011:107497. [Crossref] [PubMed] [PMC]
9. Singh G, Miller B, Hankey B, Edwards B. Area socioeconomic variations in U.S. Cancer Incidence, Mortality, Stage, Treatment, and Survival, 1975-1999. NCI Cancer. Bethesda, MD: National Cancer Institute: NIH Publication No. 03-5417; 2003. [Link]
10. World Health Organization Globocan. Population fact sheets, countries, Turkey. 2020. [Cited: May 11, 2022]. Available from: [Link]
11. Haydaroğlu A, Sert F, Caner A. Ege Üniversitesi Hastanesi veri tabanındaki kanser olgularının epidemiyolojik ve genel sağ kalım özellikleri [Epidemiological and overall survival characteristics of cancer patients in Ege University Hospital database]. Ege J Med. 2019;58(Supplement):1-9. [Crossref]
12. Mete B, Söyiler V, Buzgan B. Cancer incidence and survival analysis among elderly people in Bingol province. Cukurova Med J. 2020;45(1):290-7. [Crossref]
13. Çelikgün S, Koç T, Tuncer E, Özer H, Nur N. Cancer map between 2010-2019 Sivas City. Int J Acad Med Pharm. 2021;3(3):273-6. [Crossref]
14. Arıca S, Nazlıcan E, Özer C, Şilfeler DB, Arıca V, Özgür T, et al. Hatay ilinde 2008 yılı kanser vakaları sıklığı ve dağılımı [The frequency and disribution of cancer cases in Hatay District in 2008]. J Clin Exp Investig. 2011;2(2):192-5. [Crossref]
15. Taşdemir E, Demir C, Dilek İ, Atmaca M. Van ili ve çevresinde malign tümörlerin dağılım sıklığı [The Frequency of the Malignant Tumors in "Van" City and Around]. Van Tıp Derg. 2010;17(4):117. [Link]
16. Dong M, Cioffi G, Wang J, Waite KA, Ostrom QT, Kruchko C, et al. Sex differences in cancer incidence and survival: a pan-cancer analysis. Cancer Epidemiol Biomarkers Prev. 2020;29(7):1389-97. [Crossref] [PubMed]
17. National Lung Screening Trial Research Team; Aberle DR, Adams AM, Berg CD, Black WC, Clapp JD, Fagerstrom RM, et al. Reduced lung-cancer mortality with low-dose computed tomographic screening. N Engl J Med. 2011;365(5):395-409. [Crossref] [PubMed] [PMC]
18. National Cancer Institute (NIH) [Internet]. [Cited: May 21, 2022]. The Surveillance, Epidemiology, and End Results (SEER) Program 2019. Available from: [Link]
19. Lee JH, Wu HG, Kim HJ, Kim DW, Lee SH, Kim TM, et al. Influence of comorbidities on the efficacy of radiotherapy with or without chemotherapy in elderly stage III non-small cell lung cancer patients. Cancer Res Treat. 2012;44(4):242-50. [Crossref] [PubMed] [PMC]
20. Bill-Axelson A, Holmberg L, Ruutu M, Garmo H, Stark JR, Busch C, et al; SPCG-4 Investigators. Radical prostatectomy versus watchful waiting in early prostate cancer. N Engl J Med. 2011;364(18):1708-17. [Crossref] [PubMed]
21. Mery CM, Pappas AN, Bueno R, Colson YL, Linden P, Sugarbaker DJ, et al. Similar long-term survival of elderly patients with non-small cell lung cancer treated with lobectomy or wedge resection within the surveillance, epidemiology, and end results database. Chest. 2005 Jul;128(1):237-45. [Crossref] [PubMed]