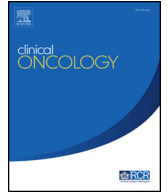




Contents lists available at ScienceDirect

Clinical Oncology

journal homepage: www.clinicaloncologyonline.net

Original article

Cancer Deaths due to Lack of Universal Access to Radiotherapy in the Brazilian Public Health System

L.C. Mendez^{*}, F.Y. Moraes[†], G. dos S. Fernandes^{‡§}, E. Weltman^{¶||**}^{*} Sunnybrook Health Sciences Centre, University of Toronto, Toronto, Canada[†] Princess Margaret Hospital, University of Toronto, Toronto, Canada[‡] Hospital Sírio-Libanês, Brasília, Brazil[§] Sociedade Brasileira de Oncologia Clínica, Brazil[¶] Hospital Israelita Albert Einstein, São Paulo, Brazil^{||} Faculdade de Medicina da Universidade de São Paulo, São Paulo, Brazil^{**} Sociedade Brasileira de Radioterapia, Brazil

Received 4 May 2017; received in revised form 22 August 2017; accepted 29 August 2017

Abstract

Aims: Radiotherapy plays a fundamental role in the treatment of cancer. Currently, the Brazilian public health system cannot match the national radiotherapy demand and many patients requiring radiotherapy are never exposed to this treatment. This study estimated the number of preventable deaths in the public health system if access to radiotherapy was universal.

Materials and methods: Incidence rates for the year 2016 provided by Instituto Nacional de Cancer were used in this analysis. The number of untreated patients requiring radiotherapy was obtained through the difference between the total number of patients requiring radiotherapy and the total amount of delivered radiotherapy treatments in the public health system. The number of deaths for the three most common cancers in each gender due to radiotherapy shortage was calculated. Initially, the total number of patients per cancer type was divided in stages using Brazilian epidemiological data. Subsequently, previously published tree arm diagrams were used to define the rate of patients requiring radiotherapy in each specific clinical setting. Finally, the clinical benefit of radiotherapy in overall survival was extracted from studies with level 1 evidence.

Results: Over 596 000 cancer cases were expected in Brazil in 2016. The public health system covers more than 75% of the Brazilian population and an estimated 111 432 patients who required radiotherapy in 2016 did not receive this treatment. Breast, colorectal and cervix cancers are the most frequent malignant tumours in women and prostate, lung and colorectal in men. The number of deaths due to a radiotherapy shortage in the year 2016 for these types of cancer were: (i) breast: 1011 deaths in 10 years; (ii) cervix: 2006 deaths in 2 years; (iii) lung: 1206 deaths in 2 years; (iv) prostate, intermediate risk: 562 deaths in 13 years; high risk: 298 deaths in 10 years; (v) colorectal: 0 deaths, as radiotherapy has no proven benefit in overall survival.

Conclusion: Thousands of cancer patients requiring radiotherapy do not have access to this treatment in the Brazilian public health system. The shortage of radiotherapy has a significant detrimental effect on cancer survival; over 5000 deaths would probably be prevented in the most common cancer types if radiotherapy access was universal.

© 2017 The Royal College of Radiologists. Published by Elsevier Ltd. All rights reserved.

Key words: Epidemiology; health economics in oncology; oncology in low/middle income countries

Introduction

Brazil is the largest and most populated country in South America, with over 206 million inhabitants [1]. This federal

republic promulgated a new constitution in 1988. In this constitution, access to healthcare is defined as ‘a civilian right and state obligation’ [2]. In this same year, a unified public healthcare system (Sistema Único de Saúde) was elaborated based on three major principles: universality, equity and integrality [3].

Oncological diseases are a major cause of mortality worldwide and rank as the second most common cause of

Author for correspondence: L.C. Mendez, Sunnybrook Health Sciences Centre, 2075 Bayview Avenue, Toronto, Ontario M4N 3M5, Canada. Tel: +1-416-480-7826; Fax: +1-416-480-6002.

E-mail address: lucascastro.mendez@sunnybrook.ca (L.C. Mendez).

<https://doi.org/10.1016/j.clon.2017.09.003>

0936-6555/© 2017 The Royal College of Radiologists. Published by Elsevier Ltd. All rights reserved.

Table 1
Absolute and proportional number of cases in Brazil for the year of 2016

Cancer type	Number of cases	Proportion of cases in Brazil (%)
Prostate	61 200	10.2
Breast	57 960	9.7
Colorectal	34 280	5.7
Lung	28 220	4.7
Cervix	16 340	2.7

death in Brazil. In 2014, the National Institute of Cancer from Brazil (Instituto Nacional de Cancer; INCA) acknowledged that 194 170 deaths were attributed to oncological causes [4]. It is noteworthy that both the incidence and the number of deaths associated with cancer are in ascendance in Brazil [4].

Radiotherapy plays a fundamental role in cancer treatment plans, acting both as a key curative and as a palliative treatment. However, similar to many undeveloped countries [5], Brazil faces a dearth of access to radiation treatment because of a lack of well-trained personnel, fair reimbursement and enough treatment units [6]. In this sense, the shortage of linear accelerators (linacs) can be singled out as an important culprit in this non-ideal healthcare situation. According to recommendations from the International Atomic Energy Agency [7], each linac should deliver on average 450 new courses of radiation therapy per year. Brazil has 357 currently registered linacs, resulting in only 50.8% of the required amount of equipment, if the Brazilian cancer figures and the rate of radiotherapy need described by Zubizarreta *et al.* [8] are considered.

The non-universal access to healthcare may effectively be an unconstitutional act and lead to an increased number of deaths within an oncological setting. In this regard, this study aimed to estimate the number of preventable oncological deaths in the public health system if access to radiotherapy were universal for the most common cancers in Brazil.

Materials and Methods

Incidence rates estimated by INCA for the year 2016 were used in this study [9]. The three most common cancer types

from each gender were evaluated, which represents 33.2% of new cancer cases in Brazil (Table 1). The number of preventable deaths was calculated in the scenario where radiation therapy access was universal to patients in the Brazilian public health system. The following paragraphs specify the stepwise methodology used by this study and Figure 1 illustrates it.

According to the Brazilian Ministry of Health, the Brazilian public health system encompasses 75.32% of the population's healthcare [10]. The remaining population relies on private healthcare assistance. INCA states that breast, colorectal and cervix cancers are the most frequent malignant tumours in women and prostate, lung and colorectal in men. Non-melanoma skin cancers were not considered in this analysis. The number of oncological patients in the public health system was estimated by assuming a homogeneous distribution of cancer cases among the Brazilian population, with no distinction between public and non-public health services. Thus, the number of patients taken care by the public health system was considered to be 75.32% of the absolute number of new cases of cancer in Brazil, for each type of oncological illness.

No recent study has evaluated the comprehensiveness of access to radiotherapy in the Brazilian public health system. In this study, the non-universal access to radiation treatment was estimated by comparing the number of treated patients in the public health system in 2015 (corrected by 3.5%: relative increase in cancer cases in 2016) and the ideal number of oncological patients treated with radiotherapy in the Brazilian public health population. Previously, Zubizarreta *et al.* [8] have estimated that 53.27% of the new cancer patients in South America have an indication of radiotherapy throughout their oncological care. This rate was used to calculate the number of patients with cancer diagnosed in 2016 who required radiotherapy at some point during the course of the disease.

Data from INCA does not detail oncological staging. Therefore, this information was investigated through platforms of scientific search, such as Medline, EMBASE and Scielo, by using the following key words: incidence, demographics, epidemiology, breast, cervix, lung, prostate, colorectal, cancer, Brazil and Brazilian. Whenever several sources were available, data from the most recent and

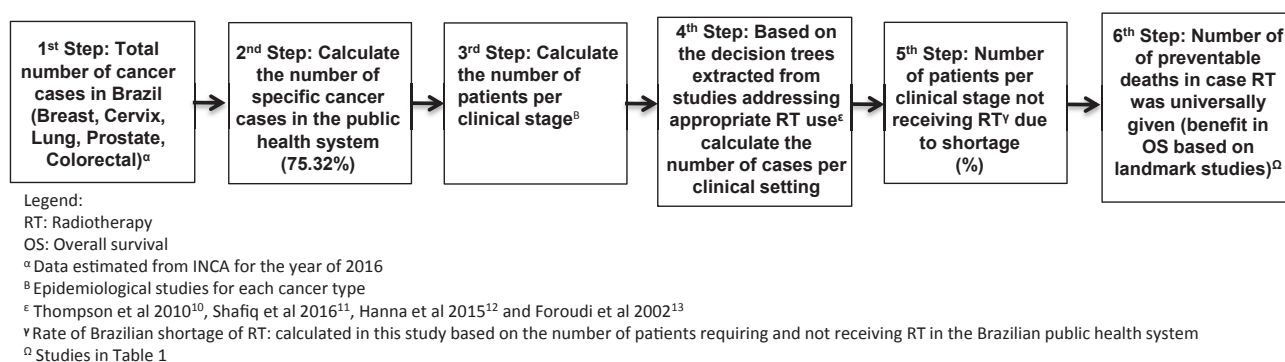


Fig 1. Flow chart of the methodology used in this study to calculate the number of preventable deaths in the Brazilian public health system if access to radiotherapy was unrestricted.

Download English Version:

<https://daneshyari.com/en/article/8786238>

Download Persian Version:

<https://daneshyari.com/article/8786238>

[Daneshyari.com](https://daneshyari.com)