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Age- and gender-adjusted survival of patients with bladder cancer in the Samara region

Relevance: Bladder cancer accounts for 2.8% of all cancer cases in Russia. The age- and gender-adjusted survival of patients with bladder cancer is studied in Europe and the US and is also monitored in Russia. This data shall support the improvement of cancer care and individualization of treatment, as well as the assessment of the efficiency of conducted diagnostics and treatment. The survival data shall reveal the nuances of bladder cancer therapy and prevention.

Purpose of the study: To study the age- and gender-adjusted survival of patients with bladder cancer in the Samara region in 2010-2012, with the account of 5-year survival in 2017.

Results: About half of all patients had stage I cancer, about 30% – stage II. Morphological verification has revealed transitional cell carcinoma in 91.5% of cases. Nondifferentiated cancer was found in 47 patients (4.5%), adenocarcinoma – in 15 (1.4%) patients, squamous cell cancer – in 7 (0.7%) patients. About 91% of patients had highly differentiated tumors. Men suffered bladder cancer more often than women (4:1 ratio).

Conclusion: In the age group below 39 years, men had reliably higher survival than women. In the age groups of 40-49 years and 60-69 years, women had a statistically significant higher survival. In the age groups of 50-59, 70-79, and 80-89 years, no statistically significant difference in survival between men and women was revealed.

Keywords: age and gender group, bladder cancer, long-term survival.

Introduction: In Russia, bladder cancer accounts for 2.8% of all malignant neoplasms [1]. In 2017, the population of the Samara region amounted to 3 203 679 people, of them, 57.9% were of working age, and 26.1% of elderly and old age. Women predominated (54.3% of the total population).

Age- and gender-related survival of patients with malignant bladder tumors is studied by various researchers in Europe and the US [2, 3] and is actively monitored in Russia [4]. The survival data plays an essential role in improving the organization of cancer care, and the individualization of treatment methods; it allows evaluating the effectiveness of treatment and diagnostic measures and reveals the nuances in the treatment and prevention of bladder cancer. All this necessitates the age- and gender-related study of the patients with this pathology.

The aim of our work was to study the adjusted survival of patients with bladder cancer in various sex and age groups in the Samara region for 2010-2012, with a calculation of 5-year survival for 2017.

Materials and Methods: Adjusted survival in the Samara region was studied in 1,058 patients primarily diag-

nosed with bladder cancer. The study materials included the primary accounting documents from 2010 to 2012 (patient's information – the form 090y). The patients' information was verified by case histories and outpatient records of urological departments and oncological dispensaries of the region, the maps of advanced cases of bladder cancer, and the registration logs of urological and oncological departments of the region.

Besides, we used data on mortality obtained from Samara Region Statistical Office (Samarastat) from 2010 to 2017. The surviving patients whose data was missing were called for an interview. We also checked a database of patients registered for malignant tumors of the bladder, which contained the date and cause of death in case of death of the patient.

The actual method was used to calculate survival rates. Criterion Z was used to assess the reliability of the statistical differences in the obtained survival rates [5].

Results and Discussion: About half of the patients covered by the analysis had stage I disease, about 30% had stage II. The distribution of patients by age and disease staging is presented in table 1.

Stage	Below 39 years		40-49 years		50-59 years		60-69 years		70-79 years		80-89 years		Total	
	Abs.	%	Abs.	%	Abs.	%	Abs.	%	Abs.	%	Abs.	%	Abs.	%
I	20	1,9	26	2,4	129	12,2	151	14,3	161	15,2	39	3,7	526	49,7
II	1	0,1	15	1,4	66	6,2	91	8,6	107	10,1	31	2,9	311	29,3
III	1	0,1	4	0,5	17	1,6	34	3,2	32	3,0	15	1,4	103	9,8
IV	2	0,2	0	0	15	1,4	17	1,6	19	1,8	6	0,6	59	5,6
Без стадии	1	0,1	2	0,2	6	0,6	16	1,5	18	1,7	16	1,5	59	5,6
Всего	25	2,4	47	4,5	233	22,0	309	29,2	337	31,8	107	10,1	1058	100,0

According to morphological verification of the diagnosis, transitional cell carcinoma was most

common (n=968, 91.5%) followed by undifferentiated cancer (n=47, 4.5%), adenocarcinoma (n=15, 1.4%), and

squamous cancer (n=7, 0.7%). The remaining verified cases included anaplastic cancer, leiomyosarcoma, and cricoid cell carcinoma. About 91% of patients

had highly differentiated tumors. The distribution of patients by age and degree of differentiation is presented in Table 2.

Table 2 – Distribution of patients primarily diagnosed with bladder cancer in 2010-2012 by age and degree of differentiation

Degree of differentiation \ Age	Below 39 years		40-49 years		50-59 years		60-69 years		70-79 years		80-89 years		Total	
	Abs.	%	Abs.	%	Abs.	%	Abs.	%	Abs.	%	Abs.	%	Abs.	%
G1	20	1.9	44	4.2	218	20.5	280	26.4	311	29.3	90	8.4	963	90.7
G2	2	0.2	2	0.2	3	0.3	5	0.5	2	0.2	7	0.7	21	2.1
G3	1	0.1	0	0	5	0.5	7	0.7	8	0.8	6	0.6	27	2.7
G4	2	0.2	1	0.1	7	0.7	17	1.6	16	1.5	4	0.4	47	4.5
Total	25	2.4	47	4.5	233	22.0	309	29.2	337	31.8	107	10.1	1058	100.0

The study results showed an age-related increase in the share of patients with bladder cancer in both men

and women. Men had bladder cancer much more often than women (Table 3).

Table 3 – Distribution of patients primarily diagnosed with bladder cancer in 2010-2012 by age and gender

Пол \ Возраст	До 39 лет		40-49 лет		50-59 лет		60-69 лет		70-79 лет		80-89 лет		Всего	
	Абс. число	%	Абс. число	%	Абс. число	%	Абс. число	%	Абс. число	%	Абс. число	%	Абс. число	%
Мужчины	19	1,8	43	4,0	197	18,6	249	23,5	267	25,3	73	6,9	848	80,1
Женщины	6	0,6	4	0,4	36	3,4	60	5,7	70	6,6	34	3,2	210	19,9
Всего	25	2,4	47	4,4	233	22,0	309	29,2	337	31,9	107	10,1	1058	100,0

No statistically significant difference in survival rates between women and men was found in age groups of 50-59 years, 70-79 years, 80-89 years (p>0.05). The obtained data for the groups of below

39 years, 40-49 years, and 60-69 years was statistically significant (p<0.05). The adjusted survival of patients of various age and gender groups is presented in table 4.

Table 4 – Cumulative adjusted survival among the residents of Samara region who were primarily diagnosed with bladder cancer in 2010-2012 (the survival calculated as of 2017), % (P ± m)

Observation period (years)	Women	Men	Criterion Z
Below 39 years			
1	83.3 ± 0.0	94.7 ± 4.7	2.43 (p < 0.05)
2	83.3 ± 0.0	94.7 ± 5.3	2.15 (p < 0.05)
3	83.3 ± 0.0	94.7 ± 5.3	2.15 (p < 0.05)
4	83.3 ± 0.0	94.7 ± 5.3	2.15 (p < 0.05)
5	83.3 ± 0.0	94.7 ± 5.3	2.15 (p < 0.05)
40-49 years			
1	100.0 ± 4.1	83.5 ± 2.5	3.44 (p < 0.05)
2	100.0 ± 4.1	83.5 ± 3.1	3.21 (p < 0.05)
3	100.0 ± 4.1	78.8 ± 3.3	4.03 (p < 0.05)
4	100.0 ± 4.1	78.8 ± 3.4	3.98 (p < 0.05)
5	100.0 ± 4.1	78.8 ± 3.8	3.79 (p < 0.05)
50-59 years			
1	91.7 ± 2.8	89.3 ± 1.9	0.71 (p > 0.05)
2	86.1 ± 3.7	82.5 ± 2.3	0.83 (p > 0.05)
3	86.1 ± 3.7	79.9 ± 2.4	1.41 (p > 0.05)
4	83.3 ± 4.5	77.7 ± 2.5	1.09 (p > 0.05)
5	83.3 ± 4.5	77.2 ± 2.6	1.17 (p > 0.05)
60-69 years			
1	88.1 ± 3.2	77.8 ± 1.5	2.91 (p < 0.05)
2	86.4 ± 3.5	74.3 ± 1.7	3,11 (p < 0.05)
3	84.7 ± 3.7	69.5 ± 1.8	3.69 (p < 0.05)
4	82.9 ± 3.7	68.1 ± 1.9	3.56 (p < 0.05)
5	82.9 ± 4.2	64.8 ± 2.0	3.89 (p < 0.05)

Table 4 (continued)

Observation period (years)	Women	Men	Criterion Z
70-79 years			
1	78.1 ± 3.0	80.8 ± 1.6	0.79 (p> 0 , 05)
2	68.9 ± 3.5	69.4 ± 1.9	0.13 (p> 0 . 05)
3	67.3 ± 3.7	63.7 ± 2.0	0.86 (p> 0 , 05)
4	63.8 ± 4.0	61.8 ± 2.1	0.44 (p> 0 , 05)
5	63.8 ± 4.1	58.7 ± 2.2	1.10 (p> 0 , 05)
80-89 years			
1	66.2 ± 5.1	66.7 ± 3.9	0.08 (p> 0 , 05)
2	56.2 ± 6.8	56.4 ± 4.3	0.02 (p> 0 , 05)
3	49.4 ± 7.2	52.5 ± 4.4	0.37 (p> 0 , 05)
4	49.4 ± 8.5	48.0 ± 4.8	0.14 (p> 0 , 05)
5	49.4 ± 10.7	48.0 ± 5.2	0.12 (p> 0 , 05)

The data is presented in the form of diagrams for the ease of comparison of different age and gender groups (Diagram 1 and Diagram 2).

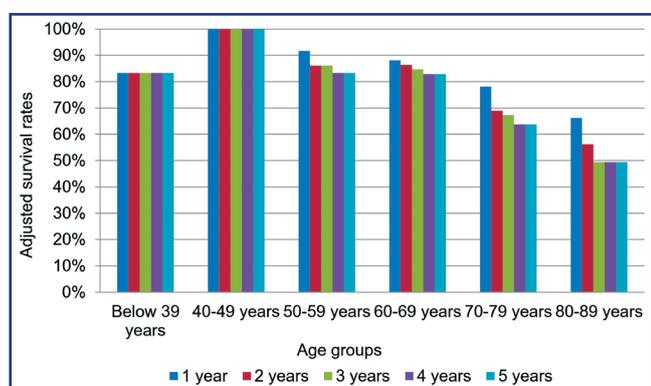


Diagram 1 – Cumulative adjusted survival among women of Samara region who were primarily diagnosed with bladder cancer in 2010-2012 (the survival calculated as of 2017), % (P ± m)

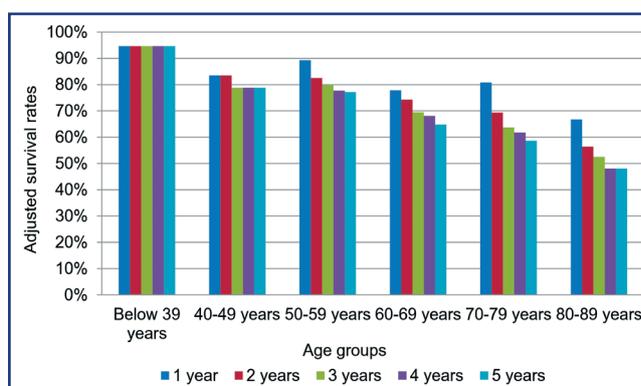


Diagram 2 – Cumulative adjusted survival among men of Samara region who were primarily diagnosed with bladder cancer in 2010-2012 (the survival calculated as of 2017), % (P ± m)

Conclusions. The study showed that about half of all patients had stage I disease; morphological verification revealed a more frequent presence of transitional cell carcinoma and a high degree of tumor differentiation. The detected age-related increase in the share of patients with bladder cancer regardless of gender has been well-known.

Our data shows that malignant lesion to the bladder is much more common in men than in women (4:1).

The statistical reliability of the data obtained in various gender and age groups was evaluated using the actual method and criterion Z. In the age group below 39 years, survival was significantly higher in men than in women vs. a higher survival in women at the age of 40-49 years and 60-69 years. No statistically significant difference in survival between women and men was revealed in the age groups of 50-59 years, 70-79 years, and 80-89 years.

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