I. Introduction:

- Rhabdomyosarcoma (RD) is the most common soft tissue sarcoma of childhood; it tends to occur in head and neck area, bladder, vagina, and in or around the prostate and testes.
- To choose adequate criteria of cell radio-sensitivity and to calculate the characteristic parameters for comparative radiation studies, a survival curve is needed.
- A Cell survival curve describes the relationship between the radiation absorbed dose and the proportion of cells that survive.

II. Objectives:

- To determine the intrinsic radio sensitivity of the RD cells type.
- To determine the parameters related to survival curve used for the calculations of tumor cell kill in radiotherapy of pediatric tumors, of the type of RD sarcoma.

III. Methods:

- RD cell lines produced by ATCC were used under their guidelines and recommended media.
- Clonogenic survival assay was used to determine the surviving fractions of the irradiated RD cell lines.

IV. Results:

![Image of survival curve graphs]

Fig. 1: Shape of survival curve for RD cells exposed to X-ray. A. The curve is described by the single-hit multi-targets model (D_0=3.6 Gy and n=18), B. The curve is described by linear quadratic model (α/β = 9 Gy).

V. Discussion and Conclusions:

- The mean lethal dose D_0 is 3.6 Gy, the quasi-threshold dose D_q is 9.2 Gy, and the extrapolation number (n = 18) are reflect the ability of the RD cells to repair sub-lethal radiation damage.
- α/β ratio: Cells displaying α/β ratio (9 Gy) indicate that the conventional dose per fraction of 2 Gy should provide therapeutic gain with an increased probability of tumor cure (TCP) and sparing of late-responding normal tissues (NTCP).
- SF<sub>4</sub> value: The high value of SF<sub>4</sub> (0.79%) correlates with the low clinical radiosensitivity of RD cell lines.
- Mechanism of death: Mitotic death is dominant in this type of RD cells.