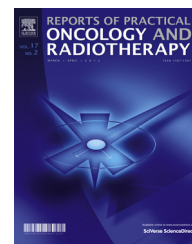


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Original research article

Evidence based radiation oncology with existing technology



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ABSTRACT

Aim: To assess the real contribution of modern radiation therapy (RT) technology in the more common tumoral types in Central America, Caribbean and South America.

Background: RT is an essential tool in the management of cancer. RT can be either palliative or of curative intent. In general, for palliative radiotherapy, major technologies are not needed. **Materials and methods:** We analyzed the contribution of RT technology based on published evidence for breast, lung, gastric, gallbladder, colorectal, prostate and cervix cancer in terms of disease control, survival or toxicity with especial focus on Latin America.

Results: Findings indicate that three dimensional conformal radiation therapy (3D RT) is the gold standard in most common type of cancer in the studied regions. Prostate cancer is probably the pathology that has more benefits when using new RT technology such as intensity modulated radiation therapy (IMRT) versus 3DRT in terms of toxicity and biochemical progression-free survival.

Conclusions: In light of the changes in technology, the ever-increasing access of developing countries to such technology, and its current coverage in Latin America, any efforts in this area should be aimed at improving the quality of the radiotherapy departments and centers that are already in place.

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1. Background

The radiotherapy (RT) is an essential tool in the handling of cancer. From the discovery of the X-rays, the RT has evolved very much as for the comprehension of his functioning, justification and form of use, generating articles of high quality investigation. During the natural history of the cancer, about 50% of the patients will need RT during the course of his illness, this needs changes in percentage, depending on the

tumor type that has the patient, his stage and form of presentation and of the population profile in which we are.¹

If we analyze the region of Central America, Caribbean and South America, the cancer is the second cause of death,² having 75% of the countries programs of alertness of cancer. However, only 25% have programs of screening of cervix cancer.² In the zone of the Caribbean there is one radiotherapist and 1.4 machines of RT every 1.6 million persons versus 9 radiotherapists and 6.4 machines every 1.6 million persons in the developed countries.² In 2008 in

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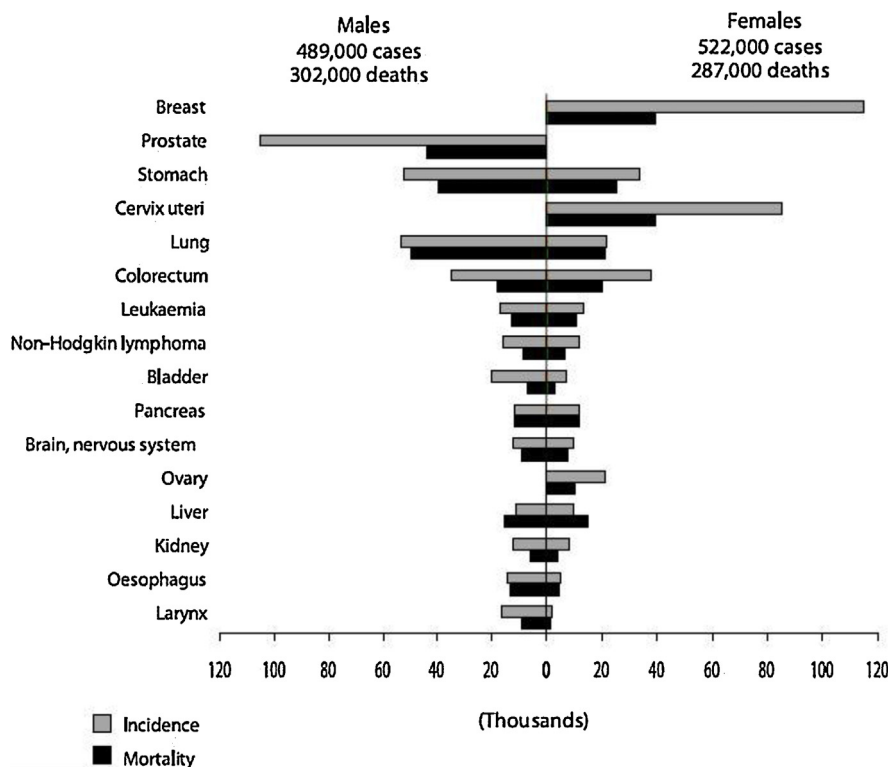


Fig. 1 – Incidence and mortality of cancer in Southern America.

the region of Central America, Caribbean and South America there was an incidence of cancer of 1,011,000 of cases (4,89,000 men versus 5,22,000 women) and a mortality of 5,89,000 cases (3,02,000 men versus 2,87,000 women).² The most common cancer incidences in men, in decreasing order, are prostate, lung, gastric and colorectal, being the higher mortality for lung cancer, followed by prostate, gastric and colorectal (Fig. 1). The most common incidences in women, in decreasing order, are breast, cervix, colorectal, gastric and lung, being the most higher mortality for breast cancer, continued of cervix, gastric, lung and colorectal cancer (Fig. 1).

For the particular case of Chile,³ the most common cancer incidences in men, in decreasing order, are prostate, gastric, lung, colon and gallbladder, being the higher mortality for gastric cancer, followed by prostate, lung, gallbladder and colon (Table 1). The most common incidences in women, in decreasing order, are breast cancer, gallbladder, cervix, gastric, colon and lung, being the higher mortality for gallbladder cancer, followed by breast, gastric, lung, cervix and colon (Table 1).

RT can be either palliative or of curative intent. In general, for palliative radiotherapy, major technologies are not needed. The objective of this review is to assess the evidence-based contribution of the technology in the most common type of cancers in the region of Central America, Caribbean and South America, with emphasis on the Chilean population.

2. Evidence based radiation oncology according to location

2.1. Breast cancer

The RT has a clear roll in the handling of in situ and infiltrative breast cancer.⁴

We know that the RT in the ductal in situ carcinoma, on having been added to the conservative surgery, diminishes the ipsilateral recurrence, with a benefit of 15.2% to 10 years ($p < 0.00001$),⁵ without a benefit in the overall survival or some increase of mortality for cardiac and pulmonary toxicity to 10 years ($p = \text{NS}$).⁵ For infiltrative breast carcinoma, the RT, on having been added to the conservative surgery, gives a benefit in overall survival to the specific deaths caused by breast cancer of 3.8% to 15 years ($p = 0.0001$).⁶ On having been added to the entire Mastectomy, in infiltrative breast carcinoma, in patients N (-), it gives a detriment in overall survival to the specific deaths caused by breast cancer of 3.6% to 15 years ($p = 0.01$) and an increase in the incidence of counter side cancers of breast in a 1.8% to 15 years ($p = 0.002$).⁷ But in patients N (+), the RT post entire mastectomy, in infiltrative breast cancer, gives a benefit in overall survival to the specific deaths caused by breast cancer of 5.4% to 15 years ($p = 0.0002$).⁷

The problem is that the RT in infiltrative breast cancer, produces an increase in the mortality in the deaths not related to breast cancer of 0.5% and 1.3% to 10 and 15 years

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