

Epidemiological Features of Malignant Bone Neoplasms in the Republic of Uzbekistan

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Annotation: The article presents statistical data on the incidence and mortality from malignant neoplasms of skeletal bones in the Republic of Uzbekistan during the observation period from 2017 to 2021. In addition, the main cancer indicators of one-year mortality and 5-year survival were studied.

Research results showed that the highest morbidity rates were found among children aged 10-14 and 15-17 years, and among adults aged 18-44 years.

The mortality rate among children was higher than among adults.

In the Republic of Uzbekistan, there is a decrease in morbidity and mortality from malignant neoplasms of skeletal bones.

Keywords: morbidity, mortality, malignant bone neoplasms, men, women, annual mortality, 5-year survival, tumor stage.

Introduction.

Primary malignant skeletal bones have a mesenchymal origin and are of many different subtypes, accounting for 0.2% to 1% of all neoplasms in humans. The incidence of malignant bone neoplasms in Russia in 2020 for both sexes was 0.81 per 100,000 population (0.92 and 0.73 for men and women respectively). In the Republic of Uzbekistan, the prevalence of primary malignant bone tumors is 0.9 per 100,000 population. Osteosarcoma is the most common malignant primary bone tumor. Between the ages of 15 and 29, skeletal bone tumors account for 3% of all tumors, and osteosarcoma accounts for about half of these cases. Chondrosarcoma, the second most common malignant bone tumor, is, on the other hand, characteristic of elderly patients. The other most commonly encountered histological types of bone sarcomas include the Ewing sarcoma and the chordoma. Each of the listed histological types has its own characteristics of the course of the disease, prognosis and treatment tactics. The remaining histological types of bone sarcomas (for example, undifferentiated pelomorph bone sarcomas, angiosarcoma or adamantinoma) are significantly less common and often require individual treatment. Giant cell bone cancer (GCC) according to WHO 2020 is an unknown tumor.

Every year, about 10,000 new cases of malignant bone tumors are registered in Russia, which constitutes 1% of all malignant neoplasms. In 50% of observations, the primary malignant bone tumors are represented by osteogenic sarcomas [6], followed by Yuing's sarcomas. Other histological forms

are less common. Bone sarcomas are much more common in children and adolescents in their second decade of life, when their frequency is 3 per 100,000 population. Osteogenic sarcoma is present in 35-50% of all malignant bone tumors in children and adolescents. The incidence rate is 4 cases per 1,000,000 per year. In the initial examination, 20% of patients are diagnosed with a widespread form of the disease, and 22% progress at different stages of treatment [7].

Malignant bone tumors in children up to now -

one of the most dramatic pages of pediatric cancer, and this is primarily due to late diagnosis and a large number of patients seeking treatment in the late stages of the disease.[1] Osteogenic sarcoma is the most common malignant bone tumour (50-60%), followed by Yuting's sarcoma, followed by chondrosarcoma, fibrosarcoma, etc. Osteogenic sarcoma (OS) is the most common primary bone tumor in children and adolescents and is one of the most aggressively progressing human cancer diseases. This is due to the tendency of this tumor to early hematogenous dissemination with predominantly lung involvement. The first peak of morbidity occurs in prepubertal and pubertal age, the second peak occurs in the age group over 65 years old. Among all oncological diseases in children and adolescents, osteosarcoma ranks eighth and accounts for approximately 2.4-2.6% of all malignant neoplasms in children. The gender ratio (boys/girls) is 1.3-1.6:1. The overall incidence of OS is about 4 cases per 1 million children. As a rule, the tumor affects the long bones of the limbs (about 80% of all cases). The primary focus is most often localized in the femur (about 45% of cases), tibia (18-20%) and shoulder bones (10%). The remaining cases are rarely localized: skull bones (8%), pelvic bones (8%). Extra-ossal localization of the primary focus occurs casuistically rarely [2, 3].

Materials and methods. Our study used statistical data on cancer in the Republic of Uzbekistan to study morbidity and mortality rates in malignant neoplasms of skeletal bones. In addition, data on "The State of Oncological Care for the Population of the Republic of Uzbekistan in 2019-2021" were used. (under the editorship of Doctor of Medical Sciences, Professor M.N. Tillashaykhova and co-authors, 2022.) The annual statistical reports of the regional and city branches of the Republican Scientific and Practical Center for Statistics were studied using the SSV No. 7 form.

In our observations, in addition to the analysis of morbidity and mortality rates, the distribution of patients depending on age and gender was studied, as well as morbidity and mortality rates in the regions of the Republic and the main cancer indicators (professional examination, 1-year mortality, 5-year survival rate) in malignant skeletal bone tumors in the Republic of Uzbekistan.

A statistical analysis of malignant bone tumors in the Republic of Uzbekistan was conducted from 2017 to 2021. According to the Statistical Office of the Republic of Uzbekistan, in 2021, 25,578 patients were diagnosed with malignant neoplasms among the population for the first time in life. Every year, 350-400 patients with malignant skeletal neoplasms are registered in the Republic.

In 2021, 305 patients with malignant skeletal bone tumors were diagnosed in the Republic of Uzbekistan (2017 - 363 patients). In 2021, 2789 patients were registered in the dispensary of the Republic (2017 - 3192 patients).

The incidence of malignant neoplasms of skeletal bones per 100,000 population in the Republic was studied and the following data were identified. In 2017, the incidence rate was 1.1 per 100,000 population, and in 2021 it was 0.9 (a decrease in incidence rates is noted).

When the mortality rate is studied there is some decrease. If in 2017, the mortality rate per 100,000 population was -0.9, then in 2021 it was -0.5. A significant decrease in mortality rates is observed compared to morbidity rates ($p \leq 0.05$).

Analysis of the incidence of malignant skeletal neoplasms among the child population of the Republic showed that in 2017, 69 patients were identified, which constituted 19.0% of the total number of identified patients among the population and 81% of those diagnosed for the first time were over 18 years old. This indicator in 2021 was 67 (21.9%) patients, among the child population, the rest of the patients were over 18 years old (78.1%).

The number of diagnosed patients aged 0-4 years in 2017 was 5 (7.2%), including 2 (40.0%) boys and 3 (60.0%) girls. These indicators in 2021 were 9 (13.2%) patients, of whom 7 (77.8%) were boys and 2 (22.2%) were girls. Among children aged 5-9 years, 15 (21.7%) patients were identified in 2017, of whom 9 (60%) were boys and 6 (40%) were girls. In 2021, 12 (17.6%) patients were identified, of whom 6 (50%) were boys and 6 (50%) were girls. In 2017, 30 (43.5%) children aged 10-14 years were diagnosed, of whom 16 (53.3%) were boys and 14 (46.7%) were girls. In 2021, 30 (44.1%) patients were identified, of whom 17 (56.7%) were boys and 13 (43.3%) were girls. In 2017, 19 (27.5%) children aged 15-17 were diagnosed, of whom 13 (68.4%) were boys and 6 (31.6%) were girls. In 2021, 17 (25%) patients were identified, of whom 11 (64.7%) were boys and 6 (35.3%) were girls (Table 1).

Table 1. Dynamics of the incidence of malignant bone tumors in children in the Republic of Uzbekistan (2017-2021).

Years of Observation	Number of Patients (%)	Total Number of Detected Cases		0-4 years		5-9 years		10-14 years		15-17 years	
		Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
2017	69 (19.0%)	213	149	2	3	9	6	16	14	13	6
2018	80 (21.6%)	222	148	6	4	6	9	19	14	15	7
2019	68 (19.34%)	215	136	3	7	12	5	15	8	13	5
2020	73 (22.3%)	173	153	5	4	8	9	6	17	15	9
2021	67 (21.9%)	178	127	7	2	6	6	16	13	11	6

The presented data shows that malignant bone neoplasms among the child population are most commonly encountered in the age group of 10-14 years and in the age group of 15-17 years among boys. 73.9% of patients are 10-14 years old and 15-17 years old among children. In early childhood, the incidence rate for the reporting period did not exceed 12.7% compared to children with malignant bone tumors. The peak of morbidity was observed in the age group of 10-14 years and 15-17 years due to the high incidence of bone sarcomas.

Analysis of mortality from malignant bone neoplasms in children revealed that mortality among children in 2021 increased by 2 times compared to 2017 (in 2021 there were 45 patients and in 2017 there were 22 patients). Among the deceased patients, the highest indicator was recorded in the age period from 5 to 17 years, especially in the age range from 5 to 9 years (32 deceased patients, including 20 boys and 12 girls) and 10 to 14 years (69 deceased patients, including 39 boys and 30 girls). As can be seen from the presented data, the mortality rate among the population of the Republic from malignant neoplasms of skeletal bones was high in the age groups of 5-9 years and 10-14 years, especially among boys (Table 2).

Table 2. Dynamics of mortality from malignant bone tumors in children in the Republic of Uzbekistan (2017-2021).

Years of Observation	Number of deceased patient	0-4 years		5-9 years		10-14 years		15-17 years	
		Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
2017	22	0	1	4	3	4	3	5	2
2018	36	2	0	3	0	12	11	2	6
2019	21	0	1	2	1	9	2	4	2
2020	22	1	2	1	0	6	6	4	2
2021	45	0	1	10	8	8	8	4	6
Total	146	3	5	20	12	39	30	19	18

Analysis of the incidence of malignant skeletal neoplasms in the Republic of Uzbekistan among the adult population showed that in 2017, 293 patients were identified, of whom 173 (59%) were men and 120 (41%) were women. The disease was most frequently registered in the age group of 18-44 years - 76 (25.9%) and 48 (16.4%) of the male and female population, and in the age group of 45-64 years - 74 (25.3%) and 41 (14%) respectively. It was rare in the age group over 75 years old - 7 (2.4%) and 11 (3.8%) respectively.

In 2021, there was a slight decrease in the indicators and registered - 230 patients, 138 (60%) men and 92 (40%) women.

At the same time, the highest indicators were recorded in the age group of 18-44 years, among men - 73 (31.7%) and women - 40 (17.4%) respectively. In the age group of 45-64 years - 42 (18.3%) and 37 (16.1%) respectively. Rarely, 5 (2.2%) and 6 (2.6%) were found in the elderly over 75 years old, respectively (Table 3).

Table 3. The dynamics of adult population morbidity with malignant skeletal bone tumors in the Republic of Uzbekistan (2017-2021).

Years of Observation	Number of Patients	Total Number of Detected Cases		18-44 years		45-64 years		65-74 years		over 75 years	
		Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
2017	293	173	120	76	48	74	41	16	20	7	11
2018	290	176	114	80	46	68	45	16	15	12	8
2019	283	172	111	77	42	65	47	19	10	11	12
2020	253	139	114	59	50	57	47	20	12	3	5
2021	230	138	92	73	40	42	37	18	8	5	6

As can be seen from the presented data, malignant neoplasms are most often registered in different years in the age group of 18-44 years and 45-64 years compared to other age groups, especially among men. In the dynamics, there is a slight decrease in morbidity.

A study of mortality rates showed that in 2017, 263 patients with malignant skeletal neoplasms died, of whom 137 (52.1%) were men and 126 (47.9%) were women. Mortality was most frequently recorded in the 18-44 and 45-64 age periods, compared to other age periods.

This trend persisted in 2021. However, in 2021, a sharp decrease in mortality is observed in both 18-44 and 45-64 age groups, as well as in other age groups (Table 4).

Table 4. The dynamics of mortality among the adult population with malignant bone tumors in the Republic of Uzbekistan (2017-2021).

Years of Observation	Number of Patients	Number of deceased patients		18-44 years		45-64 years		65-74 years		over 75 years	
		Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
2017	263	137	126	48	38	55	52	19	16	15	20
2018	236	128	108	42	32	55	45	16	13	15	18
2019	186	116	70	35	12	49	34	16	14	16	10
2020	215	123	92	53	33	44	34	17	15	9	10
2021	199	120	79	48	24	48	31	15	19	9	5

However, mortality remains higher among men than among women. However, with age, mortality among women increased.

Analysis of the incidence of malignant neoplasms of skeletal bones in the regions of the Republic of Uzbekistan showed that the highest rates were recorded in 2019 in Jizzakh region - 1.8 per 100,000 population, Tashkent region - 1.8 and the Republic of Karakalpakstan - 2.3. This trend persisted until 2021 and the indicators were 2.19, 2.0 and 1.8 respectively. In other regions, the indicator was equal to the Republican indicator. Low indicators were recorded in Andijan - 0.7 and 0.7, Namangan - 0.5 and 0.9, and Kashkadarya - 0.9 and 1.0 per 100,000 population, respectively (Table 5).

Table 5. Dynamics of malignant bone tumors in the Republic of Uzbekistan (2021).

Regions	2019	2020	2021
Andijan	0.7	0.69	0.70
Bukhara	0.8	1.17	1.25
Jizzakh	1.8	2.09	2.19
Kashkadarya	0.9	0.85	1.0
Navoi	0.8	1.97	1.90
Namangan	0.5	0.88	0.90
Samarkand	0.9	0.72	0.80
Syrdarya	1.0	0.97	0.95
Surkhandarya	1.1	0.83	0.95
Tashkent Region	1.8	2.01	2.0
Tashkent City	1.1	1.4	1.5
Fergana	1.0	1.01	1.15
Khorezm	1.7	1.1	1.50
Republic of Karakalpakstan (RK)	2.3	1.29	1.80

Analysis of the detection of patients with malignant skeletal neoplasms in 2021 revealed that the detection of patients with stage I-II was 64.3%, stage III was 20.6%, and stage IV was 11.7%.

The detection of patients during preventive examinations in 2019 was -24.2%, in 2020 - 18.8% and in 2021 - 21.0%.

Analysis of one-year mortality in dynamics showed that the indicators decreased from 16% to 14.4% (2019-2021).

The 5-year survival rate decreased from 51.3% (2019) to 44.0% (2021).

Thus, the presented data on skeletal bone malignancies in the Republic of Uzbekistan show that morbidity and mortality, one-year mortality and 5-year survival rates are decreasing.

This requires comprehensive work to improve 5-year survival in this direction.

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