The wait time creep: Changes in the surgical wait time for women with uterine cancer in Ontario, Canada, during 2000–2009 ☆

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HIGHLIGHTS

• Uterine cancer surgery wait times increased steadily between 2000 and 2005, but plateaued between 2006 and 2009.
• Overall, 55% of patients had a wait time longer than 6 weeks after diagnosis,
• Surgery by gynaecologic oncologists or in teaching hospitals increases the odds of wait times >6 weeks by 3- and 2-fold, respectively.

ARTICLE INFO

ABSTRACT

Objective. Uterine cancer is a major cancer of women, with outcomes potentially worsening with delayed diagnosis or hysterectomy, the main treatment. Yet cancer surgery wait times are not reported by cancer site. This study sought to examine changes in wait times for uterine cancer surgery between 2000 and 2009 and to identify predictors of longer surgery wait times.

Methods. Population-based retrospective analysis of a cohort of uterine cancer patients diagnosed between April 2000 and March 2009. Using linked administrative data, all cases in which a patient had hysterectomy following diagnosis were identified. Wait time was defined as days from diagnosis of uterine cancer (day 0) to hysterectomy. Regression analysis was used to examine the relationship between covariates and wait time.

Results. Wait times increased steadily between 2000 and 2006 from a median of 34 to 54 days, followed by a plateau until 2009—during which patients waited a median of between 53 and 55 days for surgery after diagnosis. Overall, 55% of patients had a wait time longer than 6 weeks after diagnosis. Predictors of a wait time greater than 6 weeks included older age, region, lower income, later year of diagnosis, surgery by a gynaecologic oncologist, non-sarcoma histology group and having surgery in a teaching hospital.

Conclusion. Over half of uterine cancer patients waited longer than the recommended 6 weeks for surgery. Future reporting of cancer wait times by each disease site regularly would help to identify progress to reduce wait times and opportunities for improvement.

1. Introduction

The length of time a patient must wait for the care they need, or wait times, including for cancer surgery, are an important healthcare access issue for many countries [1–3]. Long wait times can mean poorer outcomes, quality of life and quality of care [4,5]. Extensive waits for treatment can also exact a psychological toll on patients and families, such as anxiety and distress [6–8]. Prior research has

indicated that wait times were markedly longer in Canada than those in other developed countries across a variety of diseases [9–11]. In a report comparing 14 countries, Canada ranked among the worst performers in all aspects of access to care [12]. For example, Canada had the highest proportion of patients (25%) having to wait 4 months or more for elective surgeries, whereas Germany and the Netherlands had the lowest proportion of 0% and 5%, respectively. Moreover, within Canada, the province of Ontario's cancer wait times were among the poorest in the country with only 60%–69% of patients treated within established benchmarks, whereas the province of British Columbia reported proportions of 80%–100% [13].

In 2005, Ontario's Ministry of Health implemented a Wait Time Strategy to improve quality of care by increasing access and reducing wait times across several diseases [14]. The Wait Time Strategy involved an influx of financial resources distributed to hospitals on

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a per case basis; a national 6-year, $4.5 billion wait time reduction fund was targeted for cancer surgery wait times, as well as cataract surgery, hip and knee replacement and cardiac procedures [15,16]. Ontario initially invested $10 million to increase surgical volume across 27 hospitals in 2004–2005 from the baseline cases reported in 2002–2003. In 2005–2006, they provided a second influx of $27 million to increase cancer surgeries across 37 hospitals by 4,800 cases above the 2002–2003 baseline surgeries [17]. Ontario's cancer agency, Cancer Care Ontario, was responsible for the implementation of the cancer Wait Time Strategy specifically, which aimed to achieve a 6-week benchmark from diagnosis to surgery for all cancers [14]. Since the implementation of the strategy, Cancer Care Ontario has reported improvements in the wait times of cancer surgeries [18,19]. However, further investigation has shown wide variations by cancer site. For example, in 2004, median wait time was calculated as 29 days for mastectomy versus the 43 days for hysterectomy [20]. Yet besides this report, limited information is available that is cancer site specific, especially beyond the major four cancers (i.e. lung, breast, colorectal and prostate).

Uterine cancer is the fourth most common cancer and the eighth most common cause of cancer death for women [21]. The main treatment for uterine cancer is hysterectomy. Of note, the 5-year survival rate for a woman diagnosed with an early stage uterine cancer (without spread) is 96%, whereas it falls to 16% if diagnosed after the cancer has spread more distantly [21]. Having a timely hysterectomy after uterine cancer diagnosis can potentially reduce the risk of cancer progression and spread. In Ontario, a report published at the onset of the Wait Time Strategy documents lengthy wait times for hysterectomies with 75% of surgeries in Ontario occurring at 11.3 weeks, significantly longer than the proposed recommendation of a wait within 6 weeks of diagnosis of uterine cancer [14]. Despite the documentation of problems in access to uterine cancer surgery, there has been no examination of wait times specific to uterine cancer surgery after 2000 either in Canada or internationally [22].

This study aims to examine the wait times from diagnosis to hysterectomy for uterine cancer from 2000 to 2009 in Ontario, Canada, where universal health coverage is well established. Our study period includes the period that the Wait Time Strategy was implemented. Thus, our results may help to determine the efficacy of the strategy, which can inform other jurisdictions that have implemented or are planning to implement similar strategies. We also investigate predictors of longer wait times, which can inform future cancer wait times policy.

2. Methods

2.1. Cohort selection

This study included all confirmed uterine cancer patients with a histopathological diagnosis of ICD-09 codes 179 or 182 in the Ontario Cancer Registry between April 2000 and March 2009. Patients must have had a hysterectomy after date of diagnosis (to ensure cancer diagnosis preceded surgery) and an accompanying Ontario Health Insurance Plan record. Cases with surgery wait times longer than 730 days were excluded from analysis since the extended wait time was hypothesized to be due to an extenuating or acute clinical reason.

2.2. Data sources

Data were extracted from various administrative data sets and linked for analysis. Patient diagnosis year, ICD-09 diagnosis code, confirmation type and date were taken from the Ontario Cancer Registry. All relevant data pertaining to surgery including date, surgeon speciality and hospital type were derived from the Canadian Institute for Health Information-Discharge Abstract Database, from 2000 to the end of March 2011. Ontario Health Insurance Plan records were used to confirm surgery date and surgeon specialty. Demographics

including age, income, rurality and region were gathered from the Registered Persons Database, the provincial vital statistics registry and the Statistics Canada 2006 census data. Region was defined according to Local Health Integration Network Regions. Since 2007, Ontario is divided into 14 health LHINs or health regions based on hospital referral patterns and hospital service areas. The LHIN region of patients was received as dummy codes to prevent patient identification. Rurality was defined, using postal code boundaries, as living in a community whose size was <10, 000 people, as per the census data. Income was reported as categorical data grouped into five quintiles. Diagnosis date was reported by year and age in categories to protect patient privacy.

2.3. Main outcomes

The primary outcome was wait time, defined as the number of days between the date of uterine cancer diagnosis by histology (day 0) and hysterectomy date. The primary analysis was to investigate the change in wait time by year, using calendar year of diagnosis as a reference date. Secondly, the effect of covariates on wait times longer than 6 weeks was examined. Our method of measuring uterine cancer wait times differs slightly from other reported analysis of wait times. The provincial cancer agency typically defines surgery wait time as decision to treat to surgical intervention. Unfortunately, this can exclude a number of different factors before decision to treat that can add to the "real" wait time experienced by the patient, including waiting for the specialist appointments, further radiologic investigations and time to decision to treat. These factors add days or weeks to the "real" wait time: one report stated that 40% of patients with high-risk diagnoses, including cancer and cardiac conditions, waited more than a month to see a specialist [23]. To account for this added "real time," Cancer Care Ontario adjusted the 4-week guideline originally outlined by the Ministry of Health to 6 weeks for all cancer surgery. For that reason, we used the Cancer Care Ontario's wait time of 6 weeks as a target wait in our current analysis [14].

2.4. Statistical analysis

Descriptive statistics were used to summarize patients, and the following covariates were examined as potential predictors of wait time: age, rurality, region, year of diagnosis, income, comorbidity, surgeon type, number of prior cancer diagnosis and surgery location. Rurality was defined using Statistics Canada 2006 census metropolitan areas and census agglomeration data. Comorbidities were scored using the Charlson comorbidity index [24]. Logistic regression analysis was used to examine each covariate as a univariable predictor of wait time greater than 6 weeks. Year squared was defined as a polynomial of degree 2, which allowed for investigation of the fit of year as a second-order approximation. As a test for sensitivity, a linear regression analysis was also performed, with wait time defined as a continuous outcome (with a logarithmic transformation applied for statistical normalization purposes). Results were similar, so only the logistic analysis results are reported for brevity. A statistically significant relationship was defined as a $p < 0.05$. The significance of wait time over time was analysed using one-way ANOVA with a Tukey's post hoc analysis of significance. A multivariable model was constructed using forward conditional selection method. All analyses were performed using SPSS (v20) [25].

3. Results

In total, 14,225 patients were identified in the Ontario Cancer Registry as having a diagnosis of uterine cancer (ICD-09:179, 182) between April 1, 2000, and March 31, 2009. After applying the exclusion criteria, the final analysis cohort was 9,330 uterine cancer patients in