

## SHORT COMMUNICATION

**Epidemiology of testicular tumors in the Slovak Republic**

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**The authors present the results of a retrospective epidemiologic study on testicular cancer in the Slovak Republic (1993–2002). They analysed the epidemiological features (incidence, mortality, survival, etc.) together with the possible risk factors and diagnostic and therapeutic approaches.**

**Key words:** testicular tumors, cancer, epidemiological features.

Although testicular cancer is a relatively rare disease which accounts approximately for 1 % of all male malignancies, it is the most frequently diagnosed malignant tumor among men aged 20–34. During the last two-three decades a worldwide increase of its incidence has been observed. This trend has been classified as an epidemic in some countries.

The highest testis cancer rate is concentrated in several Western European countries but mainly in countries of North Europe, further in Australia, New Zealand, and in countries of North and South America with moderate climate. Moderate incidence was found in Southeastern Europe and in Latin America, the lowest incidence in all regions of Africa and Asia except of Japan.

The main characteristic of testicular cancer epidemiology in developed countries is stabilisation or decrease of its mortality, despite of the increase of incidence. The highest decrease of mortality in the 70-s was found in Western European countries, however, in countries of Middle and Eastern Europe was this trend observed a decade later the later availability of modern treatment methods.

The database of our epidemiological study consists of 1811 patients from the Slovak Republic with testicular cancer diagnosed in 1993–2002. Patients' data were obtained from medical records, histological findings and questionnaires, which were correlated with the results of the National Cancer Registry of the Slovak Republic.

In the Slovak Republic, there has been observed a four-time increase of testicular cancer incidence in last three decades as well as in other developed European countries. Occurrence increased from 1.5/100 000 in 1968 to 7.8/100 000 males in 2002. A stabilisation of its mortality (from 0.6/100 000 in 1968 to 0.5/100 000 in 2002) has also been observed.

The highest incidence of this malignancy was registered in some districts of Western, but mainly Northern and Southeastern Slovakia, as well as in both biggest cities. Geographical distribution of mortality correlates with the incidence distribution only partially. This fact can be explained by not using the specialized medical centres, which are able to provide an early diagnose and adequate therapy in some districts of the Slovakia. The 1st increase of age-specific testicular cancer incidence is observed in the group of 0–4 years old males, the 2nd and the most important increase in the adolescent age and immediately after it. This typical age-specific curve is observed in all race/ethnic groups of population. After the age of 50, there has been observed a moderate decline of the disease incidence, followed by the 3rd increase in the oldest age groups. These differences are caused by the typical occurrence of particular histological types of testicular tumors. The highest peak of incidence in males 30 is caused mainly by nonseminomas, in the 4th decade usually by pure seminomas. Moderate increase of incidence in the oldest group is caused mainly by the non-germ-cell testicular tumors, especially lymphomas. The highest incidence of the disease in our study was in the age group of 30–34 years. However, a statistically significant drift to the

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The study was supported by the grant VEGA Ministry of Education of Slovak Republic and Slovak Academy of Sciences 1/9326/02.

lower age groups has been observed in the last 3 decades. Age-specific curve of mortality does not correlate with the trends of incidence. The mean age of patients with bilateral disease at the time of the 1st tumor diagnosis was 27.5 years, while in the age group of 25–29 years 36 % of all the patients were diagnosed. The mean age at the time of the 2nd diagnosis was 32 years, in the age group of 30–34 years 25 % of all the patients were diagnosed.

The important indicator of the quality of a diagnostics, therapeutic and overall management of oncological patients is the length of their survival after treatment. Slovak 1-year survival of testicular patients is about 90 %, 5-year survival is 84 % and these data assigned the Slovak Republic to the countries of Eastern and Middle Europe with relatively short survival. However, it is important to say, that only 6 countries – Slovakia included – provided the real and national data of mortality. When evaluating the survival-rate, some countries provided only regional mortality data, which covered 20 % or less of the whole population.

In our study, 90 % occurrence of germ-cell testicular tumors has been observed. Seminoma was most frequent, it occurred in almost 40 %. As a component of mixed germ-cell tumors, it participated in another 13 %. All other histological types represented the similar percentage of occurrence, as was previously described. When evaluating the risk factors, we divided them to the objective and subjective, depending on its record in medical histories. The

most frequent risk factor was inguinal hernia (9.5 %). The occurrence of trauma testis (9.2 %) can be influenced by the recall bias. Eight patients (19.3 %) from the group with bilateral disease had synchronous tumor. Other patients had subsequent occurrence of tumor in the solitary testicle. The mean time to the manifestation of tumor in solitary testicle was 60 months (range 8–302 months). We did not observe a statistically significant difference between the time interval to the manifestation of the second tumor when comparing seminomas and nonseminomatous testicular tumors.

Reasons for the therapeutic delay are following: the mean-time of the delay caused by patient was 35 days (range 0–3267 days), the delay caused by physician was 1 day (range 0–90 days), the delay caused by the specialist (who did not diagnose the disease correctly) was 5 days (range 0–2980 days). Overall therapeutic delay was 62 days (range 0–5077 days).

We can conclude, that mortality of testicular cancer in the Slovak Republic has been decreasing despite of the increasing incidence in unilateral, as well as bilateral tumors. In the Slovak Republic, we described a statistically significant high occurrence of cryptorchidism and inguinal hernia as risk factors when comparing the group of patients with unilateral and bilateral tumors. On the other hand, the trauma of testis was not statistically significant. The highest survival rates has been observed in the group of males younger than 30 years, mainly with seminomas.

Received May 25, 2005.

Accepted May 30, 2005.