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Assessment of Treatment-Related Effects on Cognition in Multiple Myeloma Patients Undergoing Autologous Stem Cell Transplant

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Background: Treatment of multiple myeloma patients consisting of induction chemotherapy followed by autologous stem cell transplant has been shown to improve event-free survival and overall survival. This prolonged survival has unmasked long-term complications related to therapy that we have yet to evaluate properly. Studies in solid tumor cancers have identified cognitive impairment (or “chemo brain” as described by patients) when exposed to certain chemotherapy agents based on duration of exposure or dose. To date, there are no studies evaluating the impact autologous stem cell transplant may have on a patient’s cognition. In this study, we assessed patterns of cognitive impairment before and after stem cell transplant in multiple myeloma patients and the impact of gender on these changes.

Methods: This is a prospective cohort study enrolling 35 patients. Key eligibility criteria include: having multiple myeloma (by IMWG criteria), having completed induction chemotherapy prior to evaluation, and undergoing an autologous stem cell transplant as part of their consolidation. Each patient completed three standardized cognitive assessment tools (MoCA, SAGE, and PROMIS) at two time points: during pre-transplant evaluation and between 85-110 days post-transplant. Different test versions were used at each time point, and the order in which patients completed each version was determined by randomization. Additionally, patients were surveyed at the end of the study about their preferred assessment tool. All data was captured in RedCap and analyzed by the study team once patients completed both time point assessments.

Results: To date, 48 patients have been enrolled. Twelve were removed from the study due to failing transplant evaluation, relapsing prior to post-transplant evaluation, or withdrawing consent. Of the remaining 36, 10 females and 12 males have completed pre- and post-transplant assessments. Preliminary data show a small increase in MoCA scores between pre- and post-transplant time points (0.7 among females and 0.75 among males). While PROMIS scores decreased over time among females (mean= -2.6), SAGE scores increased (mean=1.7). Conversely, PROMIS scores increased among males (mean=4) while SAGE scores decreased (mean= -1). Overall, patients did not express a preference between the SAGE and MoCA.

Conclusions: Based on trends in preliminary data, there was a discrepancy between patient-perceived cognitive deficits as reported in the PROMIS and memory and thinking impairments as measured by the SAGE. Females reported feeling more cognitive deficits post-transplant despite increased SAGE scores. Males reported fewer cognitive deficits while SAGE scores decreased. Cognitive assessment of multiple myeloma patients is feasible and acceptable with both the SAGE and MoCA, suggesting community centers may be able to perform assessments using the self-administered SAGE and PROMIS in lieu of providing MoCA-trained specialists. The study is ongoing and further statistical analyses will be performed upon completion.

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