Factors Associated With Sleep-Wake Disturbances in Child and Adult Survivors of Pediatric Brain Tumors: A Review

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Background

A key contributor affecting sleep-wake disturbances in brain tumor survivors is destruction of the hypothalamus, a radio-sensitive sleep-wake structure susceptible to long-term damage (Constine et al., 1993; Heikens et al., 1998). Cranial radiation therapy alters the hypothalamic-pituitary axis, with associated hormonal abnormalities and neurocognitive, sensory, and motor defects, as well as impaired sleep patterns (Constine et al.). Radiation dose and age at treatment affect the severity of sequelae (Anderson et al., 2001; Fagioli, Braunier, & Rappaport, 1991; Packer et al., 1999).

Reported sleep disturbances in brain tumor survivors include insomnia, excessive daytime sleepiness, limb movement disorders, sleep apnea, and increased nighttime awakenings (di Gennaro et al., 2004; Marcus, Trescher, Hallowner, & Lutz, 2002; Szucs, Bodzis, Barsi, & Halasz, 2001; Zembrinis, Paparrigopoulos, & Soldatos, 2002). Impairment of hypocretin-producing cells in the lateral and posterior hypothalamus increases somnolence and promotes secondary narcolepsy in some survivors (Arii et al., 2001; Nishino, Ripley, Overeem, Lammer, & Mignot, 2000; Selbach & Haas, 2006; Taheri,