The Effects of Chemotherapy and Estrogen on Cognitive Function in Premenopausal Women with Breast Cancer

I conducted my summer 2008 research in a department that focuses on the contribution of psychosocial and behavioral factors to the development and management of physical and mental diseases. I was specifically involved in a study focused on the cognitive effects of chemotherapy.

The study aims to investigate whether premenopausal women with early stage, localized breast cancer, who are undergoing chemotherapy and chemotherapy-induced estrogen depletion, experience a decline in attention, memory, working memory, language, motor, and psychomotor abilities. The primary hypothesis for this study is that premenopausal women with breast cancer will exhibit a decline in cognitive function from pre- to post-chemotherapy treatment in several domains, including attention, working memory, and processing speed.

Since this study has been recently initiated, there is still ongoing recruitment of participants. The study has an experimental group of participants that consists of women undergoing breast cancer surgery who are scheduled for adjuvant chemotherapy. There are also two groups of control subjects, one of which has at-risk women diagnosed with benign breast disease and the other group consists of healthy women, without breast cancer.

I have been involved in many aspects of the study, including the evaluations given to the experimental group. These women are evaluated at three different times: two or more weeks after breast surgery but before beginning chemotherapy, then within one month after completion of a three- to six-month chemotherapy regimen, and lastly, 6 to 8 months after completion of the second evaluation. The evaluations use several tests to determine the subject’s intelligence (with the use of the North American Adult Reading Test and a demographic intelligence estimate), motor skills (using tests like the Finger Tapping Test and Simple Reaction Time), psychomotor abilities (using the Trail Making Test), attention (through the Continuous Performance Test, memory (with the use of tests like the Buschke Selective Reminding Test), and finally, language (with the use of tests like Controlled Oral Word Association Test). My responsibilities mainly included helping to review any research plan reports related to the study, checking the completed evaluations to ensure that the calculations of test scores had been done accurately, and then inputting the test scores and any additional information into data spreadsheets. I was also involved in recording data from pre-screening evaluations, which basically confirmed the subject’s medical history.

The study has not yet been completed; thus, no conclusions have yet been made. However, this project is expected to contribute to breast cancer research by investigating the cognitive deficits that have been reported by many survivors and attributed to chemotherapy.