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Radiotherapy utilization in developing countries: an IAEA study

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Background

The planning and monitoring of national radiotherapy services requires a thorough knowledge of the national cancer epidemiology profile, the radiotherapy utilization (RTU) rates and a realistic future projection of these data. Previous studies have established RTU rates in high income countries.

Methods

The IAEA conducted a project to investigate the optimal and actual RTU rates in 9 middle-income countries. The aim was to estimate the actual RTU rate and compare it with the optimal RTU in each country to estimate the gaps in service provision. The countries selected for the study were Costa Rica, Ghana, Malaysia, Philippines, Romania, Serbia, Slovenia, Tunisia and Uruguay.

Optimal RTU (oRTU) was determined following the epidemiological evidence-based method using cancer incidence data from Globocan-2012 and radiotherapy indication trees from the CCORE group. The actual RTU (aRTU) rates were calculated dividing the total number of new notifiable patients treated with radiotherapy in 2012 by the total number of cancer patients diagnosed in the same year. An analysis of the characteristics of patients and treatments in a series of 300 consecutive patients receiving RT shed light on the particular patient, diseases profile and techniques used in the participating countries.

Results

The calculated median oRTU rate for the group of 9 countries was 52% (Table 1). There was a difference of 9% between the lowest oRTU in Costa Rica (47%) and the highest in Tunisia (56%). This was due to variations in the incidence of some cancer types treatable with radiotherapy that have a lower incidence in Costa Rica than in Tunisia.

The aRTU rate for the 9 countries was a median of 28% with a range from 9% (Ghana) to 46% (Tunisia). The results show that the actual proportion of cancer patients receiving RT is lower than the optimal RTU with a rate difference between 10% (Tunisia) and 42.7% (Philippines). The median percent unmet need was 47% (range 18-82.3%).

Patient's mean age at diagnosis was 55 years and the gender distribution m/f was 36/64%. Mean delay caused by the medical system was 280 days, and mean delay caused by internal center's procedures was 73.5 days. 67% of patients were treated with palliative, and 33% with curative intent. A mean 54% of patients had previous surgery and 21% received concomitant chemo-radiotherapy.

From the RT technique viewpoint and out of the total of 2549 patients analyzed, 49.1% were treated with 2D, 42.6% with 3D, 3.2% with IMRT and 4.9% with other techniques. 16% of patients were treated with hypofractionated regimens. The median re-irradiation rate was 11% and the most frequent irradiated sites were: pelvis (27.3%), breast (26.8%), head-and-neck (12.8%), CNS (11.8%) and "other"(11.1%).

Conclusions

The optimal RTU rate in this group of middle-income countries did not differ significantly from that previously found in high income countries. The actual RTU rates were consistently lower than the optimal, ranging from 9% to 46%. The gap between optimal and actual RTU rates in these 9 middle-income countries as well

as the calculated percent of unmet need could be explained by obstacles in access to existing RT services and other factors.

National radiotherapy services should be rationally planned in order to improve access to RT.

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