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Original Article

Survival Rate and Prognostic Factors in Turkish Women Patients with Breast Cancer

Şebnem Zorlutuna

Department of Econometrics, Faculty of Economics and Administrative Sciences, Sivas Cumhuriyet University, Sivas, Turkey

***Correspondence:** Email: szorlutuna@cumhuriyet.edu.tr

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Abstract

Background: The study aimed to estimate the overall and disease-free survival rates of breast cancer patients and the factors affecting these rates.

Methods: In this retrospective study, data were obtained from 686 patients diagnosed with breast cancer in Sivas Cumhuriyet University Faculty of Medicine Research and Application Hospital Oncology Center between 1988 and 2014. Total population sampling method was used. The survival rates at certain periods were determined by creating a Life Table. By using the Kaplan-Meier Analysis, the mean survival times and rates were determined, and whether the variables had an impact on survival was examined. By applying Cox regression analysis, the effect of prognostic factors that are significant on the survival time of breast cancer patients was examined.

Results: Overall mean survival time was found as 208.4±11.8 months. According to Kaplan-Meier analysis, 1, 5, 10 and 20-years overall survival rates were 96.6 ± 0.07%, 82.3 ± 1.7%, 64.4 ± 3.4% and 49%± 7.4%, respectively. According to Cox regression analysis results, variables that influence overall survival time were found as disease stage, multicentricity status, ECOG (performance status), presence of diabetes, CA15-3 value, neutrophil/lymphocyte ratio. Moreover, variables that had an impact on the disease-free survival time were found as tumor grade, multicentricity, and ECOG.

Conclusion: Many factors other than disease can prolong survival or accelerate death. Considering the findings of this study may be useful in planning the treatment of breast cancer patients have positive affect on overall survival rates.

Keywords: Breast cancer; Survival analysis; Cox regression; Life table; Kaplan-Meier

Introduction

Cancer is a public health issue and problem for both the world and our country with its burden of disease, lethality and increasing tendency. According to the World Cancer Database (GLOBOCAN) 2018 data, global cancer burden reached 18.1 million cases and 9.6 million cancer deaths. The International Agency for Research on Cancer (IARC) estimates that one in five men and one in six women worldwide will suffer cancer throughout their lives, and one in eight men and one in eleven women will die of cancer (1).

Breast cancer is the second most common cancer in the world, and it is the cancer that causes the most death among women. According to Globocan 2018 data, when the distribution of breast cancer cases in the world is analyzed, Asia comes first with 43.6% followed by Europe with 25%. In mortality rates, Asia comes first with 49.6% and Europe is second with 22%.

Although breast cancer is common, it is a type of cancer that generally shows a slow development rate. When the diagnosis is made early, successful treatment results can be obtained and the mortality rate can be reduced. For this reason, experts in all regions of the world are working on breast cancer (2-8). Because knowing every information and the factors that may affect the treatment processes positively or negatively regarding the course of breast cancer can help develop strategies for both improving the quality of life of patients and reducing the cost of treatment.

Mortality decreased in some western countries due to early diagnosis of the disease and improvement of treatment methods (2,9), mortality is higher among developing countries due to low awareness and low level of early diagnosis (2, 10-12). The survival rate has been reported as 73% in developed countries and 53% in developing countries (2, 10, 11). "In 1993, the incidence of breast cancer was 24 per 100,000, and it increased to 50 per 100,000 in 2013; the number of new patients was 22,345 in Turkey in 2018" (13-15). Recently, the survival rate and prognostic factors of Iranian breast cancer patients were investigated (2).

In this study, the survival rates of breast cancer patients, which are very common in our geography, were investigated. For this purpose, Kaplan-Meier analysis was applied to the data obtained from breast cancer patients treated at Sivas Cumhuriyet University Medical Faculty Research and Application Hospital Oncology Center. Then 1, 5, 10 and 20 years survival rates were determined. Moreover, prognostic factors that affect the survival time of breast cancer patients were investigated using cox regression analysis.

Methods

In this retrospective study, data were obtained from 686 patients diagnosed with breast cancer in Sivas Cumhuriyet University Faculty of Medicine Research and Application Hospital Oncology Center between 1988 and 2014.

The survival analysis was used to analyze and interpret the data obtained until the occurrence of any event of interest.

The time elapsed between a certain starting time and death (failure) of a living organism or an inanimate object is called the "survival time" or "failure time" (16). The survival analysis estimates how long an individual with a particular illness will survive after a diagnosis of the disease or how long it will take the disease to recur (relapse) after beginning the treatment.

The main feature that distinguishes survival analyzes from other analyzes is that the stopped, that is, censored data is included in the analysis. When the event of interest in a study is the lifetime of an individual or a case, it is sometimes not possible for them to be kept under observation until the end of the study. Individuals or cases who come out of the observation for various reasons are called paused or censored observation.

In the survival analysis, nonparametric and semiparametric survival analyzes are used because the data structure is censored and the results obtained by parametric analysis methods may not be healthy.

The most well-known of these analyzes are:

- Life table analysis
- Kaplan - Meier Analysis
- Cox Regression Analysis

In these analysis methods, the results may differ as well as in the same direction.

The life table method can be used when the lifetime is grouped by intervals and the number of patients who die at each interval is measured (16). Main differences between the Kaplan-Meier method and the life table are that the follow-up period of the study is not divided into certain time intervals, that while the probability of death is calculated, the ones who left the study alive are

not included. Moreover, ıt can be studied with fewer observations in the Kaplan-Meier method (17).

Cox regression (18) model used to measure the effects of explanatory variables on survival time, is an extremely flexible regression model that does not require any assumptions about the structure of survival data. In the basis of the model, there is a logic that the risk rate or survival times are taken as a dependent variable and these vary depending on some factors. In Cox regression model, the effects of explanatory variables on the dependent variable are multiplicative. Refer to references (19,20) for more information.

Results

Incidents (death) occurred in 132 of the patients. The youngest patient's age was 18 and the oldest 89 yr. The mean age was 52 and the median 51 yr.

Statistical Analysis

As seen in Table 1, 1, 5, 10, and 20-year overall survival rate was 97%, 78%, 63%, and 49%, respectively.

Table 1: Overall life table of patients observed

Interval Start Time (Month)	*Number of Patients Observed*	*Censored Patients*	*Number of Risky Patients*	*Number of Patients Died*	*Termination Rate*	*Survival Rate*	*Cumulative Survival Rate*
0	686	1	685.5	20	0.03	0.97	0.97
12	665	65	632.5	19	0.03	0.97	0.94
24	581	91	535.5	24	0.04	0.96	0.90
36	466	91	420.5	15	0.04	0.96	0.87
48	360	68	326	16	0.05	0.95	0.82
60	276	50	251	13	0.05	0.95	0.78
72	213	57	184.5	2	0.01	0.99	0.77
84	154	41	133.5	9	0.07	0.93	0.72
96	104	22	93	5	0.05	0.95	0.68
108	77	16	69	4	0.06	0.94	0.64
120	57	8	53	1	0.02	0.98	0.63
132	48	17	39.5	1	0.03	0.97	0.61
144	30	7	26.5	1	0.04	0.96	0.59
156	22	5	19.5	0	0.0	1.00	0.59
168	17	3	15.5	0	0.0	1.00	0.59
180	14	3	12.5	1	0.08	0.92	0.54
192	10	1	9.5	1	0.11	0.89	0.49
204	8	1	7.5	0	0.0	1.00	0.49
216	7	2	6	0	0.0	1.00	0.49
228	5	1	4.5	0	0.0	1.00	0.49
240	4	1	3.5	0	0.0	1.00	0.49
252	3	1	2.5	0	0.0	1.00	0.49
264	2	0	2	0	0.0	1.00	0.49
276	2	0	2	0	0.0	1.00	0.49
288	2	1	1.5	0	0.0	1.00	0.49
300	1	0	1	0	0.0	1.00	0.49
312	1	1	0.5	0	0.0	1.00	0.49

The disease-free survival time is the total time between the first relapse and the primary treatment of the disease. As seen in (Table 2), 1, 5, 10, and 20-year disease-free survival rate of the patients are 99%, 94%, 91%, and 68%, respectively.

Table 2: Disease-free life table of the patients observed

Interval Start Time (Month)	*Number of Patients Observed*	*Censored Patients*	*Number of Risky Patients*	*Number of Patients Died*	*Termination Rate*	*Survival Rate*	*Cumulative Survival Rate*
0	686	70	651	9	0.01	0.99	0.99
12	607	76	569	7	0.01	0.99	0.97
24	524	103	472.5	6	0.01	0.99	0.96
36	415	94	368	5	0.01	0.99	0.95
48	316	77	277.5	3	0.01	0.99	0.94
60	236	52	210	0	0.0	1.00	0.94
72	184	56	156	1	0.01	0.99	0.93
84	127	42	106	1	0.01	0.99	0.92
96	84	20	74	0	0.0	1.00	0.92
108	64	18	55	1	0.02	0.98	0.91
120	45	7	41.5	0	0.0	1.00	0.91
132	38	16	30	1	0.03	0.97	0.88
144	21	7	17.5	0	0.0	1.00	0.88
156	14	4	12	1	0.08	0.92	0.80
168	9	2	8	0	0.0	1.00	0.80
180	7	1	6.5	1	0.15	0.85	0.68
192	5	0	5	0	0.0	1.00	0.68
204	5	1	4.5	0	0.0	1.00	0.68
216	4	1	3.5	0	0.0	1.00	0.68
228	3	0	3	0	0.0	1.00	0.68
240	3	1	2.5	0	0.0	1.00	0.68
252	2	0	2	0	0.0	1.00	0.68
264	2	0	2	0	0.0	1.00	0.68
276	2	0	2	0	0.0	1.00	0.68
288	2	1	1.5	0	0.0	1.00	0.68
300	1	0	1	1	1.00	0.0	0.0

Kaplan-Meier Analysis

By using Kaplan-Meier analysis, both overall survival and disease-free survival rates were examined.

Overall mean survival time (months) ± Standard Error (SE) [95% Confidence Interval (Cl)] was found as 208.4 months ± 11.8 months [185.3-231.4].

1, 5, 10, and 20-year overall survival rate was found as 96.6% ± 0.07%, 82.3% ± 1.7%, 64.4% ± 3.4%, and 49.5%± 7.4%, respectively. The overall survival curve is given in Fig. 1.

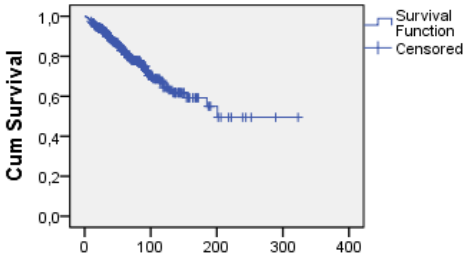

Fig. 1: Overall survival curve

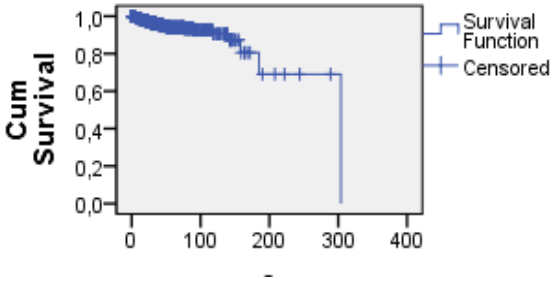

Fig. 2: Disease-free survival curve

The number of relapsed patients was 37. The number of censored data was 649 (94.6%). The mean disease-free survival time was found as 211 months ± 10.5 months [190.4-231.5]. 1, 5, 10, and 20-year disease-free survival rate was found as 98.6% ± 0.05%, 94% ± 1.1%, 90.6 ± 2.4%, and 69% ± 12.4%, respectively. The disease-free survival curve was given in Fig. 2.

With Kaplan-Meier analysis, factors affecting survival times were determined by looking at the results (P<0.05) of Log-rank tests for each variable.

Factors affecting overall survival time were found as disease stage, patient's age, C-erb B-2 status, LUMB, tumor grade, tumor diameter, LVI1, multicentricity, ECOG, CEA value, CA15-3 value, neutrophil / lymphocyte ratio, neutrophil/Plt rate. Average, standard error and 95% confidence intervals of survival times for these factors are given in Table 3.

Table 3: Averages of overall survival times by effective factors

Variable	*Mean*			
	Estimate	*Std. Error*	*95% Confidence Interval*	
			Lower Limit	Upper Limit
Stage I	176.860	9.382	158.471	195.249
Stage II	223.672	16.998	190.356	256.987
Stage III	138.996	10.342	118.726	159.266
Stage IV	41.417	8.140	25.463	57.371
Stage unknow	206.778	49.791	109.187	304.368
Stage insitu	133.923	8.721	116.830	151.016
Overall	208.356	11.757	185.313	231.400
Under 35	149.660	15.006	120.249	179.071
36-45	211.637	17.074	178.171	245.102
46-55	203.076	9.618	184.225	221.927
56-65	138.411	11.655	115.568	161.255
66-75	101.475	7.366	87.039	115.912
Over 75	73.898	8.316	57.597	90.198
Overall	208.356	11.757	185.313	231.400
CerB2 negative	169.838	11.026	148.227	191.449
CerB2 positive	187.267	22.020	144.108	230.425
Overall	197.721	16.766	164.860	230.583
LUMBA	225.554	21.897	182.636	268.473
LUMB (her2-)	165.981	8.757	148.818	183.144
LUMB (her2+)	99.464	5.284	89.107	109.821
her2+	132.020	15.612	101.421	162.619
trible(-)	148.061	10.332	127.811	168.312
Overall	202.750	16.274	170.852	234.648
Tumor Grade 1.00	172.009	18.804	135.153	208.865
Tumor Grade 2.00	188.845	15.288	158.880	218.810

Tumor Grade 3.00	123.164	7.710	108.051	138.276
Overall	190.368	11.689	167.458	213.278
Tumor size 1.00	154.593	15.565	124.086	185.100
Tumor size 2.00	197.384	15.153	167.683	227.084
Tumor size 3.00	127.677	19.385	89.683	165.671
Overall	197.096	11.554	174.451	219.742
ECOG .00	275.725	7.851	260.337	291.114
ECOG 1.00	168.804	15.755	137.925	199.684
ECOG 2.00	84.962	12.745	59.983	109.942
ECOG 3.00	37.926	9.102	20.086	55.766
Overall	208.356	11.757	185.313	231.400
CEA value 0-3	220.585	11.385	198.271	242.900
CEA value over 3	101.672	9.689	82.682	120.662
Overall	197.440	10.170	177.506	217.374
CA153 value under 30	226.947	11.144	205.105	248.788
CA153 value over 30	117.173	16.037	85.741	148.606
Overall	215.369	12.189	191.478	239.261
LVI1 yok	160.130	8.651	143.174	177.085
LVI1 var	140.654	14.030	113.156	168.153
Overall	156.895	9.845	137.598	176.191
No Multicentricity	175.593	9.270	157.425	193.762
Multicentricity	154.732	22.591	110.454	199.011
Overall	192.324	12.768	167.298	217.350
Neutrophil/lymphocyte under 3.5	204.733	10.608	183.941	225.524
Over 3.5	147.857	22.297	104.154	191.559
Overall	208.773	11.798	185.649	231.897
Neutrophil /Platelet Over 0.001	208.622	11.836	185.423	231.821
Under 0.001	106.333	18.284	70.496	142.171
Overall	208.773	11.798	185.649	231.897

Factors affecting the disease-free survival time were found as Ki-67 value, LUMB, grade, ECOG, diabetes, CEA value, CA15-3 value.Average, standard error and 95% confidence intervals of disease-free survival times for these factors are given in Table 4.

Table 4: Averages of disease-free survival times by effective factors

Variable	***Mean***			
	Estimate	Std. Error	95% Confidence Interval	
			Lower Limit	Upper Limit
Ki67 value under 28	130.125	5.408	119.524	140.725
Ki67 value over 28	217.639	17.905	182.546	252.732
Overall	209.989	13.443	183.640	236.338
LUMBA	299.721	3.787	292.300	307.143
LUMB (her2-)	149.938	6.305	137.581	162.295
LUMB (her2+)	114.436	3.712	107.161	121.710
her2+	173.443	7.060	159.606	187.281
trible(-)	166.057	6.760	152.808	179.306
Overall	248.878	24.061	201.719	296.037
Tumor Grade 1.00	230.649	7.151	216.634	244.665
Tumor Grade 2.00	211.244	31.566	149.374	273.114
Tumor Grade 3.00	149.211	6.153	137.151	161.271

Overall	226.711	24.924	177.860	275.563
ECOG .00	290.331	4.537	281.438	299.224
1.00	233.073	22.672	188.636	277.509
2.00	138.334	17.190	104.642	172.026
3.00	94.167	12.628	69.416	118.918
Overall	251.643	16.620	219.068	284.218
No diabetes	239.604	20.605	199.219	279.989
patient has diabetes	240.914	3.064	234.910	246.919
Overall	251.643	16.620	219.068	284.218
CEA value 0-3	269.932	6.656	256.887	282.977
CEA value over 3	206.306	31.213	145.129	267.482
Overall	256.410	16.833	223.417	289.403
CA 153 value under 30	269.582	6.896	256.066	283.098
CA 153 value over 30	206.306	31.213	145.129	267.482
Overall	256.152	16.857	223.112	289.192

Cox Regresyon Analysis

In this section, by applying Cox regression analysis, the effect of 23 independent variables was measured in the death (survival times) of breast cancer patients. The results of Cox regression analysis conducted to determine the variables affecting overall survival are seen in Table 5. Accordingly, the variables that have an effect on the overall survival time were found as the stage of the disease, multicentricity status, ECOG (performance status), presence of diabetes, CA15-3 value, and neutrophil/lymphocyte ratio.

The death risk of patients in stage 4 was 60.433 times more than patients in stage 1 (P=0.008). No significant difference was observed in the second and third stages. Those who had multicentricity carry 3.063 times more death risk than who did not (P=0.043). While there was no significant difference in ECOG (performance status) 0, 1, 2, there was a significant difference in ECOG 3. Patients with diabetes were 4.93 (4.93=1/, 203) times more at risk than those without diabetes (P=0.047). CA15-3 value was another variable that affects survival time (P=0.0). Neutrophil/lymphocyte ratio was also another significant variable (P=0.015). The increase in this rate increased the survival time.

The results of Cox regression analysis conducted to determine the variables affecting disease-free survival are seen in Table 6.

Table 5: Cox regression analysis results for overall survival

Variable	*β*	*Std Error*	*Wald*	*d.f.*	*p*	*Exp(β)*	*95% Confidence Interval*	
							Lower Limit	**Upper Limit**
Age	0.044	0.033	1.773	1	0.183	1.045	0.980	1.114
Menopause condition	1.418	0.879	2.604	1	0.107	4.129	0.738	23.108
ER	-0.010	1.342	0.0	1	0.994	0.990	0.071	13.738
PR	0.156	0.806	0.038	1	0.846	1.169	0.241	5.668
CerB2	-0.198	0.870	0.052	1	0.820	0.820	0.149	4.518
ki67	0.012	0.011	1.221	1	0.269	1.012	0.991	1.033

LUMB			2.807	4	0.591			
LUMB(1)	-0.130	1.794	0.005	1	0.942	0.878	0.026	29.567
LUMB(2)	-0.180	1.555	0.013	1	0.908	0.835	0.040	17.587
LUMB(3)	-1.172	1.792	0.428	1	0.513	0.310	0.009	10.376
LUMB(4)	0.575	1.005	0.327	1	0.568	1.776	0.248	12.733
Grade			3.497	2	0.174			
grade(1)	-1.430	0.786	3.316	1	0.069	0.239	0.051	1.115
grade(2)	-0.724	0.563	1.654	1	0.198	0.485	0.161	1.462
Tumor size	0.099	0.099	0.998	1	0.318	1.104	0.909	1.341
LVI1	-0.241	0.528	0.208	1	0.649	0.786	0.279	2.214
Surgical border			2.520	2	0.284			
Surgical border (1)	0.186	1.240	0.022	1	0.881	1.204	0.106	13.698
Surgical border (2)	1.387	0.882	2.474	1	0.116	4.003	0.711	22.551
multicentricity	1.120	0.554	4.086	1	0.043	3.063	1.035	9.071
ECOG			6.321	3	0.097			
ECOG(1)	-2.213	1.258	3.092	1	0.079	0.109	0.009	1.289
ECOG(2)	-1.573	1.188	1.753	1	0.185	0.207	0.020	2.129
ECOG(3)	-3.115	1.330	5.483	1	0.019	0.044	0.003	0.602
Comorbidity	1.717	1.026	2.799	1	0.094	5.567	0.745	41.599
Diabetes	-1.594	0.803	3.945	1	0.047	0.203	0.042	0.979
hypertension	-1.655	1.042	2.522	1	0.112	0.191	0.025	1.473
Family story	0.503	0.680	0.547	1	0.460	1.654	0.436	6.274
CEA	-.077	0.057	1.847	1	0.174	0.926	0.828	1.035
CA15-3	0.022	0.006	12.770	1	0.0	1.022	1.010	1.034
Neutrophil/lymphocyte	0.445	0.182	5.959	1	0.015	1.561	1.092	2.232
Neutrophil/Plt	-25.158	32.829	0.587	1	0.443	0.0	0.0	-
Stage			15.122	3	0.002			
stage (1)	0.480	1.325	0.131	1	0.717	1.616	0.120	21.707
stage (2)	1.034	1.286	0.646	1	0.421	2.812	0.226	34.972
stage (3)	4.102	1.552	6.988	1	0.008	60.433	2.888	1264.58
Histology			1.202	3	0.753			
histology(1)	0.134	0.700	0.036	1	0.849	1.143	0.290	4.509
histology(2)	1.095	1.503	0.531	1	0.466	2.991	0.157	56.904
histology(3)	-0.436	1.019	0.183	1	0.669	0.646	0.088	4.765

Table 6: Cox regression analysis for disease-free survival

Variable	*β*	*Std Error*	*Wald*	*d.f.*	*p*	*Exp(β)*	*95% Confidence Interval*	
							Lower Limit	**Upper Limit**
Stage			1.105	4[a]	0.894			
Stage (1)	0.437	107.970	0.0	1	0.997	1.549	0.0	1.241E+092
Stage (2)	4.367	107.705	0.002	1	0.968	78.844	0.0	3.761E+093
Stage (3)	5.079	107.711	0.002	1	0.962	160.665	0.0	7.760E+093
Stage (5)	12.967	109.516	0.014	1	0.906	427844.351	0.0	7.100E+098
Histology			2.652	3[a]	0.448			
histology(1)	-1.413	1.174	1.448	1	0.229	0.243	0.024	2.432
histology(2)	-0.277	2.370	0.014	1	0.907	0.758	0.007	78.897
histology(3)	-7.592	8.020	0.896	1	0.344	0.001	0.0	3386.424
Menopause	2.208	1.192	3.434	1	0.064	9.101	0.880	94.089

condition								
ER	-2.871	14.948	0.037	1	0.848	0.057	0.0	299715238063
PR	-1.323	2.059	0.413	1	0.520	0.266	0.005	15.051
CerB2	-0.291	1.197	0.059	1	0.808	0.747	0.072	7.805
LUMB			2.077	4	0.722			
LUMB(1)	-7.694	16.076	0.229	1	0.632	0.0	0.0	21984616206.4
LUMB(2)	-3.053	15.039	0.041	1	0.839	0.047	0.0	298489263376
LUMB(3)	-4.342	15.087	0.083	1	0.773	0.013	0.0	90458906001.1
LUMB(4)	1.234	1.527	0.653	1	0.419	3.435	0.172	68.510
Grade			6.177	2	0.046			
grade(1)	-0.466	1.252	0.138	1	0.710	0.628	0.054	7.296
grade(2)	-2.373	0.962	6.086	1	0.014	0.093	0.014	0.614
LVI1	1.229	1.013	1.472	1	0.225	3.419	0.469	24.916
Surgical border			0.351	2	0.839			
Surgical border (1)	-0.946	1.763	0.288	1	0.591	0.388	0.012	12.288
Surgical border (2)	-4.784	19.549	0.060	1	0.807	0.008	0.0	364717444650213.300
Multicentricity	-2.411	0.929	6.737	1	0.009	0.090	0.015	0.554
ECOG			11.328	3	0.010			
ECOG(1)	-5.365	2.021	7.046	1	0.008	0.005	0.0	0.246
ECOG(2)	-3.232	1.843	3.076	1	0.079	0.039	0.001	1.462
ECOG(3)	-2.291	2.130	1.157	1	0.282	0.101	0.002	6.582
Comorbidity	3.138	7.023	0.200	1	0.655	23.047	0.0	21900797.962
Diabetes	0.048	1.331	0.001	1	0.971	1.049	0.077	14.230
Hypertension	-4.370	7.016	0.388	1	0.533	0.013	0.0	11857.485
Family story	0.756	1.021	0.549	1	0.459	2.130	0.288	15.747

Accordingly, variables that had an effect on disease-free survival time were found as tumor grade, multicentricity, ECOG (performance status), and ECOG (1).

In addition, patients with tumor grade 3 were at 10.75 (1/0.093) times more risk than patients who were 1. Patients with multicentricity were at 11.11 (11.11=1/, 090) times more risk than non-multicentric patients. Patients with ECOG 4 were at 200 (200=1/0.005) times more risk than patients with ECOG 2.

Discussion

In this retrospective study conducted in the Oncology Center of Sivas Cumhuriyet University Faculty of Medicine Research and Application Hospital in Turkey, 1, 5, 10, and 20-year overall survival rate was found as 96.6% ± 0.07%, 82.3% ± 1.7%, 64.4% ± 3.4%, and 49.5%± 7.4%, respectively. Variables that affect the overall survival time were found as disease stage, multicentricity status, ECOG (performance status), presence of diabetes, CA15-3 value, neutrophil / lymphocyte ratio. Moreover, variables that affect the disease-free survival time were found as tumor grade, multicentricity, and ECOG.

In a similar study among women with breast cancer in Iran (2), the survival rate decreased as the patient follow-up time increased. In addition, a significant relationship was observed between survival time and variables such as age, tumor size, lymph node number, stage, histological grade, estrogen receptor, progesterone receptor, and lymphovascular invasion. 1, 5, 10, 15, 20 and 25-year overall survival rate was found as 95%, 75%, 60%, 47%, 46% and 46%, respectively.

Moreover, in a retrospective cohort study of inpatient breast cancer cases in Indonesia (8), important factors associated with survival rate were found to be metastasis and comorbidity.
In another study conducted in Egypt to determine the relationship between the survival time of women with breast cancer and sociodemographic and pathological factors (5), the median survival time was 83.8 ± 3.2. In addition, education level, bone metastasis, lung metastasis, tumor size and number of nodes were significantly correlated with survival.
It is understood from these studies conducted in different countries, at different times and using different variables, the stage of the disease, the tumor size, the presence of another disease, and metastasis variables can be said to be common prognostic factors that affect the survival of breast cancer patients.
Moreover, factors such as the level of awareness, screening programs, early diagnosis, access to treatment may lead to different survival rates according to countries.

Conclusion

The breast cancer was investigated, which is very common in our region. In addition, the prognostic factors were investigated affecting the survival rates and survival times of Turkish breast cancer patients. I hope that the findings from this study will not only contribute to the treatment processes of patients in this region, but will also contribute to the creation of general treatment strategies by comparing the results of similar studies conducted in different geographies of the world.

Ethical considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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Conflict of interest

The author declares that there is no conflict of interest.

References

1. The Global Cancer Observatory (2018). https://gco.iarc.fr/today/data/factsheets/cancers/20-Breast-fact-sheet.pdf
2. Meshkat M, Baghestani AR, Zayeri F, et al (2020). Survival Rate and Prognostic Factors among Iranian Breast Cancer Patients. *Iran J Public Health,* 49(2): 341-350.
3. Yoshida M, Shimizu C, Fukutomi T, et al (2011). Prognostic factors in young Japanese women with breast cancer: prognostic value of age at diagnosis. *Jpn j clin oncol,* 41(2): 180-9.
4. Shen Y, Yang Y, Inoue LY, et al (2005). Role of detection method in predicting breast cancer survival: analysis of randomized screening trials. *J Natl Cancer Inst*, 97(16): 1195-203.
5. Seedhom AE, Kamal NN (2011). Factors affecting survival of women diagnosed with breast cancer in El-Minia Governorate, Egypt. *Int J Prev Med,* 2(3): 131-8.
6. Zhang M, Chen H, Gu J (2016). Analysis of factors affecting endocrine therapy resistance in breast cancer. *Oncol Lett*, 11(1): 379-384.
7. Denkert C, von Minckwitz G, Darb-Esfahani S, et al (2018). Tumour-infiltrating lymphocytes and prognosis in different subtypes of breast cancer: a pooled analysis of 3771 patients treated with neoadjuvant therapy. *Lancet Oncol*, 19(1): 40-50.
8. Nadjib Bustan M, Aidid MK, Afrianty Gobel F (2018). Cox Proportional Hazard Survival Analysis to Inpatient Breast Cancer Cases. *Journal of Physics Conference Series*, 1028(1): 012230.
9. Rosai J (2011). *Rosai and Ackerman's surgical pathology e-book*. Elsevier Health Sciences.
10. The Global Cancer Observatory (2012). http://globocan.iarc.fr/old/FactSheets/cancers/breast-new.asp

11. Acil H, Cavdar I (2014). Comparison of quality of life of Turkish breast cancer patients receiving breast conserving surgery or modified radical mastectomy. *Asian Pac J Cancer Prev*, 15(13): 5377-81.
12. Rahimzadeh M, Pourhoseingholi MA, Kavehie B. (2016). Survival rates for breast cancer in Iranian patients: a meta-analysis. *Asian Pac J Cancer Prev*, 17(10): 4615–4621..
13. Çakmak GK, Emiroğlu S, Sezer A, et al (2020). Surgical Trends in Breast Cancer in Turkey: An Increase in Breast-Conserving Surgery. *JCO Glob Oncol*, 6: JGO.
14. Fidaner C, Eser SY, Parkin DM (2001). Incidence in Izmir in 1993–1994: first results from Izmir Cancer Registry. *Eur J Cancer*, 37(1): 83-92.
15. International Agency for Research on Cancer, World Health Organisation . Globocan Fact Sheets-Turkey. The Global Cancer Observatory; 2018. http://gco.iarc.fr/today/data/factsheets/populations/792-turkey-fact-sheets.pdf
16. Elandt-Johnson RC, Johnson NL (1980). *Survival models and data analysis* (Vol.110). John Wiley & Sons.
17. Machin D, Cheung YB, Parmar M (2006). *Survival analysis: a practical approach*. John Wiley & Sons.
18. Cox DR (1972). Regression models and life-tables. *Journal of the Royal Statistical Society: Series B (Methodological)*. 34(2): 187-202.
19. Hosmer Jr DW, Lemeshow S, May S (2011). *Applied survival analysis: regression modeling of time-to-eventdata*.https://www.wiley.com/en-gb/Applied+Survival+Analysis:+Regression+Modeling+of+Time+to+Event+Data,+2nd+Edition-p-9780471754992
20. Katz MH (1999). Multivariable Analysis: A Practical Guide for Clinicians. https://www.cambridge.org/core/books/multivariable-analysis/DBE7816A781AEF53108FD721199B4AC9