Cancer Mortality, Recent Trends and Perspectives

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ABSTRACT

Considering that a register for cancer was established in Federation of Bosnia and Herzegovina only recently, basic reliable source for the analysis of cancer mortality trends are the data on death cases caused by such diseases. Lack of census as well as standardized mortality rate data makes the study even more difficult to make. The aim of the study is the analysis of the malign diseases trend in the post-war period according to the available data. The study is the descriptive work on the analysis of the system using linear regression methods for expected trend for the total population and age group from 0 to 64 years. Registered rate of cancer mortality in Federation of Bosnia and Herzegovina in 2004 was 142 per 100,000 inhabitants, and indicates input stream in the analyzed period. Total increase in mortality of males and females is 2.5% per year. It is expected that in 2020 around 30,000 inhabitants of Federation of Bosnia and Herzegovina will die of some malign disease. Trend of mortality of malign diseases in males is higher than in females and more probable in older population. There is a tendency of mortality decrease in the group of 0-64 years of age. Mortality list of the most frequent locations of cancer has undergone changes. Liver cancer, colon cancer, sigma and rectum cancer as well as lung and breast cancer lead the list. Objective ageing of the population, technological drawbacks, insufficient primary and secondary prevention worsened by socio-economic life conditions will affect the increase in number of people with malign diseases in Bosnia and Herzegovina.

KEY WORDS: cancer, mortality, trend
INTRODUCTION

In certain European countries differences exist in morta-
tality of malign diseases. Trend of mortality of cancer
(for the most frequent cases), that was increasing in Eu-
rope since 1990, starts to drop slightly (1). In the coun-
tries of Eastern and Central Europe number of males
who died of lung cancer increased by 10% after 1990.
Simultaneously, number of females who died of breast
cancer increased by 10% and those who died of cervix
cancer by 20%. Existence of potential causes of cancer,
such as smoking, alcohol, eating habits, pollution of en-
vIRONMENT along with inadequate screening, diagnosis
and treatment affects locations of the most frequent tu-
mors and their trend (2). Most of EU countries have reg-
isters for cancer and standardized population on the ba-
sis of which they obtain reliable data on mortality trend
for quite a long period of time (3). However, the number
of the deceased in the register for cancer is frequently
lower than the number stated in the official statistics.
The explanations may lie in the incomplete registration
of the diagnosed cases (respect of patients’ rights), lack
of linkage of the health system (residence certificate,
treatment certificate) and insufficient data provided by
health institutions. In Bosnia and Herzegovina, trends
level of malign diseases should be the only reliable indi-
ces of mortality of these diseases. Last census was carried
out in 1991, migration process is not completed. Regis-
ter for cancer has just been established and includes
the data at entity level (not the state level). Mortality
data have just recently been processed at the state level.

OBJECTIVE

The aim of the study is the analysis of the trend of ma-
lign diseases in the post-war period according to the
available data.

MATERIAL AND METHODS

Descriptive study of the system analysis was done using
linear regression for the expected trend for total popula-
tion and age group from 0-64 years. The study encom-
passes the period from 1999-2004. Trend level was ob-
erved with respect to the total mortality, according to
sex, age, location of the disease. Data source are frequen-
cies of the deceased in the six-year period in Federation
of Bosnia and Herzegovina (Institute of Statistics FB&H).

RESULTS

Cancer caused mortality rate (non-standardized) was
slightly increasing by 2.5% per year, whereas for the age
group of 0-64 years that increase was 0.5%. Percentage
of the deceased in the age group 0-64 years compared
to the total number of the deceased decreased from 49.1
to 40.5% (Table 1). Standardized rate of general mortal-
ity for 2004 was 140.14 per 100,000 inhabitants and is
lower than the non-standardized one (142.12/100,000).
General mortality rate for males in 2003 was 173.7 and
for females 109.9. In the period 1998-2004, in the group
of males of age 0-64 years, mortality rate ranged be-
 tween 77.3 and 86, and in the group of females between

<table>
<thead>
<tr>
<th>1999</th>
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<td>1374</td>
<td>1348</td>
<td>1381</td>
<td>1383</td>
<td>1339</td>
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</table>

| 63.35 | 67.15 | 68.65 | 67.07 | 67.02 | 65.04 |

| 49.1  | 46.3  | 44.3  | 43.4  | 42.5  | 40.5  |

TABLE 1. Malign diseases caused mortality rate in Federation of Bosnia and Herzegovina according to the year

<table>
<thead>
<tr>
<th>1999</th>
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<td>766</td>
<td>823</td>
<td>862</td>
<td>811</td>
<td>809</td>
<td>849</td>
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</tbody>
</table>

| 77.3  | 83.1  | 87    | 81.9  | 81.9  | 86.0  |

| 537   | 551   | 486   | 570   | 574   | 443   |

| 50.3  | 51.6  | 45.5  | 53.3  | 53.6  | 41.3  |

| 58.8  | 59.9  | 63.9  | 58.7  | 58.5  | 63.4  |

| 41.2  | 40.1  | 36.1  | 41.3  | 41.5  | 36.6  |

TABLE 2. Malign diseases caused mortality rate in Federation of Bosnia and Herzegovina according to sex and age
Percent of males in the total number of the deceased was increasing, while the number of females was decreasing, which matches the number of the deceased in this age group (Table 2 and Chart 1). Mortality rate of the deceased males of all ages was increasing, and slightly less increasing for age group 0-64 years (Chart 2). Mortality rate of the deceased females of all ages was slightly increasing compared to males 0-64 years of age and it has a decreasing tendency (Chart 3). The most frequent locations of malignant diseases were lung, tracheae and bronchi (for males), breast (for females), colon, sigma and rectum, liver and intra-hepatic tract, pancreas and brain (Table 3). The frequencies of the diseases’ occurrence changed, so the colon-rectal

<table>
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<tr>
<th>LOCATION</th>
<th>1999</th>
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<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>lung</td>
<td>31.3</td>
<td>36.3</td>
<td>36.7</td>
<td>37.2</td>
<td>37.0</td>
<td>36.1</td>
</tr>
<tr>
<td>breast</td>
<td>14.0</td>
<td>12.3</td>
<td>13.1</td>
<td>14.6</td>
<td>15.4</td>
<td>14.2</td>
</tr>
<tr>
<td>colon, sigma, rectum</td>
<td>10.7</td>
<td>10.7</td>
<td>9.3</td>
<td>-</td>
<td>13.3</td>
<td>12.8</td>
</tr>
<tr>
<td>liver and intra-hepatic tract</td>
<td>10.7</td>
<td>11.8</td>
<td>12.0</td>
<td>11.1</td>
<td>11.9</td>
<td>12.8</td>
</tr>
<tr>
<td>pancreas</td>
<td>5.9</td>
<td>5.5</td>
<td>5.5</td>
<td>6.9</td>
<td>7.1</td>
<td>6.9</td>
</tr>
<tr>
<td>brain</td>
<td>5.5</td>
<td>5.3</td>
<td>6.1</td>
<td>6.6</td>
<td>6.1</td>
<td>6.7</td>
</tr>
</tbody>
</table>

**TABLE 3.** Mortality rates of the most frequent locations of the malign diseases
cancer and liver cancer replaced stomach cancer as the most frequent ones. Mortality of breast cancer in females was constantly increasing with the exception of females in age group between 0-64 year (Chart 4). Lung cancer was the most frequent type of cancer in males. Mortality of this type of cancer in males of all age groups was constantly increasing. The fact that the mortality rate was decreasing for the age group of 0-64 years casts light on the situation as such (Chart 5). Lung cancer mortality in females of all age groups was increasing more slightly when compared to males. However, mortality in the age group 0-64 years of females was stagnating and was not decreasing at the same pace as in males group (Chart 6). Just like in East European countries, an increase in female mortality caused by cervix cancer exists in Bosnia and Herzegovina. It was increasing for females of all age groups, including age group 0-64 (Chart 7).

**DISCUSSION**

In Federation of Bosnia and Herzegovina in 2004, 20% of all mortality causes were due to cancer, which is below Slovenian (26%) and European average (28%). According to World Health Organization, general mortality in Europe amounts to 140/100000 and is considerably higher in the transition countries (Hungary-203/100000). In Federation of Bosnia and Herzegovina, general mortality rate concurs with European average. Since 1995, malign diseases caused mortality rate in young population has started to decline worldwide. In Federation of Bosnia and Herzegovina, in the post-war period, mortality rate of population below 65 has decreased, in females in particular, which is explained by the improvement of diagnostics and treatment. Analysis of mortality caused by cancer in Europe shows 10% decrease in the case of lung cancer, intestinal and urinary bladder (4). Number of intestinal and uterus cancer in females has decreased by around 20%. Number of stomach cancer decreased by 30% and leukemia by 10% (in both males and females). Mortality trend of ovarian and prostate cancer is constant. The most considerable changes in terms of trend increase were recorded in the case of lung cancer in females in the Central and Eastern Europe (5). The most striking is the trend of increase of colon-rectum cancer in the transition countries, including Bosnia and Herzegovina, in both males and females, which is associated with unhealthy life style (bad eating habits, obesity and lack of physical activity). In Slovenia, an increase in colon cancer caused death was observed in males. Mortality of this cancer type is above European average. Similar situation was recorded in the countries of Eastern and Central Europe. It is interesting to note that in the concerned countries, colon cancer caused mortality was below European average in early 1980’s while, in late 1990’s, it was above European average (6). Like in most other European countries, in Federation of Bosnia and Herzegovina the most frequent cancer types were lung cancer in males, and breast cancer in females. In countries where the number of male smokers has dropped, the number of cases of lung cancer was reduced (7). Simultaneously, the number of females with lung cancer has increased. Similar situation is in Federation of Bosnia and Herzegovina - trend of mortality of lung cancer in males up to 64 years old has significantly decreased, and is stagnating in the case of females. Breast cancer caused mortality rate increase can be explained by higher frequency of this disease in elderly age whereas decreasing trend was recorded in female age group of 65 years (8). In prognosis of the future trends of cancer mortality, change in number of population and ageing of population will have significant role, because malign disease caused mortality rate is highest with elderly population. It is assumed that, up to 2015 in 25 European countries with current population of 450 million, the population
size will decrease by 2 million i.e. by 0.5%. Simultaneously, the number of elderly people of 65 years of age will increase – they will constitute 20% of the total population. General diseases caused mortality trend will mostly depend on rates of mortality caused by lung and breast cancer (9). Total number of the deceased of cancer in 25 European countries was 1.1 million in 2000. Based on 2000 data, it is envisaged that in 2015, number of the deceased will increase up to 1.4 million i.e. there will be 280 000 death cases (25%). Increase will be more prominent in males than in females (10). It is envisaged that in 2015, EU countries with the highest number of malignant disease mortality cases will be France, Germany, Holland and Spain, and with the lowest number will be Italy and Great Britain (11). Amongst other European countries, Poland will sustain considerable mortality increase. In Federation of Bosnia and Herzegovina, mortality increase of total population and population over 65 years of age is envisaged, as well as in other European countries. Ageing of population will affect it. According to estimations made in 2004, individuals older than 65 constituted 14.1% of the population in Federation of Bosnia and Herzegovina (12). Primary and secondary prevention will have important role in reduction of mortality caused by malignant diseases (13). Promotion of healthy life styles is the national priority in reduction of mortality, especially caused by lung cancer and colon-rectal cancer. Secondary prevention implies screening for cervix, breast, colon-rectal and prostate cancers (14). Preventive examinations for the purpose of early detection of cancer should be the responsibility of general practitioners and gynecologists (15). Diagnosis and treatment of the malignant diseases should be covered by health insurance.

CONCLUSION

- Important factors for the estimation of trends are census and data from the cancer register. Last census in Bosnia and Herzegovina was carried out in 1991, and cancer register is in its inception phase at entity level.
- Standardized rate of cancer mortality for 2004 in Federation of Bosnia and Herzegovina concurs with the European average rate.
- It is expected that mortality will decrease in the population below 65 years of age, which is an encouragement.
- The most frequent cancer types are lung cancer in males and breast cancer in females. Mortality list of cancers is similar to the European one.
- Estimation of mortality trend of malignant diseases in Federation of Bosnia and Herzegovina will be improved once the data from the cancer register are available.

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