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Assessing Common Sleep Disturbances in Survivors of Childhood Cancer

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ABSTRACT

The number of children, adolescents, and young adults transitioning into primary care is steadily increasing as the overall survival rates for childhood cancer improve. Survivors of childhood cancer are at significant risk for co-morbidities associated with their primary cancer and cancer therapy impacting their health-related quality of life. Sleep disturbances are now recognized as a public health concern and are common complaints among survivors of childhood cancer. This review will describe the most common sleep disturbances reported among survivors of childhood cancer, as well as appropriate evaluations to confirm sleep diagnosis and prescribed treatments.

Keywords: cancer, survivors, childhood cancer, sleep

INTRODUCTION

Treatment advances have resulted in an 83% 5-year survival in childhood cancers,[1] subsequently increasing the number of childhood cancer survivors. By 2020, it is estimated that there will be more than 500,000 survivors of childhood and adolescent cancer living within the United States.[2] As these children, adolescents, and young adults transition into primary care, nurse practitioners (NPs) are likely to encounter them in their practice and should be knowledgeable of potential late-effects related to the primary cancer and cancer therapy.

Insufficient sleep is recognized as an important public health concern and has been associated with chronic diseases, including cardiovascular disease, diabetes, depression, memory deficits, poor concentration, cancer, obesity, and reduced quality of life and productivity.[3–5] Sleep disturbance and fatigue are common complaints among survivors of both childhood and adult cancers, resulting from the cancer, cancer location, surgery, chemotherapy, and radiation.[6] Sleep disturbances include delayed sleep onset, frequent nighttime awakenings, excessive daytime sleepiness (EDS), obstructive sleep apnea (OSA), and restless leg syndrome. Those at greatest risk for sleep disturbances are survivors of Hodgkin lymphoma, solid tumors, and bone sarcomas. Survivors who reported pulmonary fibrosis and congestive heart failure were more likely to report fatigue, and those with congestive heart failure reported fatigue, increased sleep disruption, and daytime sleepiness.[5] Survivors of childhood brain tumors have also been described as having significant sleep disturbances that are most often related to tumor location and treatment,[7] with higher risk of sleep disturbance associated with tumors resulting in hypothalamic pituitary axis disruption. Overall, it is estimated that more than 50% of cancer survivors report some type of sleep disturbance.[8]

Sleep quality and both short (<8 hours) and long (>9 hours) sleep duration are particularly important and may precipitate inflammation and oxidative stress, which has been found to contribute to neurocognitive impairment in survivors of adult cancer.[9] The impact of sleep duration and poor sleep quality may disrupt the patient's daily activities and has been associated with pain, fatigue, depression, anxiety, disrupted family function, and lower reported quality of life.[5] As described in adult survivors, poor sleep quality has also been described as having a significant impact on neurocognitive function in childhood cancer survivors. Clanton et al[4] explored the risk of neurocognitive impairment among adult survivors of

childhood cancer and found fatigue, sleepiness, and sleep quality to significantly impact neurocognitive function. The impact of sleep disturbance had far greater impairment on the survivors' neurocognitive function than that of cranial radiation. While sleep disturbance is a common experience, it is estimated that more than 70% of survivors with insomnia fail to bring this to the attention of their health care provider. In addition to the lack of patient endorsement of insomnia, primary care providers report a lack of knowledge regarding the assessment of sleep disorders.[10] When asked to complete a standard measure of sleep, 85% of childhood cancer survivors endorsed difficulty with sleep, while 67% of the primary care providers failed to document sleep difficulty in those that endorsed the complaint.[8] To update the NP, the purpose of this article is to describe the most common sleep complaints/disorders in survivors of childhood cancer and the appropriate evaluation and treatment options for sleep disorders. Additionally, this update may be generalized to all patients because sleep disturbance has commonality with presentation of symptoms and associated morbidity/mortality within the general population.

ASSESSMENT

The patient history is most important in eliciting a sleep concern. Suspicion for sleep disturbance may be heightened if patient history is positive for treatment of a brain tumor, Hodgkin lymphoma, or having received cardiac or pulmonary toxic chemotherapy agents (specifically anthracyclines and radiation to the brain, neck, or chest). The review of systems should explore neurocognitive function, history of stroke, hypertension, cardiac disease (including congestive heart failure), and pulmonary dysfunction. A complete psychosocial review should elicit a history of depression, anxiety, bipolar disease, seasonal mood disorder, use of illicit drugs, and alcohol. Social history should document marital status, number of children and ages, as well as employment history. Lastly, a complete listing of medications should be reviewed for potential sedating side effects, as well as use of medications for sleep.

The sleep history should include questions regarding the quantity and quality of the patient's sleep, including frequency of the sleep complaint, the typical bedtime routine, use of devices (phone, computer) while in bed, difficulty falling asleep, difficulty maintaining sleep, early awakening or difficulty waking at desired time, and history of snoring or grasping for air during sleep. Other considerations should include the bedroom environment (temperature and light exposure), shift work, use of alcohol, caffeine, and nicotine, and recent accidents. Reports should also be obtained from bed partners in adults and from parents of pediatric patients. Lastly, the history should document the duration of sleep and severity of the sleep complaint (non-restorative sleep $\geq$ 1 month), interference with daily activities, and what steps the patient has taken to remedy the sleep complaint, including use of over-the-counter and/or prescribed sleep medications and medications for depression or anxiety. The NP should have a low threshold for referral to a sleep specialist because many patients become acclimated to sleep deprivation and may not recognize fatigue and excessive sleepiness as problematic.

COMMON SLEEP DISORDERS/COMPLAINTS IN SURVIVORS OF CHILDHOOD CANCER

There are many potential sleep disorders that the NP may encounter in clinical practice. According to the ICSD-3 nomenclature, the general categories of sleep disorders include insomnia, sleep-related breathing disorders, central disorders of hypersomnolence (excessive sleepiness), circadian rhythm sleep-wake disorders, parasomnias, and sleep-related movement disorders. Patients have described sleep disorders as difficulty getting to sleep, maintaining sleep, or ENS, abnormal movements, behaviors, emotions, and dreams that occur while falling asleep or between sleep stages or during arousal from sleep. This review is limited to the 4 most common sleep disorders/complaints that the NP might encounter in the care of the survivor of childhood cancer and include insomnia, OSA, and central disorders of central hypersomnolence, including narcolepsy.

Insomnia

Insomnia is commonly endorsed by survivors of childhood cancer and is defined as short-term (symptoms of $<$ 3 months) or chronic ($\geq$ 3 months). Symptoms include difficulty initiating or maintaining