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731.AUTOLOGOUS TRANSPLANTATION: CLINICAL AND EPIDEMIOLOGICAL

A Pilot Study to Determine the Safety and Efficacy of Repeated Hyperbaric Oxygen Therapy in Multiple Myeloma Patients Undergoing High-Dose Therapy and Autologous Stem/Progenitor Cell Transplantation

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Background
Serum erythropoietin (EPO) negatively impacts hematopoietic stem cell homing and engraftment. Hyperbaric oxygen (HBO) therapy can reduce serum EPO in healthy volunteers and when given prior to stem cell infusion may improve engraftment after hematopoietic stem cell transplant (HSCT).
We previously performed a phase II trial randomizing patients with multiple myeloma undergoing high dose melphalan and autologous HSCT 1:1 between a single HBO treatment and no HBO. HBO was given as 100% oxygen, 2.5 ATA for a total of 90 min, in a single treatment on Day 0 prior to the transplant. A total of 99 patients were enrolled with 52 randomized to HBO. HBO significantly reduced EPO levels for the first 24 hours after auto transplant, but EPO levels quickly rebounded by 48 hours after transplant.
We hypothesized multiple HBO treatments will keep EPO levels low during the duration of stem cell homing (i.e: the first 72 hours after HSCT) and may improve neutrophil and NK cell recovery.
Methods
We performed a pilot study to evaluate the safety and tolerability of multiple HBO treatments during autologous HSCT. Patients with multiple myeloma undergoing autologous HSCT were eligible. Patients received HBO therapy, consisting of hyperbaric oxygen at 2.5 ATA for a total of 90 minutes breathing 100% oxygen on days 0 (prior to HSCT), 1, and 2 of transplant. The primary objective of this pilot study was to determine the safety of repeated HBO therapy in the setting, as defined by treatment limiting toxicity (TLT) including occurrence of seizure disorder, pneumothorax, death, or any irreversible grade III or any grade IV toxicity within 24 hours of HBO therapy. Secondary objectives were to determine the effects of multiple HBO therapy on neutrophil count recovery and the effect of multiple HBO on serum EPO.
Results
10 patients have been enrolled that are evaluable for the primary objective. All patients had multiple myeloma and 4 were female. 9/10 patients successfully completed all 3 HBO treatments and 1/10 completed HBO on days 1 and 2 only because of ear pain on day 0. No patients experienced treatment limiting toxicity. The median times to neutrophil and platelet engraftment was 12 days (range 11-14) and 16 days (range 14-28), respectively. The median length of hospitalization was 13 days (range 12-16). Febrile neutropenia occurred in 3/10 patients with just one incidence of documented infection. This was significantly less than the rate of febrile neutropenia in patients receiving a single treatment of HBO or no HBO (81% and 47%, respectively, $p<0.05$). 3 patients required red blood cell transfusion and 5 platelet transfusion.
Conclusions
Multiple HBO treatment were well tolerated without treatment limiting toxicity during autologous HSCT for multiple myeloma.

Disclosures No relevant conflicts of interest to declare.

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