Chapter 14
Childhood Cancer and Neuropsychological Challenges Regarding Clinical Assessment and Treatment Plans

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ABSTRACT

Research into childhood cancer and the neuropsychological effects on them, provides a great insight into the long-term developmental and cognitive impacts that survivors among several types of cancer go through. It can lead to various chronic difficulties such as memory loss, attention deficits, language impairments, motor problems and executive skills among others which are crucial for leading an independent way of living especially in adult life. Since most treatments have been shown to have several impacts on the patients neuropsychological functioning, having a great insight into different types of therapies consequences is of great importance.

INTRODUCTION

Cancer encompasses a group of diseases characterized by a common feature: abnormal cell growth caused by genetic mutations that can invade various parts of the body (Brown et al., 2023). While normal cells grow, divide, and die in a controlled and orderly manner, cancer cells disregard these mechanisms, dividing uncontrollably. This uncontrolled growth leads to the formation of tumours, which are catego-

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rized into benign and malignant types (Santra, 2022). Benign tumours remain localized, without invading surrounding tissues, whereas malignant tumours exhibit invasive and metastatic behaviour (Agrawal et al., 2024). The root cause of cancer lies in alterations in the genetic material of cells, often due to the failure of DNA repair genes to rectify these changes (Lord et al., 2012).

The World Health Organization (2024) highlights cancer as a leading global cause of death, with approximately one in five individuals developing cancer in their lifetime. Alarmingly, about one in nine men and one in twelve women succumb to the disease. Projections estimate a 77% increase in cancer cases by 2050, rising from 20 million in 2022, with low- and middle-income countries disproportionately affected due to environmental factors such as air pollution, tobacco use, obesity, physical inactivity, and alcohol consumption (WHO, 2024). Beyond its direct effects, cancer and its treatments often lead to neurological disabilities, impacting nearly all body systems, including the brain, reproductive organs, skin, blood, and bones (Frazier et al., 2020).

This paper aims to review the neurocognitive impacts of cancer across patient populations, with a particular focus on childhood cancers. By examining how cancer and its treatments influence cognitive, behavioural and emotional outcomes, the study highlights the importance of early interventions and tailored rehabilitation programs to mitigate long-term effects.

ADULTHOOD CANCER

Key Research: Significant research has explored how cancer affects patients' ability to maintain independent living and the neuropsychological impact of different cancer types. Megari (2021) examined instrumental activities of daily living (IADL) and neuropsychological functioning among cancer patients, exploring language function impairments (2020) and cognitive deficits observed pre- and post-chemotherapy (2020). Her study involved 182 adult patients with thyroid, colorectal, breast, and prostate cancers. Findings revealed that breast cancer patients experienced the greatest difficulty performing IADLs compared to other groups. Moreover, individuals with greater disabilities demonstrated poorer IADL performance.

Post-chemotherapy cognitive decline was evident in 45 individuals, affecting visuospatial perception, executive functions, attention, working memory, and both short- and long-term memory. Notably, 42 individuals exhibited similar cognitive impairments six months post-treatment. Breast cancer patients also performed worse in language tasks compared to patients with other cancer types.

Megari et al. (2024) further investigated postoperative cognitive dysfunction (POCD) in elderly patients undergoing orthopedic versus oncological surgery. Results indicated that oncology patients demonstrated cognitive improvement over time, while orthopedic patients exhibited consistent cognitive decline, particularly in attention, executive functions, and short-term memory. These findings accentuate the need for research into long-term neurocognitive outcomes in cancer patients and the development of rehabilitation programs tailored to their unique needs.