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Quality indicators for testicular cancer: A population-based study

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ABSTRACT

Purpose: This study aimed at developing and measuring an indicator set to monitor the quality of testicular cancer care, to make comparisons over time and to support quality improvement for all practitioners and centres involved in the care of testicular cancer patients.

Methods: Quality indicators were identified from a systematic literature search and from the 2010 Belgian evidence-based clinical practice guidelines. The selection process involved an expert panel evaluating reliability, relevance, interpretability and actionability of each indicator. The quality indicators were pilot tested using the Belgian Cancer Registry (BCR) data linked with claims data for 1307 men with testicular cancer diagnosed between 2001 and 2006. The variability between centres was displayed using funnel plots.

Results: Of the 12 finally selected indicators, 5 were fully and 1 was partly measurable, while 2 indicators were measurable using proxy information. Five-year relative survival was 97%, 95% and 76% for pStage I–III, respectively. Overall 5-year survival slightly improved from 91% in 2001 to 94% in 2004. Between 2004 and 2006, 14 of 97 centres performed $\geqslant$10 orchidectomies. Large variability was found between centres. The nine centres with a 5-year observed survival below the lower limit treated less than 20 patients between 2001 and 2006.

Conclusions: The present study demonstrates the feasibility to develop a multidisciplinary set of quality indicators for testicular cancer. Using national cancer registry data linked to claims data, eight indicators were measurable, showing a mixed picture of the quality of care for testicular cancer patients in Belgium.

1. Introduction

Testicular germ cell tumours are relatively rare. In Belgium, 269 new testicular germ cell cancers were diagnosed in 2006 with an age-adjusted incidence rate of 5.2/100,000 person years.[1] Testicular cancer typically is a cancer of young men, with a peak age-standardised incidence rate of 20.9/100,000 person years in the age category 25–30 years in 2006.

The Belgian age-adjusted incidence rate is comparable to that in North-America (age-adjusted incidence rate 5.1/100,000 person years in 2008),[2] but lower than that in Western

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Europe (7.8/100,000 person years in 2008) and Northern Europe (6.7/100,000 person years in 2008).[2]

No published mortality or survival data specifically for testicular cancer are available for Belgium. However, in the period 2000–2001, the relative 5-year survival for testicular cancer was 95% in Flanders, the Northern part of the country.[3] These data are in line with those reported in the literature for other countries and regions. For example, in England and Wales, the relative 5-year survival rose from 91% between 1986 and 1990 to 97% between 1996 and 1999.[4] In the southern part of the Netherlands, the relative 5-year survival was 99% and 96% for patients with seminoma and non-seminoma germ cell cancer, respectively.[5]

The Belgian Federal Healthcare Knowledge Centre (KCE) recently issued publicly available evidence-based clinical practice guidelines (CPG) for the treatment of testicular germ cell cancer.[6] The main objective of the present study was to develop a set of process and outcome indicators to evaluate the adherence to these guidelines. In the absence of prospective data, the quality indicators were pilot tested on national cancer registry data linked with administrative claims data.

2. Methods

2.1. Indicator selection and definition

OVID Medline, the National Quality Measures Clearinghouse and websites of healthcare organisations (Agency for Healthcare Research and Quality, National Quality Measures Clearinghouse, Joint Commission, National Health Service, Clinical Indicators Support Team) were searched to identify published and validated quality indicators for testicular cancer. Furthermore, CPGs identified during the development of the Belgian testicular cancer guideline[6] were evaluated for included quality indicators. The searches were conducted in December 2009.

The list of quality indicators resulting from the literature search was complemented by quality indicators derived from the recommendations of the testicular cancer guideline.[6] To this end, most individual recommendations were translated in at least one quality indicator.

A preliminary list of 32 indicators, resulting from the literature search and addition of guideline-based indicators, was subjected to a formal assessment by six experts based on four criteria: reliability, relevance, interpretability and actionability. Measurability was no selection criterion *a priori*. Details of the selection process can be found in the Supplementary file.

For each selected quality indicator, the numerator and denominator (and their respective in- and exclusion criteria) were defined and the measurability was evaluated.

2.2. Data sources

To analyse the feasibility of the indicators, three national databases were used: the Belgian Cancer Registry (BCR) database, the Belgian population registry and a national administrative database containing claims data. More details on these databases and the linkage process can be found in the Supplementary file.

Patients with invasive testicular germ cell cancer (ICD-10 code C62) and an incidence date between 1st January 2001 and 31st December 2006 were selected from the BCR database ($N = 1337$).

2.3. Statistics

The majority of selected process indicators was binary (yes/no). These involved the definition of a numerator and denominator, and were described with percentages (N, n, %). One process indicator involved the number of times a certain procedure was performed, and was described with mean, median and standard deviation. All outcome indicators were time-to-event data, and involved the definition of a survival time until the event of interest, or until the end of follow-up. Kaplan–Meier survival functions were presented. Relative survival was computed as the ratio of observed survival to expected survival, using the Ederer II method, and based on Belgian mortality tables of 2006.[7]

A predefined algorithm was used to attribute each patient to one centre (see Supplementary file). The variability between centres was displayed using funnel plots.[8] More details are provided in the Supplementary file.

All analyses were performed with SAS 9.1.3 (SAS Institute, Cary, North Carolina, USA).

3. Results

3.1. Indicator measurability

From the original set of 32 quality indicators, 12 were finally retained (Table 1). Five of these were found to be measurable (TC1, TC4, TC6, TC7 TC9). One indicator (TC11) was only partially measurable because of the unavailability of specific administrative codes for CT and MRI imaging. Two indicators were measurable using a proxy indicator or proxy information. The relative survival (TC2, observed/expected survival) was calculated as an estimation of the disease-specific survival. For the calculation of the disease-free survival (TC3), in the absence of a specific code, recurrence was defined as the event of receiving new treatment at least 3 months after the first treatment.

The four remaining indicators were deemed not measurable. The most important reason for not being measurable was the absence of administrative codes (TC8, TC12) or the lack of specificity of the existing administrative codes (TC5, TC10).

3.2. Population characteristics

In total, the records of 1307 patients with invasive testicular germ cell cancer (97.7%) could be linked to the claims database. These patients constituted the population in the present study.

Table 2 provides an overview of the basic characteristics of the study population. The mean age of the sample was 34.5 years (SD = 12.6; range 0–95). The highest incidence of testicular germ cell cancer was found in the age category