I. Streszczenie w języku angielski

Introduction

Compared to other European countries, Poland is characterized by an average risk of morbidity and a high risk of death due to cancers. The growing number of cancer cases and deaths in Poland is strongly related to demographic changes and high exposure to risk factors. The high degree of industrialization as well as a greater access to processed food and stimulants negatively affect the pro-health behavior of the population. An additional factor worsening the health situation of the Polish population is the lack of effective health programs in the field of primary and secondary prevention.

Gastrointestinal cancers account for almost 20% of all new cancer cases in Poland. Knowledge of risk factors that may affect the development of cancer makes it possible to carry out preventive measures. Accurate identification of the population that is at high risk of gastrointestinal cancer and to which preventive measures should be directed is a priority in the fight against cancer. Conducting epidemiological research significantly supports the identification of groups most at risk of cancer, enabling the detection of the disease at its early stage.

Objective

The aim of the study was to assess the burden of selected gastrointestinal malignancies (colorectal cancer, gastric cancer, pancreatic cancer) in Poland in the years 1999-2017 and to identify groups most at risk of developing and dying from gastrointestinal malignancies.

Material and methods

The analysis was based on information published by the National Cancer Registry on the number of cases and deaths due to gastrointestinal malignancies in Poland in 1999-2017 (C16, C18-C20, C25). The collected data were analyzed separately in the group of men and women, in the following age groups: 20-34; 35-49; 50-64; 65-79; 80+.

The obtained data were used to calculate epidemiological measures, i.e. crude morbidity and mortality rates as well as standardized rates. The standardization was performed by adopting the population of Europe as the standard, thus allowing to level out the influence of the age difference of the population on the value of raw coefficients. In order to show disproportions in relation to gender, the Rate Ratio (RR) was used, which is a quotient of two index values showing the health status in the compared population groups. The analysis also estimated the standard errors (SE) of the applied morbidity and mortality rates and the 95% confidence interval (CI) to determine statistical significance.

Changes in the time trends of morbidity and mortality rates were estimated using joinpoint models. This method is an extension of linear regression, in which the time trend is expressed by segments connected with each other at points (joinpoint), where the trend changes its direction in a statistically significant way ($p<0.05$).

Based on the linear regression model, the annual percentage change in the coefficient values for each of the determined trends (APC) was calculated. A 95% confidence interval was also established to determine the statistical significance of the APC. Trend analyzes and APC values were calculated using the Joinpoint Regression Program (Version 4.9.0.1).

Results

In 2017, there were almost 165,000 new cases of cancer in Poland. The total number of cases was 47% higher in comparison to 1999. Among these cases, about 20% were gastrointestinal cancers - colorectal, gastric and pancreatic were the most frequent of them.

In 2017, 18,000 inhabitants of Poland fell ill with colorectal cancer, 55% of these cases concerned men. A high increase in the incidence was noted in people over the age of 50. In men, incidence trends measured by the standardized ratio (ASR) showed the greatest increase in the 65-79 age group (AAPC=2.0%, $p<0.05$). In women, the greatest changes in the ASR value were noted in the younger population - 20-34 years (AAPC=1.5%, $p<0.05$). The direction of the incidence trend among both values during the study period was similar. An extended analysis of the incidence for the 35-49 age group showed an increase of 30% in men aged 35-39 and a 39% increase in women ($p<0.05$).

In the period covered by the study, death due to colorectal cancer turned out to be the most burdened for the population aged 65-79 in both sexes. However, the analysis of the standardized mortality trend for this age group showed that the growth rate was faster in men (ASR=23.5/100,000). An extended analysis across the five-year age groups from 35 to 49 years showed a greater number of deaths among men in each analyzed five-year age group. In men aged 44-49, the specific mortality rate was higher in 2017 by 14% compared to 1999.

In 2017, there was an 11% reduction in gastric cancer cases. The study showed that men were sick more often than women. The diagnosis was most often made in the age group of 65-79 years. The largest percentage change in 2017 compared to 1999 was recorded in women aged 35-49, the number of cases decreased by 32.3% (AAPC=-1.9%, $p<0.05$). The standardized incidence rate was higher in men. The time trend of ASR for the age group of 80 years and older in both sexes increased at the end of the study ($p<0.05$).

The number of deaths due to gastric cancer in 2017 decreased in both sexes compared to 1999. The largest percentage change in the number of deaths was recorded in men aged 35-

49 - the crude number of deaths decreased by almost 58%. In the group aged 80 and more, the number of deaths increased by 51% in men and by 20% in women. In the age group of 20-34, women experienced the greatest decrease in the value of the coefficient among all age groups (by 61%, AAPC=-1.4%).

In the period covered by the study, there was an increase in new cases of pancreatic cancer in Poland of 8% and an increase of almost 22% in women ($p<0.05$). The study showed change in the structure of cases. After the age of 65, women accounted for a higher percentage of cases, while men below this age predominated. The value of the standardized incidence rate of pancreatic cancer reached the highest value in women aged 80 and more ($p<0.05$).

The number of deaths in 2017 was higher compared to 1999, especially in the 65-79 age group of both sexes. In 2017, 2,455 deaths were recorded in women, which was a 40% increase from 1999 ($p<0.05$),while men showed a 35% increase and the number of deaths was 2,409. The study also showed an increase in the value of the standardized mortality rate for women aged 65-79 - ASR was 39.22/100,000. In men aged 65-79, the standardized mortality rate was 55.85/100,000. ($p<0.05$).

Conclusions

The conducted study allowed the formulation of the following conclusions:

1. In Poland, there is a steady increase in morbidity and deaths due to colorectal and pancreatic cancer.

2. In the Polish population, the structure of colorectal, gastric and pancreatic malignant neoplasms changed in the period under study. Thus, the health needs of the population have changed.

3. There is a need to introduce effective preventive programs in Poland that would change the trend of morbidity and mortality due to malignant tumors of the gastrointestinal tract.

4. Due to the need to monitor changes in the health situation of the population, there is a need to improve the completeness and quality of clinical data collected by the National Cancer Registry. The results of analyzes conducted on the basis of these data should be the basis for taking rational actions in the field of health policy.