EXPERIENCE IN TOTAL BODY IRRADIATION IN ONE INSTITUTION
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Introduction
Total body irradiation (TBI) combined with intensive chemotherapy plays an important role in conditioning patients with hematologic malignancies before bone-marrow transplant (BMT). The goal of TBI in this setting is threefold: destroying residual neoplastic cells, clearing the host marrow to allow repopulation with the donor marrow cells, and providing a sufficient degree of immunosuppression to avoid allograft rejection by immunologically active cells in the host. This is the reason why in 1994 the technique of total body irradiation in the Radiation Therapy Department of “Prof. Dr. Juan P. Garrahan” Children’s Hospital was developed. The objective of this work is to analyze the dosimetric results of TBI and evaluate the results of BMT in patients undergoing allogeneic BMT with acute lymphoblastic leukemia.

Material and methods
Between November 1994 and January 2006, 45 eligible patients (pts) with acute lymphoblastic leukemia in first or greater remission were analyzed. Thirteen (29%) pts were female and 32 (71%) were male. The median age was 9 years (r 2-17). Twenty-three (51%) pts with ALL were in 1st. remission, 17 (38%) in 2nd. remission and 5 (11%) were in 3rd. remission. Forty-four patients were transplanted with grafts from HLA-identical family-related donors while one with umbilical cord. The pretransplant conditioning regimen included cranial and testis boost, TBI and chemotherapy. The doses of radiation for cranial and testis was 6 Gy. TBI was delivered in every case before conditioning chemotherapy with six equally divided fractions over 3 days, twice a day, with a 12Gy as a total dose, and after TBI chemotherapy with etoposide. During each TBI session, the dose was monitored in vivo using semiconductor diodes or ionization chamber placed directly on the central axis (pelvis) and off-axis anatomic sites (head, lungs and legs). In our case we use the laterolateral compensator. The objective is to produce a uniform dose throughout total body regions to within ±10% of the dose specified at the pelvis.

Clinical results
The average of the follow-up was 39month (range 1-158 month). Of 45 patients analyzed, 19 patients died and 26 are alive (25 are alive free of disease and 1 is in relapse), with 52% disease-free survival at 158 month, being relapse the most common cause of death (12 pts).

Dosimetric results
All measurements were analyzed in 40 pts. The percentage relative error, that is to say, the difference in percentage between the dose measured with respect to the prescribed one in the different points, is observed in the following figures

Conclusions
The technique of TBI in 12 years of experience has demonstrated, based on the dosimetric aspect, to be effective in the delivery of prescribed dose. The BMT in children with ALL remains an important treatment option for the patients in second remission or in ALL-high risk after first remission.