ONCODAILY MEDICAL JOURNAL

abstract

Radiation Therapy to Metastatic Sites Among Patients with High-Risk Neuroblastoma in First-Line Therapy

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doi.org/10.69690/ODMJ-018-0425-510

SIOP ASIA 2025
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Radiation Therapy to Metastatic Sites Among Patients with High-Risk Neuroblastoma in First-Line Therapy

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DOI: *https://doi.org/10.69690/ODMJ-018-0425-510*

Introduction: Radiation therapy (RT) is one of the components of local control of the primary tumor in patients with high-risk (HR) neuroblastoma (NB). Irradiation of residual metastatic lesions after completion of the induction therapy is not a part of the standard treatment protocol in primary patients with HR NB and requires further study.

The aim was to investigate approaches to RT for residual single metastatic site after induction therapy among patients with HR NB as part of the consolidation phase of first-line therapy.

Methodology: 11 patients with high-risk NB were included in the retrospective monocentric study for the period from 01.2012 to 12.2023. Patients received therapy according to the modified GPOH protocol NB2004. A single metastatic focus which was preserved after induction chemotherapy and detected by scintigraphy with 123-I-MIBG or CT/MRI was the indication for RT.

Results: The median age was 31.9 months (range 9.4-128.6). All patients were initially with stage 4 disease (one patient had metastatic focus in the orbit without detection of the primary tumor). MYCN amplification was detected in 4/11 (36%) cases. All patients achieved a partial response after induction therapy. In all cases, only one metastatic site was irradiated. 2/11 patients received radiation to both the primary tumor and metastatic focus.

10/11 were irradiated to skeletal bone metastasis, 1/11 - to distant lymph nodes. 7/11 sites received 21 Gy in 14 fractions. The median follow-up was 44 months (range 13-101). Only 1 out of 11 patients receiving metastatic site RT experienced relapse in the irradiated field 24 months later. The 3-year relapse-free survival (RFS) and overall survival (OS) were 54% and 80%, respectively.

Conclusion: Radiation therapy may be an effective method of local control in HR NB patients with oligometastatic disease when single metastatic lesion persists after induction chemotherapy.