



Contents lists available at ScienceDirect

Schizophrenia Research

journal homepage: www.elsevier.com/locate/schres

Disparity of end-of-life care in cancer patients with and without schizophrenia: A nationwide population-based cohort study

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ARTICLE INFO

Article history:

Received 17 March 2017

Received in revised form 4 August 2017

Accepted 15 October 2017

Available online xxxxx

Keywords:

Cancer

Schizophrenia

Cohort study

End-of-life care

Health disparities

ABSTRACT

Background: Cancer patients with schizophrenia may face disparities in end-of-life care, and it is unclear whether schizophrenia affects their medical care and treatment.

Methods: We conducted a nationwide population-based cohort study based on the National Health Insurance Research Database of Taiwan. The study population included patients >20 years old who were newly diagnosed as having one of six common cancers between 2000 and 2012 (schizophrenia cohort: 1911 patients with both cancer and schizophrenia; non-schizophrenia cohort: 7644 cancer patients without schizophrenia). We used a multiple logistic regression model to analyze the differences in medical treatment between the two cohorts in the final 1 and 3 months of life.

Results: In the 1 month before death, there was higher intensive care unit utilization in the schizophrenia group [odds ratio (OR) = 1.21, 95% confidence interval (CI) = 1.07–1.36] and no significant differences between the groups in-hospital stay length or hospice care. The schizophrenia patients received less chemotherapy (OR = 0.60, 95% CI = 0.55–0.66) but more invasive interventions, such as cardiopulmonary resuscitation (OR = 1.34, 95% CI = 1.15–1.57). Advanced diagnostic examinations, such as computed tomography/magnetic resonance imaging/sonography (OR = 0.80, 95% CI = 0.71–0.89), were used less often for the schizophrenia patients. The 1- and 3-month prior to death results were similar.

Conclusion: End-of-life cancer patients with schizophrenia underwent more frequent invasive treatments but less chemotherapy and examinations. Treatment plans/advance directives should be discussed with patients/families early to enhance end-of-life care quality and reduce health care disparities caused by schizophrenia.

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1. Introduction

Cancer is the leading cause of death in most developed countries (Ho et al., 2011). With earlier detection of cancer and significant progress in treatments and supportive care in recent years, the survival and quality of life of cancer patients have improved greatly. However, not all cancer patients benefit equally from these advances. Racial minorities, low socio-economic status, lack of medical insurance, residence in remote areas, elderly age, and mental illnesses are all factors that may affect cancer treatment, survival, and care quality (Irwin et al., 2014). The American Society of Clinical Oncology recognized a need to eradicate disparities in cancer care, particularly for disadvantaged people and racial minorities (Goss et al., 2009).

Like other marginalized groups, such as people with low socio-economic status or who are homeless (Lewis et al., 2011; O'Connell,

2005), people with severe mental illnesses often encounter more obstacles within current medical systems, have greater medical morbidity, receive poorer medical care, and die at younger ages (Chochinov et al., 2012; Viron and Stern, 2010). These disparities can be attributed to various factors, including the common stereotypes regarding mental illnesses and the personal factors of the patients, such as cognitive disorders, poverty, more comorbidity, lack of family support, and social isolation (Chochinov et al., 2012; Lawrence and Kisely, 2010).

Research has shown that patients with severe mental illnesses, such as schizophrenia, are at greater risk of dying from cancer (Kisely et al., 2008; Lawrence et al., 2000). However, a recent review indicated that cancer patients with schizophrenia have been largely overlooked in research on cancer care (Irwin et al., 2014). For these disadvantaged individuals, we generally show less concern for the accessibility of their medical care, their unique needs and disabilities, and the quality of their hospice care (Ganzini et al., 2010; Song et al., 2008). Another study pointed out that while the incidence rate of cancer in psychiatric patients is identical to that in individuals with no mental illnesses, the mortality rate of psychiatric patients is 30% higher. The reason for this

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finding could be later discovery, less treatment, or less specialized intervention (Kisely et al., 2013).

Schizophrenia patients generally have impaired decision-making capabilities and are often single and estranged from their families (Foti et al., 2005; Pollio et al., 2002). This situation results in a lack of health care advocates. Patients with schizophrenia may not receive the same number of invasive interventions and advanced diagnostic examinations at the end of their life as patients without mental illnesses.

To date, few existing studies have investigated the influence of schizophrenia on end-of-life care (Chochinov et al., 2012). Even rarer is research on cancer patients with schizophrenia (Ganzini et al., 2010). For this reason, we used nationwide population-based data in Taiwan to compare the medical treatments received by cancer patients with and without schizophrenia within 1 and 3 months prior to their death. It is hoped that the results of this study can further understanding regarding the end-of-life care for patients with both cancer and schizophrenia, thereby improving the quality of their end-of-life care.

2. Materials and methods

2.1. Data sources

The National Health Insurance (NHI) program was instituted in Taiwan in 1995. The NHI covers approximately 99% of the population and has contracts with 97% of the hospitals and clinics (Liang et al., 2011; Wu et al., 2010). The Taiwanese health system is characterized by good accessibility, comprehensive population coverage, low costs, and with a NHI databank for planning, monitoring, and evaluating health services (Wu et al., 2010). NHI of Taiwan offers a comprehensive benefit package. Almost all health services are covered by NHI, such as inpatient and outpatient care, dental care, traditional Chinese medicine, kidney dialysis, preventive services, and elderly home care (Cheng, 2009; Lu and Hsiao, 2003; Wu et al., 2010).

With approval from the National Health Research Institute (NHRI), we obtained NHI claims data from 1999 to 2012, which included the Catastrophic Illness Patient Database, ambulatory claims, inpatient care claims, and the registry of beneficiaries. We used this data to analyze the medical care received by the patients. The International Classification of Disease, 9th Revision, Clinical Modification (ICD-9-CM) was used to identify each patient's disease. To protect patient privacy and information security, all links to personal identification information were removed from the data before it was released by the NHRI (Liao et al., 2014; Liao et al., 2013; Yeh et al., 2013). This study was approved by the Institutional Review Board of the Tzu Chi Medical Center (REC No: IRB103-51-C).

2.2. Study population

The subjects of this study were selected from the Catastrophic Illness Patient Database. This database contains the medical claims data of patients with a catastrophic illness certificate. The Department of Health in Taiwan defines a list of catastrophic illnesses, which contain thirty illnesses or conditions, such as cancer, chronic mental illness like schizophrenia, chronic renal failure requiring kidney dialysis, and congenital illness (Ho Chan, 2010; Nan-Ping et al., 2013).

To apply for a cancer catastrophic illness certificate, physicians are required to provide a report of pathological findings or other supporting documents, such as results of laboratory and imaging studies (Lai et al., 2012). For a catastrophic illness certificate of schizophrenia, a psychiatrist should follow-up with the patient who fulfills the diagnosis criteria of International Classification of Diseases (ICD) and Diagnostic and Statistical Manual of Mental Disorders of schizophrenia, for a specified period of time (usually >6 months as an outpatient department or one month as an inpatient service). Accordingly, patients can apply for the

schizophrenia catastrophic illness certificate with complete medical records (Chou et al., 2011). After reviewing the required medical documents, the Bureau of National Health Insurance approves the application if it meets the requirements (Lai et al., 2012).

As our previous study focused on cancer patients with dementia (Huang et al., 2017), the study population comprised individuals in Taiwan who were newly diagnosed with one of six common cancers between 2000 and 2012 identified from the Catastrophic Illness Patient Database. These cancers included colorectal cancer (ICD-9 code 153–154), liver cancer (ICD-9 code 155), lung cancer (ICD-9 code 162), breast cancer (ICD-9 code 174), oral cancer (ICD-9 codes 140–141, 143–146, 148–149), and prostate cancer (ICD-9 code 185). Patients who 1) had been diagnosed with more than one type of cancer, 2) were <20 years old, 3) were still alive at the end of the study period (December 31, 2012), or 4) had a history of traffic accidents before their deaths were eliminated from the study population. In our study design, we divided the study population into two cohorts: a schizophrenia cohort and a comparison cohort. Among the newly diagnosed patients, we looked for those with the diagnosis code (ICD-9 code 295) and placed them in the schizophrenia cohort. A schizophrenia diagnosis was defined as possessing any one of the following conditions during the study period: 1) having possessed a catastrophic illness card for schizophrenia, 2) having been hospitalized and diagnosed with schizophrenia, or 3) having being diagnosed with schizophrenia two or more times within 1 year in an outpatient clinic. Each newly diagnosed cancer patient with schizophrenia was paired with four other cancer patients who had never been diagnosed with schizophrenia or any other mental disorders (ICD-9 code: 290–319) in both inpatient and outpatient service during the entire period covered by our database (from 1999 to 2012). The matching procedure was performed based on age, sex, type of primary cancer, and death year. We named this comparison cohort as the non-schizophrenia cohort (Fig. 1).

2.3. Research variables and study outcomes

We identified the comorbid conditions of each research subject in the year before their death by using their medical records and calculated their Charlson comorbidity index (Charlson et al., 1987). The demographic and clinical characteristics that we took into account included age, sex, type of primary cancer, death year, duration between cancer diagnosis and death, and whether they had been hospitalized in an acute ward in the month before their death. We also examined their socio-economic status by dividing their income (estimated on the basis of income-related insurance premiums) into four levels: those who made $\geq 40,000$ New Taiwan dollars, those who made 20,000–39,999 New Taiwan dollars, those who made 1–19,999 New Taiwan dollars, and those who were financially dependent.

To determine the influence of schizophrenia on the medical care and treatment of cancer patients near the end of their lives, we analyzed the types of medical care utilized by the schizophrenia and non-schizophrenia patients during the last 1 and 3 months of their lives, including the length of stay in the acute ward and the use of intensive care units (ICUs) and hospice care. We also compared the utilization of chemotherapy, invasive interventions [including cardiopulmonary resuscitation (CPR), endotracheal intubation, mechanical ventilation, urinary catheterization, and feeding tubes], and advanced diagnostic examinations [including computed tomography (CT) or magnetic resonance imaging (MRI) or sonography, panendoscopy, colonoscopy, bone scans, and positron emission tomography (PET) scans] between the schizophrenia cohort and non-schizophrenia cohort. Subsequent subgroup analyses for investigating the difference between schizophrenia and non-schizophrenia cohorts according to different cancer types were also performed.

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