Cancer Epidemiology 37 (2013) 714–718

Contents lists available at SciVerse ScienceDirect

Cancer Epidemiology

The International Journal of Cancer Epidemiology, Detection, and Prevention

journal homepage: www.cancerepidemiology.net

Suicides among cancer patients in Lithuania: A population-based census-linked study

Giedre Smailyte [a,b,*], Domantas Jasilionis [b,c], Auguste Kaceniene [a], Agne Krilaviciute [a], Dalia Ambrozaitiene [b,d], Vladislava Stankuniene [b]

[a] Lithuanian Cancer Registry, Institute of Oncology, Vilnius University, P. Baublio g. 3B, LT-08406 Vilnius, Lithuania
[b] Institute for Demographic Research, Lithuanian Social Research Centre, Gostauto g. 11, LT-01108 Vilnius, Lithuania
[c] Laboratory of Demographic Data, Max Planck Institute for Demographic Research, Konrad-Zuse-Straße 1, 18057 Rostock, Germany
[d] Statistics Lithuania, Gedimino pr. 29, LT-01500 Vilnius, Lithuania

ARTICLE INFO

Article history:
Accepted 29 May 2013
Available online 25 June 2013

Keywords:
Cancer patients
Suicide
Standardized mortality ratio
Record linkage

ABSTRACT

Background: This study aims to estimate suicide risk and its socio-demographic determinants among cancer patients in the country showing the highest suicide rates among developed countries. *Methods*: The study is based on a unique census-linked dataset based on the linkages between the records from death and cancer registers and the 2001 population census records. Standardized mortality ratios for suicide (SMRs) were calculated for patients diagnosed with cancer in Lithuania between April 6, 2001 and December 31, 2009, relative to suicide rates in the general population. *Results*: We found that the relative suicide risk was elevated for both males and females, with SMRs of 1.43 (95% CI 1.23–1.66) and 1.32 (95% CI 0.95–1.80), respectively. This relationship for females became statistically significant and stronger after excluding skin cancers. The highest suicide risks were observed at older ages and during the period shortly after the diagnosis. The groups showing an increased suicide risk include lower educated, non-married, and rural male patients. *Conclusion*: The results of our study point to inadequacies of the health care system in dealing with mental health problems of cancer patients. Interventions allowing early detection of depression or suicidal ideation may help to prevent suicide among cancer patients in Lithuania.

1. Introduction

Registry-based European studies suggest an increased risk of suicide among cancer patients in Nordic countries [1–6], Switzerland [7], Italy [8,9], England [10] and Estonia [11]. The results appear to be consistent for males, but not for females. The findings from the USA, Australia, South Korea and other countries outside Europe also confirm this pattern [12–16].

It has been shown that the highest risk of committing suicide was during the first year [5,7,10,11,16] or even in the first months [4,6,8,11] after the diagnosis. The results notably differ by anatomic cancer site. The highest suicide risk was found among patients with respiratory and gastrointestinal cancers [1–5,7,11,14,16]. A notably increased risk was found for cancers of the brain and nervous system [4,14], lymphatic and haematopoietic tissue [2,4,5,7,14], breast (for females only) [2,4,5,14,16], and prostate and other genital organs for males [2,4,5,7,11,14]. The risk of suicide was higher in cancers with poor prognosis and non-localized disease [1,3–6,9,10,14–16].

Levels, patterns, and determinants of suicide risk of cancer patients may notably differ across countries and even continents. This variation can be at least partly explained by differences in socio-cultural characteristics (including attitudes towards both cancer patients and suicide phenomenon) and general levels of suicide across societies. In this respect, Lithuania being a long-standing leader (since the mid-1990s) in suicide rates among the developed countries represents an interesting case for analysis. According to the data for 2009, age-standardized suicide rate was at a striking level of 31.5 per 100,000 (58.5 and 8.9 per 100,000 for males and females, respectively) [17]. In particular, it is important to explore whether generally high suicide rates in the society predetermine higher suicide rates among cancer patients and how the suicide risk differs by anatomic cancer sites and across socio-demographic groups. To our knowledge, no previous study based on the population-level data thoroughly studied suicides among cancer patients in Lithuania.

* Corresponding author at: Lithuanian Cancer Registry, Institute of Oncology, Vilnius University, P. Baublio g. 3B, LT-08406 Vilnius, Lithuania.
Tel.: +370 5 2190927; fax: +370 5 2190927.
E-mail address: giedre.smailyte@vuoi.lt (G. Smailyte).

1877-7821/$ – see front matter © 2013 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.canep.2013.05.009

2. Materials and methods

2.1. Study design and data

The study is based on a unique census-linked dataset covering the entire population provided by Statistics Lithuania. The linkages between the 2001 census records, death records, and cancer records from the Cancer Registry were implemented by employees of Statistics Lithuania, who have permission to work with individual-level data. The data for further analyses were provided in an aggregated multidimensional frequency table format that combines first diagnosed cancer cases, deaths, and person years of exposure to risk and are split by socio-demographic variables, including age, sex, education, marital status, ethnicity and urban–rural residence. The records of all cancer patients diagnosed with invasive cancer between April 6, 2001 and December 31, 2009 were extracted from the database of the Lithuanian Cancer Registry (137,320 cases, only first cancers included).

The Lithuanian Cancer Registry is a population-based cancer registry. It contains personal and demographic information as well as information on diagnosis of all cases of cancer diagnosed among all residents. The principal information sources on cancer cases are primary, secondary and tertiary health care institutions in the country that are responsible to fill in the notification when cancer is diagnosed. All physicians, all hospitals and other institutions in the country must send a notification to the Lithuanian Cancer Registry of all cancer cases that come to their attention. The Lithuanian Cancer Registry data for the periods 1988–1992, 1993–1997 and 1998–2002 have been included in the publications 'Cancer Incidence in Five Continents' [18,19].

The Census of 2001 was carried out on the 6th of April 2001 and included all permanent residents on the territory of Lithuania. Person years of exposure to risk of suicide were estimated by adding up all years of persons living in Lithuania between April 6, 2001 and December 31, 2009. For individuals who died or emigrated, the exposure time was censored at the date of death or emigration. Information about external migration was drawn from the Population Register database. Death records of all individuals who died between April 6, 2001 and December 31, 2009 and Registry records of all cancer cases diagnosed during this period were linked to the Census data. In this study we used the same record linkage procedures as described in previous studies [20,21].

96.5% of the cancer records of all cases of first cancers diagnosed between April 6, 2001 and December 31, 2009 were successfully linked to the census data (96.1% of male cases and 96.8% of female cases). Only census-linked registry records were used in the analysis. During the follow-up period, 132,459 cases of first cancer, 69,221 among men and 63,238 among women, respectively, were included in the analysis. Among these, 126,402 had one tumour and 6057 had two or more tumours. We excluded cancer cases registered only according to the cause of death indicated in the death certificate or for whom the recorded date of diagnosis was the same as the date of death. Since 1998 the Cancer Registry has been using the 10-th revision of the International Classification of Diseases (ICD-10). The corresponding codes for suicide were X60-X84 (intentional self-harm). The general problem concerning the validity of suicide statistics is well known. As the possibility of suicide misclassification exists due to the registration procedures as well as due to some ethical reasons, an additional sensitivity analysis was made for the group of injury deaths of undetermined intent (ICD-10 codes Y10-Y34).

For cancer patients, person years of exposure to risk of suicide were calculated starting from the date of the cancer diagnosis either until death or emigration or to the end of the period of observation (December 31, 2009). For individuals with more than one cancer diagnosis, the date of the first cancer was taken as the starting point.

The analysis of suicide risk by demographic characteristics was restricted to persons who were aged 30–74 years at the Census (on the 6th of April 2001). The data account for the changes in the age of persons during each calendar year of the follow-up period.

The risk of suicide was analyzed in three education categories: high (at least 14 years of schooling), medium (10–13 years) and low education (up to 9 years or unknown); by marital status (single, married, widowed, divorced), place of residence (urban, rural), and sex (male, female).

2.2. Statistical analysis

The SMRs were computed by calculating the ratio between observed and expected suicide cases among cancer patients. The expected suicide cases among cancer patients were calculated by multiplying 5-year age- and sex-specific suicide rates for the entire population by the corresponding numbers of person years of exposure to risk of suicide for the cancer patients. Age- and sex-specific suicide rates for the entire population were calculated by dividing suicide deaths by person years of exposure at risk obtained from the census-linked dataset. 95% confidence intervals (CI) were computed assuming that the observed deaths followed a Poisson distribution.

3. Results

In Lithuania, 215 persons with first cancer diagnosis (174 males and 41 females) committed suicide between April 6, 2001 and December 31, 2009. As for all cancer sites combined, the study found a significantly elevated suicide risk only for male cancer patients (Table 1). However, after exclusion of skin cancers, both males and females showed statistically significant SMRs (1.55 times (95% CI 1.32–1.81) for males and 1.64 times (95% CI 1.16–2.26) for females, respectively (results not shown)).

For males, the highest suicide risk was among patients with oesophagus cancer and lung cancer (Table 1). A significantly increased risk of suicide was also found among males with cancers of the buccal cavity and pharynx and colorectal cancers. Among females, only colorectal and haematopoietic cancer patients showed a significantly increased suicide risk, whereas the suicide risk for female cancer patients with breast and genital organs cancer diagnoses was not statistically significantly different from that of the general population.

The highest disadvantage of cancer patients in suicide risk was found after the age 60. The exception concerns female cancer patients above age 70 showing no statistically significant difference in cancer risk (Table 2). The highest disadvantage in suicide risk was found during the first 3 months after the diagnosis, especially for female patients (Table 3). After the third month the excess suicide risk of cancer patients was decreasing and became statistically insignificant after the 6th month since the diagnosis.

The methods of suicide among Lithuanian cancer patients were similar to those observed in the general population (Table 4). Hanging was the most common method of completed suicide and was more prevalent among males in comparison to females. Firearms were used among males as the next most prevalent method of suicide, while females used the method of jumping from a height.

It was also possible to assess the excess suicide risk of adult cancer patients (aged 30–74 on census) in each socio-demographic group by comparing suicide rates to the age-specific suicide mortality rates observed in the entire population (Table 5). The highest disadvantage in suicide was observed among never married or divorced (for both almost 3 times), lower educated