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Optimal uptake rates for initial treatments for cervical cancer in concordance with guidelines in Australia and Canada: Results from two large cancer facilities

Yoon-Jung Kang [a,b,c,*], Dianne L. O'Connell [b,c,d,e], Jeffrey Tan [f], Jie-Bin Lew [a,b], Alain Demers [g,h], Robert Lotocki [g,i], Erich V. Kliewer [g,h,j], Neville F. Hacker [k], Michael Jackson [l], Geoff P. Delaney [m], Michael Barton [m], Karen Canfell [a,b]

[a] Prince of Wales Clinical School, UNSW, New South Wales, Australia[1]
[b] Cancer Research Division, Cancer Council NSW, New South Wales, Australia[2]
[c] School of Public Health, University of Sydney, New South Wales, Australia[3]
[d] School of Public Health and Community Medicine, UNSW, New South Wales, Australia
[e] School of Medicine and Public Health, University of Newcastle, New South Wales, Australia
[f] Royal Women's Hospital, Victoria, Australia
[g] Community Health Sciences, University of Manitoba, Winnipeg, Manitoba, Canada
[h] Epidemiology and Cancer Registry, CancerCare Manitoba, Winnipeg, Manitoba, Canada
[i] Division of Gynecologic Oncology, CancerCare Manitoba, Winnipeg, Manitoba, Canada
[j] Cancer Control Research, British Columbia Cancer Agency, Vancouver, British Columbia, Canada
[k] Royal Hospital for Women, New South Wales, Australia
[l] Prince of Wales Hospital, New South Wales, Australia
[m] Collaboration for Cancer Outcomes Research & Evaluation, Ingham Institute for Applied Medical Research, UNSW Australia, Sydney, New South Wales, Australia

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ABSTRACT

Background: Prior work estimating optimal treatment utilisation rates for cervical cancer has focused on radiotherapy or chemotherapy, using proportions of patients with clinical indications for specific treatment strategies which were obtained from the published literature.
Objectives: To estimate optimal uptake rates for surgery, radiotherapy, chemotherapy and chemo-radiotherapy for cervical cancer treatment in Australia and Canada, and to quantify the differences in the optimal and the observed treatment utilisation rates in a large cancer facility from each country.
Methods: A decision tree was constructed to reflect treatments according to guidelines and current practice (in 1999–2008) in each setting. Detailed patterns of care data from a large cancer facility in each country were obtained, and the observed stage distribution and proportions of patients with each clinical indication were used as inputs.
Results: The estimated overall optimal treatment rates for cervical cancer in Australia and Canada differed, largely due to the difference in the stage distribution at diagnosis in the two settings; 72% vs 54% with FIGO IA-IIA disease, respectively. The estimated optimal rates for surgery, radiotherapy, chemotherapy and chemo-radiotherapy in Australia were 63% (95% credible interval: 61–64%), 52% (53–56%), 36% (35–38%) and 36% (35–38%), respectively. The corresponding rates in Canada were 38%

Abbreviations: FIGO, International Federation of Gynecology and Obstetrics; MCR, Manitoba Cancer Registry; HR, hazard ratio; CI, confidence interval; CrI, credible interval; ECOG, Eastern Cooperative Oncology Group; NCI, National Cancer Institute; BCCA, British Columbia Cancer Agency; GMCT, Greater Metropolitan Clinical Taskforce; EBRT, External beam radiotherapy; CCMB, CancerCare Manitoba; RWH, Royal Women's Hospital; POWH, Prince of Wales Hospital; NSW, New South Wales.

* Corresponding author at: Cancer Screening Group, Cancer Research Division, Cancer Council NSW, 153 Dowling Street, Woolloomooloo NSW 2011, Australia. Tel.: +61 2 9334 1632; fax: +61 2 8302 3550.
E-mail addresses: yoonjung.kang@nswcc.org.au (Y.J. Kang), dianneo@nswcc.org.au (D.L. O'Connell), Jeff.Tan@thewomens.org.au (J. Tan), jiebin.lew@nswcc.org.au (J.B. Lew), alain.demers@phac-aspc.gc.ca (A. Demers), rlotocki@mymts.net (R. Lotocki), Erich.Kliewer@cancercare.mb.ca (E.V. Kliewer), neville.hacker@sesiahs.health.nsw.gov.au (N.F. Hacker), Michael.Jackson@sesiahs.health.nsw.gov.au (M. Jackson), Geoff.Delaney@sswahs.nsw.gov.au (G.P. Delaney), Michael.Barton@sswahs.nsw.gov.au (M. Barton), karen.canfell@nswcc.org.au (K. Canfell).
[1] Past affiliation of Kang, Lew and Canfell.
[2] Current affiliation of Kang, Lew and Canfell.
[3] Past affiliation of Kang.

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(36–39%), 68% (68–71%), 51% (49–52%) and 50% (49–51%), respectively. The absolute differences between the optimal and the observed rates were similar between the two settings; the absolute differences for chemotherapy and chemo-radiotherapy uptake were more pronounced (9–15% less than optimal) than those for surgery and radiotherapy uptake (within 5% of optimal).
Conclusions: This is the first study to use detailed patterns of care data in multiple settings to compare optimal and observed rates for all cervical cancer treatment modalities. We found optimal treatment rates were largely dependent on the overall stage distribution. In Australia and Canada, observed surgery rates, as measured in the two large cancer facilities, were similar to the estimated optimal rates, whereas radiotherapy, chemotherapy and chemo-radiotherapy appeared to be under-utilised.
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1. Introduction

Optimal rates of cancer treatment utilisation in a particular setting generally depend on the applicable stage-specific guidelines for treatment and the setting-specific stage-distribution of cancer at diagnosis. Initial treatment for cervical cancer performed with curative intent generally involves surgery and radiotherapy for early stage disease, and radiotherapy, chemotherapy and/or chemo-radiotherapy for locally advanced and regional disease. The most current international recommendations are encapsulated in guidelines published by the *International Federation of Gynecology and Obstetrics* (FIGO) [1]. Prior studies have estimated the optimal proportion of cervical cancer patients who should be treated with radiation [2–4] or chemotherapy [5]. However, no study has taken into account the full range of treatment types, nor explicitly compared the findings for optimal treatment rates across treatment modalities to observed data in different settings.

The aim of the current study was, firstly, to build on the prior work to integrate existing clinical evidence to estimate the optimal percentages of patients with cervical cancer who should, according to the best available evidence, receive each specific treatment modality as their initial therapy (i.e. within the first year after diagnosis). The second aim was to quantify differences in the optimal and the observed treatment utilisation rates, using data from patterns of care studies in large cancer facilities. Our study was performed in two settings, Melbourne, a metropolitan city in the Australian state of Victoria and the Canadian province of Manitoba. The results will assist health care decision makers to set delivery targets for specific treatment modalities for cervical cancer and to evaluate whether the level of current service is adequate to meet demand [6].

2. Materials and methods

2.1. Recommended treatments for cervical cancer

National guidelines for cervical cancer treatment were not identified for either Australia or Canada, but published treatment recommendations from collaborative working groups [7] and provincial guidelines [8], respectively, were available. These available guidelines do not differ substantially from each other and they are both similar to FIGO international guidelines for cervical cancer treatment and recommendations from other comparable countries [1,9,10]. Therefore, for the purpose of the current analysis, synthesised international evidence-based guidelines were derived, which reflected both the standard of care in each local setting and international standards since 1999 (Table 1).

2.2. Analysis of patterns of care data

For the purpose of the analysis, observed ‘‘current practice’’ was defined as treatment over the years 1999–2008. Patient performance status was considered in the evaluation, and if apparently sub-optimal treatments were observed for patients with poor performance status (Eastern Cooperative Oncology Group [ECOG] score 3–4) then treatment was assessed as being in accordance with guideline treatments for the purposes of this evaluation. This was done in order to take into account, as far as possible, the potential impact of co-morbidities on the treatment decision apparently deviating from the evidence-based guidelines.

Data from patterns of care studies performed in large cancer facilities in Australian and Canadian jurisdictions were analysed to provide information about actual treatment patterns and the proportions of patients with clinical indications for various treatment strategies in each setting. With respect to current management practice in Australia, data from the Royal Women's Hospital (RWH) were used for patients who received their first treatment for diagnosed cervical cancer during the period 1999–2008. The RWH is an area-based tertiary referral centre in Melbourne, a metropolitan city in the Australian State of Victoria. During the period, 385 patients were treated at the centre, representing 25% of all cervical cancer patients diagnosed in Victoria during the same period. These data are not population-based, but were the only FIGO stage-specific data available since population-based cancer registries do not collect information on FIGO stage.

Data on current practice in Canada were obtained for patients diagnosed in the period 1999–2008 who were identified from the population-based Manitoba Cancer Registry (MCR) [11]. Detailed information on stage and treatment were obtained by combining the MCR (for the period 1984–2008) and a database derived from chart reviews (for the period 1984–1999); both the MCR and the charts were maintained by CancerCare Manitoba. The Manitoba data are population-based, and all cancer patients are referred to CancerCare Manitoba for treatment. Of the 452 cervical cancer patients who were identified from the MCR during the period 1999–2008, FIGO stage was recorded for 369 patients (75%). For early stages (FIGO IA, FIGO IB-IIA with small lesions), the proportions of patients with lymphovascular space invasion, negative surgical margins or lymph node involvement and the associated treatment patterns were only available for those who were diagnosed in the period 1990–2003. The recommended treatments, management practice and stage-specific survival for these early stages of the disease did not significantly change over the period 1990–2008. Therefore, it was expected that the use of the data from the earlier period for early stage disease would not affect the results substantially. Hence, for the current analysis, data for 542 patients were used: these include 369 cases diagnosed in 1999–2008 who had complete records on FIGO stage, treatment and lesion size (for FIGO IB-IIA stage disease) and 173 cases with early stage disease (FIGO IA, FIGO IB-IIA with small lesions) diagnosed in 1990–2003 who had complete records on lymphovascular space invasion, negative surgical margins or lymph node involvement.

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