International Journal of Colorectal Disease (2019) 34:555–558
https://doi.org/10.1007/s00384-018-03228-4

SHORT COMMUNICATION

Suicide risk among colorectal cancer patients in Lithuania

Audrius Dulskas[1,2,3] · Ausvydas Patasius[4,5] · Auguste Kaceniene[4] · Vincas Urbonas[5] · Giedre Smailyte[4,6]

Accepted: 21 December 2018 / Published online: 7 January 2019

Abstract

Purpose We aimed to estimate suicide risk among colorectal cancer patients in the country showing the highest suicide rates among developed countries.

Methods Patients with colorectal cancer diagnosed between 1998 and 2012 were identified from the Lithuanian Cancer Registry. Standardised mortality ratios (SMRs) for suicide were calculated for patients diagnosed with cancer in Lithuania, relative to suicide rates in the general population.

Results Twenty thousand seven hundred sixty-five primary colorectal cancer cases diagnosed between 1998 and 2012 were extracted from the database. Among 19,409 first primary colorectal cancer patients, we identified 67 suicides and the expected number of suicides calculated from general population was 41.4 in this cohort, resulting in an SMR of 1.62 for both sexes (95% CI, 1.27–2.06). A higher suicide risk was found for women (SMR 2.15; 95% CI 1.35–3.41), than for men (SMR 1.48; 95% CI 1.12–1.96). The suicide risk was almost twice higher in patients 60 and older, with highest increase in the oldest patients (SMR 2.12, 95% CI 1.01–4.46). The risk of suicide was not significantly elevated in colorectal cancer patients with localised tumours, but there was a fourfold increase in risk in patients with stage IV tumours. Compared with the general population, the risk of suicide among colorectal cancer patients was four times higher during the first 3 months after diagnosis and decreased thereafter.

Conclusions The patients with colorectal cancer have a higher rate of suicide compared with the general Lithuanian population. Sex, age, advanced rectal cancer and distant spread of disease were the main predictors of suicide among colorectal cancer patients.

Keywords Colorectal cancer · Suicide · Predictors · Population-based study

Introduction

Over 1.8 million new colorectal cancer cases and 881,000 deaths are estimated to occur in 2018, accounting for about 1 in 10 cancer cases and deaths [1]. The incidence of colorectal cancer is increasing in certain countries where risk has been historically low, most notably in economically transitioning Eastern European countries, including Lithuania [2]. In Lithuania, 5-year overall survival rate has increased from 55.4 up to 63.4% in 2005 and 2010 [3].

Registry-based studies suggest an increased risk of suicide among cancer patients world-wide and in Lithuania [4–6].

Lithuania is among the highest rates of suicides—age standardised suicide rate was 25.7 for both sexes, and it comes to even 47.5 in male sex in 2016 (http://apps.who.int/gho/data/node.main.MHSUICIDEASDR?lang=en). The suicide rate has declined over the past few years from 30.41 suicides

✉ Audrius Dulskas
audrius.dulskas@gmail.com

[1] Department of Abdominal and General Surgery and Oncology, National Cancer Institute, 1 Santariskiu Str., LT-08406 Vilnius, Lithuania

[2] Faculty of Health Care, University of Applied Sciences, 45 Didlaukio Str., LT-08303 Vilnius, Lithuania

[3] Department of Surgery, National Cancer Institute, Clinic of Internal, Family Medicine and Oncology, Faculty of Medicine, Vilnius University, 1 Santariskiu Str., LT-08406 Vilnius, Lithuania

[4] Laboratory of Cancer Epidemiology, National Cancer Institute, LT-08406 Vilnius, Lithuania

[5] Laboratory of Clinical Oncology, Department of Medical Oncology, National Cancer Institute, Vilnius, Lithuania

[6] Institute of Public Health, Faculty of Medicine, Vilnius University, LT-03101 Vilnius, Lithuania

per population of 100,000 in 2015 to 26 last year (https://osp.stat.gov.lt/). In particular, it is important to explore whether suicide risk is affected by a cancer diagnosis among colorectal cancer patients in Lithuania in relation sociodemographic groups, anatomic cancer sites, tumour characteristics and time since diagnosis.

To our knowledge, there are only three studies assessing predictors of suicide in colorectal cancer specifically [6–8].

Patients and methods

In total, 20,765 primary colorectal cancer cases diagnosed between 1998 and 2012 were extracted from the Cancer Registry database. Patients for whom the recorded date of diagnosis was the same as the date of death (1341 (%) of all cases), cases lost to follow-up (11 (%) of all cases) and patients with missing information on cause of death (4 (0.03%) of all deaths) were not included. Finally, 19,409 first primary colorectal cancer cases (9504 among men and 9905 among women) were included in the analysis, contributing to 85,505.6 person-years (39,551.3 and 45,954.3 for females and males, respectively). Available data for this analysis included sex, age, date of diagnosis and date of death, underlying cause of death, cancer site and tumour stage. Patients were identified using International Classification of Diseases (ICD–10 codes C18–C21) for primary colorectal cancer topography (disease). The mortality codes for suicide and self-inflicted injuries were defined as X60–X84. Standardised mortality ratios (SMRs) were examined in relation to a number of factors: sex (separately for men and women), age at diagnosis (< 50, 50–59, 60–69, 70–79, ≥ 80), calendar period of diagnosis (1998–2002, 2003–2007, 2008–2012), time since colorectal cancer diagnosis (1–3, 4–6, 7–12 months, and 2–4 or > 5 years), extent of disease and cancer site (C18–19, C20–21). Person-years were computed from the date of colorectal cancer diagnosis to the first of the following events: death, emigration or end of the follow-up (31 December 2016). Sex, age and calendar period SMRs were calculated by dividing the observed numbers of suicides among cancer patients by the expected number of deaths, calculated using national rates. Assuming that data followed a Poisson distribution, 95% confidence intervals (CIs) for SMRs were calculated.

All statistical analyses were carried out using STATA, version 11; StataCorp., College Station, TX, USA.

Results

Among 19,409 first primary colorectal cancer patients, we identified 67 suicides and the expected number of suicides calculated from general population was 41.4 in this cohort, resulting in an SMR of 1.62 for both sexes (95% CI, 1.27–2.06). A higher suicide risk was found for women (SMR 2.15; 95% CI 1.35–3.41) than for men (SMR 1.48; 95% CI 1.12–1.96) (Table 1). The suicide risk was almost twice higher in patients 60 and older, with highest increase in the oldest patients (SMR 2.12, 95% CI 1.01–4.46). We found decreasing risk of suicide by period of diagnosis. The risk of suicide was significantly increased in colorectal cancer patients diagnosed with cancer in 1998–2002, as compared to the general population (SMR 2.14; 95% CI 1.54–2.96) and became similar to the general population rates in patients diagnosed with colorectal cancer in 2008–2012 (SMR 1.04; 95% CI 0.58–1.88). The risk of suicide was not significantly elevated in colorectal cancer patients with localised tumours, but there was a fourfold increase in risk in patients with stage IV tumours (SMR 4.16; 95% CI, 2.31–7.53). The risk was elevated in both patients with colon and rectal cancer, significant differences were observed only for rectal cancer patients (SMR 1.94; 95% CI, 1.39–2.70). Compared with the general population, the risk of suicide among colorectal cancer patients was four times higher during the first 3 months after diagnosis (SMR 4.28, 95% CI 2.30–7.96) and decreased thereafter. However, suicide risk remained significantly higher during the first 5 years after diagnosis.

Discussion

We found that patients with colorectal cancer have an approximately fourfold higher risk of suicide compared with the general Lithuanian population. Previous investigators have reported similar findings [6–8]. Just recently, *Sun* et al. has published their results from Taiwan population-based study showing statistically significant higher risk of suicide in the colorectal cancer group compared with the control group [7].

Our results that female sex is a risk factor for suicide are totally different from the findings of previous studies in colorectal cancer [6, 7] and from general Lithuanian population [8]. The possible explanation might be the changes of body image after getting stoma or significant changes in pelvic organ functions (bowel dysfunction, urogenital dysfunction) which significantly affect the quality of life [9, 10].

We have also found that the advanced disease in rectal cancer increases the suicidal risk. The same results were shown in all similar studies [6–8]. This also can be explained by the differences in symptoms of proximal colon and distal rectum, different treatment modalities (while in rectal cancer, there can be chemoradiotherapy prescribed before definite surgery—longer treatment period) and increased chance of getting stoma. Different treatment modalities affect quality of life significantly. This also raises a question whether these patients get proper counselling about the treatment process.

Table 1 Suicide risk by sex, age, period of diagnosis, extent of disease and time after diagnosis of cancer among colorectal cancer patients in Lithuania, 1998–2012

	Male						Female						Overall					
	Obs	Exp	SMR	CI95L	CI95U	*p* value	Obs	Exp	SMR	CI95L	CI95U	*p* value	Obs	Exp	SMR	CI95L	CI95U	*p* value
Overall	49	33.0	1.48	1.12	1.96	0.005	18	8.4	2.15	1.35	3.41	< 0.001	67	41.4	1.62	1.27	2.06	< 0.001
Age at diagnosis																		
< 50	3	3.8	0.78	0.25	2.42	0.681	1	0.6	1.62	0.23	11.51	0.041	4	4.5	0.90	0.34	2.39	0.814
50–59	4	6.7	0.60	0.22	1.59	0.297	5	1.3	3.82	1.59	9.17	0.001	9	8.0	1.12	0.59	2.16	0.724
60–69	22	11.3	1.95	1.28	2.96	< 0.001	5	2.4	2.06	0.86	4.96	0.093	27	13.7	1.97	1.35	2.87	< 0.001
70–79	15	9.0	1.67	1.01	2.77	0.046	5	3.0	1.68	0.70	4.04	0.248	20	11.9	1.67	1.08	2.59	0.012
≥ 80	5	2.2	2.24	0.93	5.38	0.059	2	1.1	1.88	0.47	7.52	0.391	7	3.3	2.12	1.01	4.46	0.042
Year of diagnosis																		
1998–2002	27	13.2	2.04	1.40	2.98	< 0.001	9	3.6	2.49	1.30	4.79	0.004	36	16.8	2.14	1.54	2.96	< 0.001
2003–2007	13	11.2	1.16	0.67	2.00	0.591	7	2.8	2.50	1.19	5.25	0.012	20	14.0	1.43	0.92	2.22	0.109
2008–2012	9	8.6	1.05	0.54	2.01	0.892	2	2.0	1.01	0.25	4.06	1	11	10.6	1.04	0.58	1.88	0.902
Diagnosis																		
C18–C19	21	18.2	1.16	0.75	1.77	0.512	11	5.2	2.12	1.18	3.83	0.011	32	23.4	1.37	0.97	1.94	0.075
C20–C21	28	14.8	1.89	1.30	2.73	< 0.001	7	3.2	2.19	1.04	4.59	0.034	35	18.0	1.94	1.39	2.70	< 0.001
Extent of disease																		
Tumour localised	8	5.7	1.40	0.70	2.80	0.335	3	1.5	1.95	0.63	6.04	0.221	11	7.3	1.52	0.84	2.74	0.171
Tumour with local spread	22	14.7	1.50	0.98	2.27	0.057	5	3.4	1.47	0.61	3.54	0.386	27	18.1	1.49	1.02	2.17	0.036
Tumour with regional spread	10	7.7	1.30	0.70	2.42	0.257	3	2.2	1.38	0.45	4.29	0.590	13	9.9	1.32	0.77	2.27	0.325
Advanced cancer	5	2.2	2.28	0.95	5.49	0.059	6	0.5	13.27	5.96	29.55	< 0.001	11	2.6	4.16	2.31	7.52	< 0.001
Unknown extent	4	2.7	1.47	0.55	3.92	0.429	1	0.8	1.21	0.17	8.57	0.823	5	3.5	1.41	0.59	3.39	0.423
Time after diagnosis																		
1–3 months	8	1.9	4.22	2.11	8.44	< 0.001	2	0.4	4.55	1.14	18.20	0.011	10	2.3	4.28	2.30	7.96	< 0.001
4–6 months	6	1.7	3.61	1.62	8.04	< 0.001	2	0.4	5.22	1.30	20.86	0.011	8	2.0	3.91	1.96	7.82	< 0.001
7–12 months	7	2.94	2.38	1.13	4.99	0.018	1	0.68	1.47	0.21	10.43	0.698	8	3.62	2.21	1.10	4.42	0.021
2–5 years	23	14.9	1.54	1.02	2.32	0.036	10	3.6	2.78	1.50	5.17	< 0.001	33	18.5	1.78	1.27	2.51	< 0.001
> 5 years	5	11.6	0.43	0.18	1.03	0.053	3	3.3	0.91	0.29	2.83	0.869	8	14.9	0.54	0.27	1.07	0.074

The decrease of suicide in patients with colorectal cancer in period 2008–2012 was found—this is almost the same as in general population.

In our study, patients with colorectal cancer have higher risk of suicide than the general Lithuania population. The rate of suicide is highest within the first 3 months after diagnosis. Female sex, advanced rectal cancer, distant stage disease is significantly associated with increased risk of suicide.

References

1. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A (2018) Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin 68:394–424. https://doi.org/10.3322/caac.21492
2. Center MM, Jemal A, Ward E (2009) International trends in colorectal cancer incidence rates. Cancer Epidemiol Biomark Prev 18: 1688–1694
3. Poskus E, Kryzauskas M, Poskus T, Mikalauskas S, Samalavicius NE, Aliosin O, Dailidenas S, Tamelis A, Saladzinskas Z, Lizdenis P, Jakaitiene A, Smailyte G, Strupas K (2018) Improved perioperative care is associated with improved long-term survival in colorectal cancer. Int J Color Dis 33:779–785
4. Kaceniene A, Krilaviciute A, Kazlauskiene J, Bulotiene G, Smailyte G (2017) Increasing suicide risk among cancer patients in Lithuania from 1993 to 2012: a cancer registry-based study. Eur J Cancer Prev 26:S197–S203
5. Park SA, Chung SH, Lee Y (2016) Factors associated with suicide risk in advanced cancer patients: a cross-sectional study. Asian Pac J Cancer Prev 17(11):4831–4836
6. Samawi HH, Shaheen AA, Tang PA, Heng DYC, Cheung WY, Vickers MM (2017) Risk and predictors of suicide in colorectal cancer patients: a surveillance, epidemiology, and end results analysis. Curr Oncol 24(6):e513–e517
7. Sun LM, Lin CL, Hsu CY, Kao CH (2018) Risk of suicide attempts among colorectal cancer patients: a nationwide population-based matched cohort study. Psychooncology 27:2794–2801. https://doi.org/10.1002/pon.4891
8. Pham TT, Talukder AM, Walsh NJ, Lawson AG, Jones AJ, Bishop JL, Kruse EJ (2018) Clinical and epidemiological factors associated with suicide in colorectal cancer. Support Care Cancer. https://doi.org/10.1007/s00520-018-4354-3
9. Dulskas A, Miliauskas P, Tikuisis R, Escalante R, Samalavicius NE (2016) The functional results of radical rectal cancer surgery: review of the literature. Acta Chir Belg 116:1–10
10. da Silva GM, Hull T, Roberts PL, Ruiz DE, Wexner SD, Weiss EG, Nogueras JJ, Daniel N, Bast J, Hammel J, Sands D (2008) The effect of colorectal surgery in female sexual function, body image, self-esteem and general health: a prospective study. Ann Surg 248: 266–272