previously suggested grading cutoffs were used. Additional patient-reported outcome (PRO) instruments included the EORTC overall health and quality of life questions and the FACIT-TS-G (treatment satisfaction). Multiple imputations by chained equations using predictive mean matching were used for incomplete responses. Spearman's rank correlation coefficient, Kruskal-Wallis testing, and linear regressions were used to measure associations.

Results: A total of 53 patients were identified who had completed PRO surveys between May 2021 and December 2022. Median COST was 25 (range 0-44), with lower scores indicating greater financial toxicity. 49% reported grade 0 financial toxicity (COST ≥26), 32% had grade 1 financial toxicity (COST 14-25), 19% had grade 2 financial toxicity (COST 1-13), and 6% had grade 3 financial toxicity (COST = 0). Overall, cancer caused financial hardship among 45%. Higher COST was moderately associated with higher overall health (rho = 0.36, p = 0.02) and weakly associated with higher QOL (rho = 0.28, p = 0.07). From a demographic standpoint, median area family income from census tract data was $98,598 (range $32,303-$190,833), and higher income was associated with higher COST (rho = 0.47, p<0.001). Having Medicare (beta = 13.8, p = 0.003) or private (beta = 13.5, p = 0.001) coverage (rather than Medicaid) were associated with less financial toxicity, whereas having an underrepresented minority background (beta = -13.2, p<0.001), or having a non-English language preference (rho = 0.40, p = 0.003) were associated with greater financial toxicity. Median time from diagnosis was 12.9 mo, and 40% of patients had ≥2 prior systemic therapies. The median RT dose was 25 Gy (range 4-45 Gy). The most common irradiated sites included spine (24%), non-spine bones (21%), brain (18%), and lung/mediastinum (18%). COST was not associated with number of prior systemic therapies (p = 0.31), RT dose (p = 0.83), RT technique (p = 0.86), or treatment satisfaction (p = 0.34). Median follow up was 8.0 months, and median 6-month survival was 83% (95% CI 73%-95%). Inferior OS was associated with more prior systemic therapies (HR 3.43, p = 0.03), but not with COST (HR 1.01, p = 0.67).

Conclusion: Financial toxicity was seen in approximately half of patients receiving palliative RT. Patient-reported overall health, Medicaid coverage, and area income correlated well with financial toxicity, but the investigated clinical characteristics did not. This supports the hypothesis that financial toxicity is common and a unique factor that should be measured in cancer patients.

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2504

Patterns of Independence in Adolescent/Young Adult (AYA) Survivors of Childhood Cancer Having Received Radiotherapy (RT)

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Purpose/Objective(s): AYA cancer survivors are at risk for missed care opportunities due to transitions of care and movement towards independence. This study was undertaken to evaluate steps towards independence of AYA survivors voluntarily using a free, Internet-based tool for creation of survivorship care plans (SCP).

Materials/Methods: A free, publicly accessible tool, Smart-ALACC (Smart Adult Living after Childhood Cancer) was made available on Oncolink.org. Analysis of convenience sample frame was performed with IRB approval.

Results: From 12/2017-12/2022, 676 AYA survivors utilized the tool; 55% (372) identified as female. Most (75%, 506) were white, 7% (48) Black, 7% (46) Asian, 6% (42) Hispanic, 5% other/ mixed race. Median age was 20y (R <16 − 46y) and median age at diagnosis was 11 y (R <1y − 21). Most common diagnoses were leukemia (31%, 212), lymphoma (21%, 140), sarcoma (14%, 95), CNS (9%, 54), and neuroblastoma (5%, 37). 311 pts (46%) reported having had RT, most commonly brain (PB) (19%, 60), "mantle" (14%, 43), craniospinal (CSI) (12%, 36), total body irradiation (TBI) (11%, 34), and head/ neck (8%, 26). Most (92%, 619) denied recurrence /secondary malignancy. Users reported being students (64%, 434) or working (24% (163)) full-time (20%) or part-time (4%); 4% (25) were neither. Most reported living with parents (71%, 482), 14% (92) with a partner/ spouse, 7% (46) alone, and 4% (30) with a roommate. Most reported using parental insurance (54%, 368), while 24% (163) had their own private insurance, 7% (49) public, and 2% uninsured. Of 466 users 18+ (466), more were employed (34%, 155, p = 0.04), living separately from parents (40%, 168, p < 0.001), and had independent insurance (52%, 184, p = 0.03). Of users 23 + (244), 141 (57%) were being employed (p < 0.001), 83% (153) living separately from parents (p < 0.001), and 165 (67%) had independent insurance (p < 0.001). Among users age 23+, survivors who had received brain RT (CSI, brain, or TBI) were less likely to live separately parents or with a spouse/ partner (p < 0.001), but equally likely to be employed (Table 1).

Conclusion: AYA survivors choosing to use a SCP tool have diagnoses reflective of diagnostic patterns in pediatric oncology; many have had RT expected to be associated with cognitive and developmental late effects. Despite this, trends towards employment and independence were evident in young adult population compared to adolescent; somewhat less so in survivors having had brain RT. These data suggest that AYA survivors display independence from parents and require population directed survivorship support; future efforts should aim to include a more diverse body of users.

Abstract 2504 − Table 1: Qualities of independence in childhood cancer survivors aged 23+ based on radiation received

Radiation Received	Living separately from parents	Living with partner/spouse	Employed	Independent insurance
None, n = 125	67% (84)	39% (41)	60% (75)	66% (82)
Non-CNS, n = 73	81% (59)	43% (31)	54% (39)	73% (53)
Brain or TBI, n = 48	52% (25)	21% (10)	58% (28)	64% (31)
P	0.035	< 0.001	NS	NS

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2505

Hyperbaric Oxygen Therapy Attenuates the Whole Brain Radiotherapy-Induced Progressive Cognitive Dysfunction via Promoting Hippocampal Neurogenesis in Rats

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Purpose/Objective(s): Radiation therapy is a widely used brain tumor treatment; however, it can cause significant effects on the central nervous system, including neurogenesis impairment, microglia activation, and oxidative stress, leading to brain injury. Hyperbaric oxygen therapy (HBOT) has been shown to benefit various neurological conditions, but its effect on radiation-induced brain injury damage remains limited. This study aims to investigate the impact of HBOT on radiation-induced neurogenesis impairment, microglia activation, and lipid peroxidation levels, and also aim to assess the therapeutic potential of HBOT on preventing irradiation-induced brain injury.

Materials/Methods: This study used a rat model that delivered different doses (2, 4, 10 Gy) of whole-brain radiation therapy (WBRT). The rats were divided into two groups: one received HBOT, and the other acted as the control (normal baric air, NBA) group. HBOT was performed on day 8 of post-radiation once per day for five consecutive days a week for four weeks. The rats were subjected to different irradiation dosages as described, followed by administration of 5-chloro-2'-deoxyuridine (CldU) immediately at day 0 or day 0 to day 7 and 5-iodo-2'-deoxyuridine (IdU) at day 2 or day 14 to day 28 following WBRT to detect serially replicating cells. Then the rats underwent behavioral tests to assess their cognitive and motor function every week. Brain tissues were collected and analyzed to evaluate neurogenesis, microglia activation, lipid peroxidation, and antioxidant levels using immunofluorescence stain and ELISA on days 7 and 28 of post-WBRT.
Results: The radial maze was used to measure spatial learning and memory in rats. Compared with the 0 Gy-WBRT group, the 2 Gy-, 4 Gy-, and 10 Gy-WBRT groups of rats displayed a significant increase in latency. Seven days of post-WBRT, the newly proliferation cells (IdU positive) and serial replicating cells (CldU+IdU double positive) in the hippocampal dentate gyrus were significantly increased but were coupled with apoptosis. The alterations in the cellular composition of the dentate gyrus area were observed on days 7 and 28 post-WBRT, including increased newborn neuroblast and neuron, but half underwent apoptosis, which is associated with microglia phagocytosis and results in cognitive impairment. The lipid peroxidation was significantly increased on day 28 of post-WBRT. HBOT improves cognitive function by attenuating the WBRT-induced lipid oxidation, newly-formed cell apoptosis, and microglia phagocytosis.
Conclusion: Our present study suggests that HBOT may have a potential role in mitigating the effects of irradiation-induced brain injury by maintaining neurogenesis and reducing lipid peroxidation.

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2506

WEE1 Inhibition Promotes Radiotherapy-Induced Myeloid Suppressor Cells through cGAS/STING-STAT3-IRF3 Pathway

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Purpose/Objective(s): This study is the first to propose the WEE1 inhibitor combined with radiotherapy affect tumor microenvironment through cGAS/STING-STAT3-IRF3 pathway, and the effects of DNA damage caused by WEE1 inhibitor combined with radiotherapy on cGAS/STING-STAT3-IRF3 pathway and MDSC (myeloid-derived inhibitory cells) in tumor microenvironment were systematically expounded.
Materials/Methods: MDA-MB-231 cells, A549 cells and HT29 cells were irradiated with 2GY, 12GY and 20GY X-ray respectively, and cell cycle tests were conducted. WEE1 inhibitor combined with radiotherapy was used to cells. EDU kit was used to detect the changes of DNA damage repair and proliferation of tumor cells after irradiation. Western-blot experiment was used to detect the expression changes of cGAS/STING-STAT3-IRF3 pathway related proteins TBK1, P-TBKI, Sting, P-Sting, IRF3, P-IRF3 and cGAS. Immunofluorescence double-label experiment was used to detect the expression changes of target molecules in tumor cell control group and experimental group. The tumor-bearing model of mice was established, and the survival time and tumor volume of mice were detected. The differential expression of CD11B, LY6C, CD45, IFN-γ, CD8a and other immune-related molecules was detected by flow cytometry.
Results: The results of cell cycle experiment show that WEE1 inhibitor combined with radiotherapy can effectively inhibit G2/M phase of cell cycle compared with the control group. Compared with the control group, the tumor volume of mice in WEE1 inhibitor combined with radiotherapy was significantly reduced and the survival time of mice was significantly prolonged. The infiltration of CD8T cells and the secretion level of IFN-γ in tumor tissues of mice were detected by flow cytometry. The WEE1 inhibitor combined with radiotherapy group was significantly higher than that of the control group. The results of immunofluorescence double-label experiment showed that WEE1 inhibitor combined with radiotherapy reduced the infiltration of MDSC in tumor microenvironment after radiotherapy compared with the control group. Western-blot results showed that inhibition of WEE1 could significantly down-regulate the expression of TBK1, P-TBKI, Sting, P-Sting, IRF3, P-IRF3, P-STAT3 and cGAS through STATE3, which indicated that the radiation resistance induced by WEE1 inhibitor combined with radiotherapy was related to cGAS/STING-STAT3-IRF3 pathway.
Conclusion: WEE1 targeted therapy combined with radiotherapy can improve the microenvironment of inhibitory tumor and effectively alleviate radiotherapy resistance. The combination of WEE1 inhibitor and radiotherapy significantly inhibited the growth of tumor compared with single treatment, and the combined treatment achieved obvious inhibitory effect on tumor.

Author Disclosure: J. Hu: None.

2507

Carbon Ion Radiotherapy Exerts Anti-Tumor Activity by Inducing cGAS-STING Activation and Immune Response in Prostate Cancer-Bearing Mice

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Purpose/Objective(s): The aim of this study was to assess the influence on immune cell infiltration and T cell effector function to explore the immune response evoked by carbon ion radiotherapy (CiRT) in prostate cancer-bearing mice, and explored the mechanisms underlying CiRT-induced anti-tumor efficacy, involved in cGAS-STING signaling pathway.
Materials/Methods: C57BL/6 and BALB/c nude mouse tumor models were used to evaluate the efficacy of CiRT on tumor growth. Activation of cGAS-STING signaling pathway was performed by immunofluorescence analysis of cytoplasmic double-stranded DNA, western blot analysis of key factors involved in cGAS-STING pathway, and qRT-PCR analysis of the key downstream molecules like CCL5, CXCL10 and IFNβ1. Investigation of alterations of immunophenotypes including the quantification, memory status, exhaustion marker expression, and effector function were assessed by flow cytometry.
Results: CiRT showed more powerful tumor growth control of immunocompetent syngeneic C57BL/6 mice than photon radiotherapy did at biological equivalent dose of 5Gy. CiRT induces cytoplasmic DNA and cGAS-STING activation, and is functionally responsible for the observed tumor growth suppression. CiRT exerts anti-tumor effect by triggering immune response, characterized by increased infiltration of CD4+ T cells and macrophages in tumor, enhanced frequencies of CD8+ T cells and CD8+ T effector memory cells in spleen, improved interferon (IFN)-γ production ability of CD8+ tumor-infiltrating lymphocyte cells, and reduced expression of exhausted T cells in tumor and spleen.
Conclusion: Our findings indicate that CIRT exerts excellent anti-tumor activity, which may be attributed to the induction of cGAS-STING activation and immune response, manifested by increased immune cell infiltration, improved T cell effector function and enhanced immune memory.

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2508

Withdrawn