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Incidence of colorectal cancer in Lower Silesia (Poland) between 1984 and 2003 – trends and perspectives

Research article

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Abstract: The purpose of the present study was to demonstrate the epidemiological characteristics of colorectal cancers (CRCs) diagnosed in Lower Silesia between 1984 and 2003. Data from the Lower Silesian Cancer Registry on the incidence of CRC in the Lower Silesian province were subjected to analysis. The age adjusted incidence of CRC in both genders increased markedly. A higher relative increase of incidence was recorded for colon cancer. The age-specific incidence of either colon or rectal cancer increased markedly with age in both genders. No constant time-trend toward the earlier diagnosis of CRC was noted in the period studied. Although the number of CRC surgeries performed at the Regional Comprehensive Cancer Center in Wroclaw has increased over time, most of the cases that were diagnosed were treated outside that reference center. If an intensive increase in new case numbers, demonstrated in both the locations by 2003, is not moderated, the incidence of colorectal malignancies in Lower Silesia would become one of the highest in Europe.

Keywords: *Colorectal cancer • Age-specific incidence • Lower Silesia • Epidemiology • Relative survival*

1. Introduction

Colorectal cancer (CRC) is one of the major health problems in the developed countries, and it is the second most common cause of cancer death [1].

Although in comparison to other European countries, Polish citizens face a relatively low risk of CRC, an analysis of population registries reveals a constant increase in both incidence and mortality of that group of malignancies. Despite patient gender, colorectal malignancies are either the second location of cancer or the second reason of cancer-related deaths in Poland. Whereas 6,339 deaths related to CRC were recorded in Poland in 1990, their number increased to 9,042 in 2002 [2].

Moreover, the incidence of cancers varies among the administrative regions of Poland and a higher incidence has been for years reported in southwestern regions, including the Lower Silesian province [3]. Consequently, the purpose of the present study was to demonstrate the epidemiological characteristics of colon and rectal cancers diagnosed in Lower Silesia between 1984 and 2003.

2. Material and Methods

Data from the Lower Silesian Cancer Registry, C18-C20 according to ICD-10 [4], on colon (C18), sigmorectal flexure (C19) and rectal (C20) cancer incidence in the Lower Silesian province, were subjected to analysis. For the purpose of the study, tumors with C19-C20 location were considered together as rectal cancer.

The Lower Silesian province was determined in 1999 as the result of territorial realignment in Poland, joining the former Wrocław, Wałbrzych, Legnica and Jelenia Góra provinces and Góra county. The newly aligned province consists of 26 counties and three cities with county rights (Figure 1) and has 2,893,055 inhabitants, including 1,503,734 women [3].

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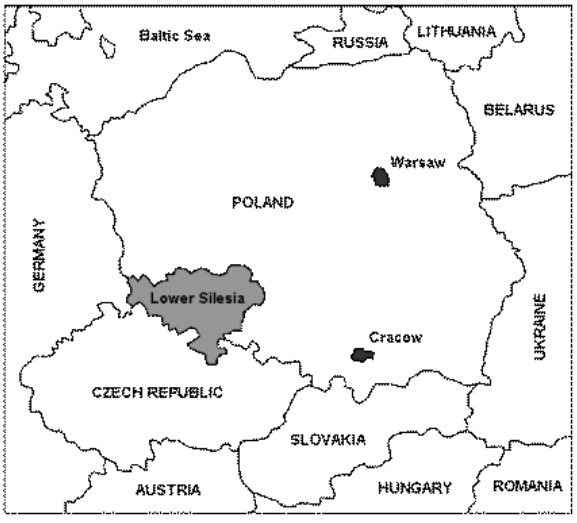
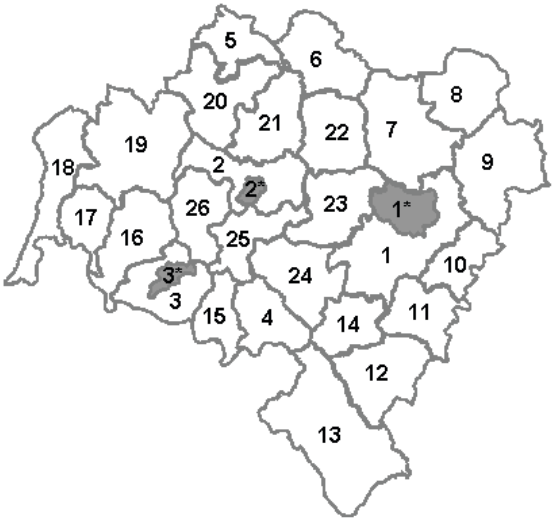
Figure 1. Map of the Lower Silesian province and its division into counties (cities with county rights are indicated with an asterisk): 1, 1*, Wrocław; 2, 2*, Legnica; 3, 3*, Jelenia Góra; 4, Wałbrzych; 5, Głogów; 6, Góra; 7, Trzebnica; 8, Milicz; 9, Oleśnica; 10, Oława; 11, Strzelin; 12, Ząbkowice; 13, Kłodzko; 14, Dzierżoniów; 15, Kamienna Góra; 16, Lwówek; 17, Lubań; 18, Zgorzelec; 19, Bolesławiec; 20, Polkowice; 21, Lubin; 22, Wołów; 23, Środa; 24, Świdnica; 25, Jawor; 26, Złotoryja.





The Lower Silesian Cancer Registry was formed on the basis of information provided by the health care institutions that have diagnosed and/or treated the cancers. The source data, in the form of cancer registration cards (CRC), consists of each patient's basic personal characteristics and information on the location, morphology and clinical stage of the tumor as well as the dates of diagnosis and eventual death.

Reliability of the data from the Lower Silesian Cancer Registry is high, since the health care institutions that register cancers are regularly controlled and the death certificates verified [5,6]. As a result of their high quality, since 1983 the Registry is member of the International Agency for Research on Cancer (IARC, Lyon, France) and its data are considered in Cancer Incidence in Five Continents, the periodical publication of IARC [1,7,8].

The following parameters taken from the Lower Silesian Cancer Registry were analyzed: (1) the annual age adjusted rates of colon and rectal cancer incidence; (2) the fraction of cases detected in five-year age brackets; (3) the percentage of cancers diagnosed at different stages of progression [9]; (4) the percentage of a 5-year overall relative survivals of colon and rectal cancer patients diagnosed between 1984 and 1997; and, (5) the fraction of cancer cases diagnosed in Lower Silesia and treated surgically at the Regional Comprehensive Cancer Center (RCCC) in Wroclaw.

3. Results

The age adjusted rates of colon and rectal cancer incidence increased markedly between 1984 and 2003 in both the genders (Figures 2, 3). The higher relative increase of the new case numbers was recorded for colon cancer and amounted to 14.6% and 10.9% per year in men and women, respectively, whereas the figures of rectal cancer cases increased by 5.3% and 3.7% per year for men and women, respectively.

Figure 2. Age adjusted rates of incidence of colon (□) and rectal (●) cancer among Lower Silesian males between 1984 and 2003. The trend lines were determined by line regression analysis.

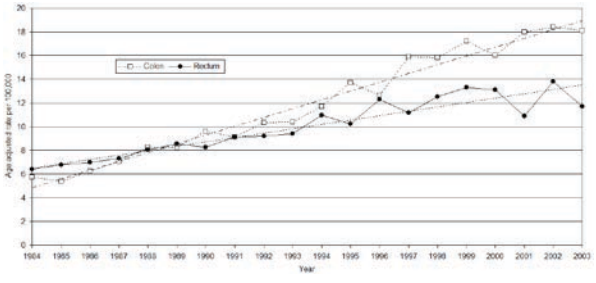
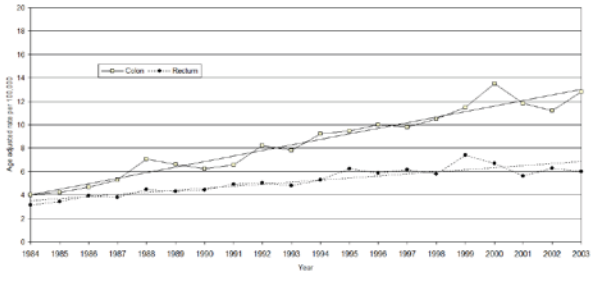


Figure 3. Age adjusted rates of incidence of colon (□) and rectal (●) cancer among Lower Silesian women between 1984 and 2003. The trend lines were determined by line regression analysis.



The age-specific incidence of either colon or rectal cancer increased markedly with age in both genders (Figures 4, 5).

Figure 4. Age-specific incidence (per 100,000) of colon cancers diagnosed between 1984 and 2003 in Lower Silesia.

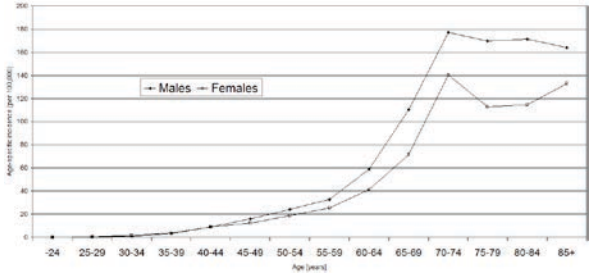
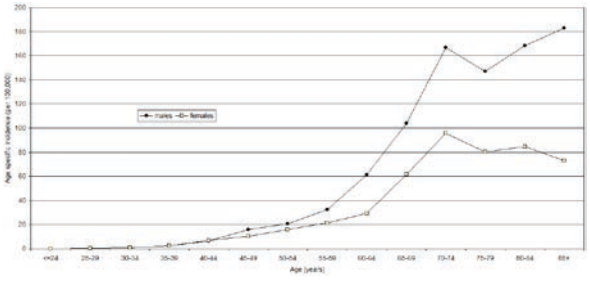


Figure 5. Age-specific incidence (per 100,000) of rectal cancers diagnosed between 1984 and 2003 in Lower Silesia.



No constant time trend toward the earlier diagnosis of CRC was noted in the period studied. Although the fraction of tumors diagnosed at local stages (stage I and II, according to AJCC/UICC [9]) increased by 1993, it was again reduced between 1994 and 2003 for both colon and rectal cancer (Table 1).

The percentages of a 5-year overall relative survivals observed among patients diagnosed between 1984 and 1997 were found to improve with time (Table 2). Although the number of colon cancer surgeries performed at the RCCC has increased over time, they were still related to less than 10% of patients diagnosed with that malignancy in Lower Silesia. The time-related increase in the number of rectal surgeries performed at our hospital was more evident, but about 80% of cases diagnosed were treated outside that reference center (Table 3).

4. Discussion

The present study has revealed that the continuous increase of CRC incidence was a characteristic for the Lower Silesia province between 1984 and 2003. If an intensive increase in new case numbers, demonstrated by 2003, is not moderated, soon the incidence of both malignancies will become one of the highest in Europe [1].

Moreover, the incidence of colorectal malignancies recorded in Lower Silesia was one of the highest in Poland. In 2002, the crude incidence of colon cancer in the Lower Silesian province amounted to 20.7 and 24.6 per 100,000 women and men, respectively, and was significantly higher compared to the rest of Poland (16.7 and 18.1 per 100,000 women and men, respectively) [3]. Similarly, the incidence of rectal cancer in the region studied was higher compared to the rest of the country. In 2002, the crude coefficients of incidence in Lower Silesia amounted to 13.3 and 19.6 per 100,000 women and men, respectively, being significantly higher than in the remaining Polish provinces (12.2 and 16.4 per 100,000 women and men, respectively) [3].

The reason for the unfavorable incidences seems to be related to the significant exposure of Lower Silesians to the etiological factors of CRC. The incidence of this malignancy is the complex outcome of various risk factors, including the genetic and dietetic ones [10-12].

Genetic predisposition is considered an important etiological factor of CRC. Several genes whose abnormalities are related to that malignancy were identified during the last few years. Among them, the functions of mismatch repair genes MSH2 and MLH1 were the most widely studied. Consequently, genetic testing for abnormalities in susceptible genes and the organization of the registries of CRC families are gaining increased popularity worldwide. Large genetic studies performed in Poland have revealed that fifty MSH2 and MLH1 mutations were characteristic for the local population [13]. Our previous study had demonstrated that these abnormalities were also present in the Lower Silesian population [14]. However, in our current study we have detected them in less than 10% of CRC cases. Consequently, both our experience and the literature data [15] suggest that although genetic predisposition markedly increases the risk of disease, the prevalence of inherited malignancies is relatively low in the pool of all CRC cases diagnosed.

According to our knowledge, relationships between CRC incidences and the exposure of Lower Silesian to the non-genetic risk factors of this malignancy were not tested up to this time. Some data suggest that the increasing incidence may be related to the dietary habits that have changed due to the improved social status observed in the region studied after 1990 [16].

The distribution of colon and rectal tumors recorded at different progressions suggests that the diagnostics of those malignancies in Lower Silesia is still inadequate. Too many cases were diagnosed at the locoregional stage or even as a systemic disease, which undoubtedly results in poor outcomes of CRC patients. It is probably related to the lack of a large-scale screening program

Table 1. Percentages of colon and rectal cancers diagnosed at different stages of progression [9] between 1984 and 2003.

Period	1984-1988	1989-1993	1994-1997	1998-2003	
Colon cancer	local (I & II)	31.3	45.9	40.9	33.5
	locoregional (III)	23.1	22.7	27.3	34.1
	disseminated (IV)	45.6	31.4	31.8	32.4
	TOTAL	100.0	100.0	100.0	100.0
Rectal cancer	local (I & II)	38.8	48.8	43.6	32.2
	locoregional (III)	22.7	24.4	26.0	34.8
	disseminated (IV)	38.5	26.8	30.4	33.0
	TOTAL	100.0	100.0	100.0	100.0

Table 2. Percentages of 5-year relative survivals in CRC patients diagnosed between 1984 and 1997.

Period	1984-1988	1989-1993	1994-1997
Colon cancer - males	23.7%	32.7%	35.%
Colon cancer - females	28.9%	30.6%	36.%
Rectal cancer - males	23.0%	23.3%	40.%
Rectal cancer - females	25.3%	24.2%	31.%

of CRC in the region [17,18]. Moreover, both our own experiences at the Regional Comprehensive Cancer Center and the literature data suggest that colorectal cancer is frequently misdiagnosed by primary-care physicians. Rectal bleeding is attributed to hemorrhoids rather than to the malignancies of the rectum and consequently oncological treatment is delayed [19].

Despite an early diagnosis, proper treatment is crucial for a successful outcome in cancer patients. Our analysis revealed that between 1984 and 1997 the percentage of 5-year overall relative survivals in Lower Silesian CRC patients increased, especially in cases of colon malignancies. The therapeutic results, however, were still worse compared to developed countries. According to 1989-1996 population-based data, the fraction of 5-year survivals of CRC patients treated in the United States reached 61% [20]. The percentages of 5-year survivals recorded between 1996 and 1999 in Swiss patients treated for colon and rectal carcinomas amounted to 41-48% and 48-51%, respectively [21].

It is plausible that therapeutic results in our region would improve if most patients were treated primarily at specialized oncological centers. Although the percentage of colon and rectal cancers consulted and operated on at the RCCC has increased with time, still most of the cases were treated outside that reference clinic. This is hardly justifiable in view of the therapeutic results achieved at the RCCC. The survivals of colon and particularly of rectal cancer patients treated at RCCC were significantly better compared to the Lower Silesian province itself. For instance, the percentage of 5-year overall relative survivals in colon cancer patients treated at the RCCC between 1982 and 1991 corresponded to 44% [22].

In conclusion, the proposal of the following efforts should be performed to improve the CRC care in Lower Silesia: (1) Constant education and awareness directed to patients concerning the positive effects of a healthy lifestyle and dietary habits that contributes to the prevention of colorectal cancer; (2) Implementation of a large-scale and effective screening program for early detection, including colonoscopy preceded by the fecal occult blood test; (3) Centralization of CRC treatment in the reference oncological centers.

Table 3. Percentages of colon and rectal cancer cases diagnosed in Lower Silesia and treated surgically at the Regional Comprehensive Cancer Center (RCCC) in Wroclaw between 1984 and 2003.

Period	1984-1988	1989-1993	1994-1997	1998-2003	
Colon cancer	at RCCC	1.8	2.0	4.6	7.2
	outside RCCC	98.2	98.0	95.4	92.8
	TOTAL	100.0	100.0	100.0	100.0
Rectal cancer	at RCCC	6.4	6.9	11.0	14.7
	outside RCCC	93.6	93.1	89.0	85.3
	TOTAL	100.0	100.0	100.0	100.0

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