

ABSTRACT

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Neuropsychiatric sequelae of brain radiation therapy: A review of modality, symptomatology, and treatment options.

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OBJECTIVE: Consultation-liaison psychiatrists frequently evaluate cancer patients with brain involvement, and brain irradiation is often a mainstay of treatment for this population. A comprehensive review of the neuropsychiatric effects of brain radiotherapy is lacking in the psychiatric literature. This review aims to provide an in depth discussion of existing literature with guidance about treatments for radiation-induced neurocognitive decline.

METHODS: Narrative synthesis of available published literature retrieved from PubMed and MEDLINE databases. Particular focus was given to neuropsychiatric manifestations after radiotherapy, dose-response relationships, differential effects of whole versus stereotactic regimens, and studies investigating possible pharmacological treatments.

RESULTS: Brain irradiation induces cognitive, mood, and other symptoms that evolve in a time-dependent manner and adversely affect quality of life. Available data implicates loss of hippocampal neurogenesis and repair in post-radiotherapy changes. Clinical factors affecting incidence of neuropsychiatric compromise include total radiation dose, whole brain radiation, among others. Efficacy of pharmacological interventions is mixed for certain agents (ie, methylphenidate) but promising for others (ie, memantine).

CONCLUSIONS: Neuropsychiatric consequences of brain irradiation are common. Although our understanding of clinical manifestations and pathogenesis has advanced considerably, treatment options are poorly researched and use of any psychopharmacological intervention should therefore be tailored to individual patient needs.

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