An audit of clinical profile and radiation protocol deviation of paediatric patients in India

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Introduction
Radiation therapy is a critical part of multimodality treatment for several pediatric cancers.

To ensure quality, it is pertinent to deliver radiation at right time and to complete it without interruption.

This is an under-researched area in developing countries where most of the childhood cancer cases occur.

In this retrospective study we describe the profile of children undergoing radiation and analyze deviation from timeliness of radiation.

Material & methods
Data on all children with cancer who completed radiation treatment at our institute from Jan 2009 to Dec 2018 was retrieved. Demographic and clinical parameters were studied. We looked at four specific metrics

1. Time taken to complete radiation vs time it should have taken assuming that radiation was delivered 5 days a week. A significant deviation means: time taken > 10% expected time.
2. Time interval from surgery to start of radiation (in CNS tumors only).
3. Dosage and 4. Fields

Results
Total 62 patients were evaluated, ~60% patients were male.

Median age was 12 years (range 2-20 years).

CNS tumors (37%), Leukemias (23%) and sarcomas (16%) were the most common cancer groups.

87% patients received radiotherapy with curative doses.

Most of our patients received adjuvant radiotherapy, only one patient received neoadjuvant radiotherapy. Deviations observed are as follows:

- 22.6% for timeliness in starting
- 5.5% for dosage
- 18.9% for duration
- 1.9% for fields

Modality was IMRT 66%, IGRT 24% and 3DCRT 10%.

In CNS tumors, median time period from surgery to start of radiation was 35 days. Deviations observed for tumors are as follows:

- 35% for timeliness in starting
- 10% for dosage
- 20% for duration
- 0% for field

Discussion
Data from various studies suggest on time delivery of radiation and unscheduled gap can reduce local control.

Patients are not referred for radiotherapy in time. Lack of knowledge and fear of side effects are primarily responsible for this delay.

For medulloblastoma, adjuvant RT should ideally begin preferably within 4-weeks, but definitely within 6-weeks of surgery.

The overall treatment time of fractionated course of radiotherapy should preferably not exceed 50 days.

Our study reported that in 19% of total patients and 20% of CNS tumors patients could not complete their treatment within time due to poor compliance. There is delay in starting radiotherapy in 35% patients of CNS tumors.

Hence it is strongly recommended that following surgery or chemotherapy, children should be referred earliest to radiation oncologist to plan and execute radiation in time.

Lack of Trained paediatric oncologists and paediatric radiation oncologists is also a major concern.

Conclusion
A majority of childhood cancer patients at our centre have significant deviation in the start and completion of scheduled radiation treatment.

Improved education and training, better communication with patients and families, and (among health care professionals) better coordination of care (to reduce patient wait times and inconvenience) can increase compliance and local control.

References