practice with subsequent hospitalizations. Patients treated with high dose chemotherapy and stem cell rescue for CNS tumors have disrupted sleep and those with high risk disease appear to have poorer sleep quality in comparison to average risk. Poorer sleep quality in high risk patients may be a result of more extensive surgery, residual tumor and higher doses of radiation. Lastly, nurses play a role in optimizing the sleep environment for patients; attention needs to be focused on sleep interventions for high risk patients undergoing stem cell transplantation.

120

Hear Our Voices: Patient’s Perspective of Financial Impact of Allogeneic HCT
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Topic Significance & Study Purpose/Background/Rationale: Medical science has made great improvement in Allogeneic Hematopoietic Cell Transplantation (HCT) over recent decades. Current treatment modalities offer many recipients curative treatment or increased long-term survivorship. Practice guidelines are working to identify and improve patient care outcomes and long-term effects of HCT, offering patients an opportunity to live with their disease post-transplant. However, the reality is that, for many, surviving HCT offers a mixed blessing. Many practitioners have identified frustrations in post-transplant follow-up care related to the financial impact of HCT care. Patients report devastating impacts upon quality of life (QOL), beyond the medical concerns of GVHD or other chronic health problems related to HCT. They report life stressors which may ultimately affect their health and well-being. While much has been done to offer improved survivorship and quality of care with HCT, little seems to have been studied regarding the QOL and financial impact of HCT upon post-transplant survivors.

Methods, Intervention, & Analysis: Data analysis included qualitative analysis based on a questionnaire which was mailed to 482 patients (268 respondents= 56%) who had survived allogeneic HCT at the 3 study sites at Mayo Clinic from 1/06 to 6/12. Questions in the survey were about health insurance, prescription/medical costs, and employment which allowed for subjective data on illness and the impact that HCT has on one’s QOL, physical and emotional well-being, personal finances, as well as resource allocation post-HCT. A section in the questionnaire allowed for patient comments. This study discusses their open-ended, candid responses to the impact of transplant. It also allowed for any thoughts in information that could have helped them better prepare financially for post-transplant care.

Findings & Interpretation: Our sample (n=268 respondents) reported issues with employment, insurance, and disability. A majority conveyed an adverse financial impact (>54%) such as a reduction in household income >50%, need to sell/mortgage home, withdraw money from savings, and paying more than they could afford for their medical care. 73% reported that being sick had hurt them financially, with 3% declaring bankruptcy.

Conclusions: A significant proportion of post-HCT survivors report an impact on their personal finances and QOL, despite having health insurance coverage. Future research could help identify at-risk patients, counsel resources, and support interventions which could improve outcomes of HCT.

Discussion & Implications: As transplant practitioners, we are trying to be advocates of cancer survivorship, yet consideration of QOL and the financial impact of transplant care should be considered if we are to practice ethically. Recommendations for correlating QOL studies in HCT, can help to improve patient outcomes throughout the continuum of care, while helping our patients in what can be lifelong coping with chronic survivorship. Open-ended patient responses help give practitioners a sense of the emotion and depth of impact as they tell us how transplant affected their lives. It is important to let patient’s know we are listening, so that we can open paths for conversation and improve outcomes.

121

Comparing the safety and efficacy of red blood cell transfusion dose in hematopoietic stem cell transplant patients: single versus double unit transfusions
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Topic Significance & Study Purpose/Background/Rationale: Until recently, the national standard practice for blood transfusions in bone marrow transplant patients was two units of red blood cells (RBCs) per transfusion episode. This practice was called into question due to safety concerns, suggesting that one unit of RBCs per transfusion episode may be an equivalent or even safer and less costly practice (assuming factors such as amount of bleeding and hemoglobin level are equal). Following a thorough review of existing blood management practices and review of the literature, our academic medical center changed practice to routinely transfuse one unit of RBCs per low hemoglobin (7-8 g/dl) episode if certain clinical criteria were met. Following IRB approval, a retrospective medical record review began to evaluate this practice change among two groups of hematology-oncology patient populations (allogeneic and autologous bone marrow transplant). Patient records from these two groups of patients are being evaluated before and after the practice change (one vs two units of RBCs/transfusion) looking at average units of blood products transfused per patient, impact on length of stay, and estimate of nursing time costs. The project is expected to generate new knowledge regarding safe blood management practices in hematology-oncology patient populations.

Methods, Intervention, & Analysis: The project is using the hematology oncology inpatient unit log of admissions and discharges to identify adult allogeneic and autologous bone marrow transplant patients who received a blood transfusion for a hemoglobin of 7-8g/dl and hematocrit above 21%; and were not actively bleeding, septic, experiencing a major infection, or pregnant. Patient data are being obtained from the University HealthSystem Consortium (UHC) database. 400 cases are being enrolled, 200 from pre-practice change (7-1-2009 to 6-30-2011) and 200 from post-practice change (9-1-2011 to 8-31-2013). A two-month gap was purposefully included between the two time periods to allow for full transition to the new practice standard of one unit of RBCs/transfusions. Data thus far suggests a reduction in red blood cell utilization at an average of 1.3 units per hospital discharge. Based on these utilization trends, we are estimating a cost savings of at least $1300 per month just in purchase cost ($200 per RBC unit X 1.3 units per discharge X an average of 5 patients/month). Additionally, we are estimating a savings in nursing hours of approximately 13 hours per month (2 hours per RBC transfusion X 1.3 units per discharge X an average of 5 patients/month).
Findings & Interpretation: Preliminary project findings indicate promise for the standard practice of transcribing one unit of RBCs per low hemoglobin episode for allogeneic bone marrow transplant and autologous bone marrow transplant patients. After data collection is complete, formal statistics will be completed to compare the mean number of RBC units between the practice of routinely transcribing 1 RBC unit and the practice of routinely transcribing 2 RBC units, as well as comparing length of stay and costs. Early conclusions suggest the goal of improving the safety of blood transfusions and preserving a precious resource might be achieved with this important practice change for two groups of oncology patients. These results will inform other practice settings to improve their use of blood management products for oncology patients and promote patient safety and cost-effective practices. Use of the UHC database as a meaningful resource for practice improvement projects and research studies will be highlighted. Continued evaluation and ongoing improvement of blood management practices at the project site will be discussed with suggestions for other settings and practices.

Discussion & Implications: This will help improve the safety of blood transfusions. It could guide future studies with baseline information from this transfusion practice change. Other oncology areas could adopt a similar practice change, educate patients and clinicians on safe transfusion practices.

Away with the Alcohol: The Impact on Clostridium difficile Infection (CDI) Rate on a Complex Bone Marrow Transplant Unit
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Topic Significance & Study Purpose/Background/Rationale: This Bone Marrow Transplant Unit (BMT) is a 24 bed critical care environment that cares for a highly complex patient population with underlying oncologic, immunologic, marrow failure, and metabolic disorders. Hand hygiene is stressed and alcohol gel products are located inside and outside patient rooms. Infection Control (IC) conducts daily surveys for patient infections and reports them to BMT staff. During 2009, an increase in Clostridium difficile (CDI) cases was detected on the BMT unit.

Methods, Intervention, & Analysis: Due to the frequency of CDI, isolation and environmental cleaning practices were evaluated. Bleach was implemented for discharge cleaning and hand washing with soap and water on patient room exit was reinforced with education and signage, to both staff and caregivers. BMT staff and IC implemented initiatives to declutter the unit and facilitate environmental cleaning. After these initiatives, the number of CDI remained high. After review, in September of 2010, alcohol gels were removed from all patient rooms and a “gel in, wash out” initiative was adopted.

Findings & Interpretation: After alcohol gel was removed from patient rooms, the number of CDI cases has fallen and the days between CDI have increased. In the midst of other interventions, it appears the greatest impact for the decrease was related to the simple intervention of removing alcohol gel from inside patient rooms, and instituting hand washing with soap and water before exiting a patient room. Prior to the alcohol gel removal, the CDI rate was 1.68 infections per 1000 patient days. The intervention decreased the rate to 0.35 infections per 1000 patient days, a significant 79% rate reduction.

Discussion & Implications: Hand washing when exiting patient rooms enhances patient safety by removing Clostridium difficile spores and other pathogens that may not be killed by alcohol gel products.

Human Herpes Virus-6 Viremia is associated with poor clinical outcomes in Children following Allogeneic Hematopoietic Cell Transplantation (AlloHCT)- Statistical Noise or a Real problem?
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Topic Significance & Study Purpose/Background/Rationale: Human Herpes Virus 6 (HHV-6) is an evolving pathogen in the field of AlloHCT. The impact of HHV-6 viremia on AlloHCT outcomes in children has not been well described. At our center, one patient died from HHV-6 and/or its treatment; another asymptomatic patient had a very high HHV-6 viral load (>1 million copies/ml) that was refractory to treatment with Ganciclovir, Foscarnet and Cidofovir. These two cases prompted us to create a standard operating procedure for HHV6 monitoring in an effort analyze the clinical impact of HHV-6 viremia following AlloHCT.

Methods, Intervention, & Analysis: We monitored weekly HHV-6 PCR starting pre-AlloHCT and up to Day +180 post-transplant from 2008-2012 on 100 children (median age, 8 years; range 0.25–22 years; 35 F/65 M) undergoing AlloHCT for both malignant (n=53) and non-malignant (n=47) diseases. Conditioning regimens consisted of either myeloablative (n=43, 43%), reduced toxicity (n=34, 34%) or reduced intensity (n=23, 23%) regimens with 47% of total patients receiving altemuzumab and 30% of total patients receiving rabbit anti-thymocyte globulin. Donor sources included matched family donor (n=42, 42%), matched unrelated donor (n=28, 28%) and unrelated cord blood (n=20, 20%).

Findings & Interpretation: The incidence of pre-AlloHCT HHV-6 viremia was 3% (n=3). Following AlloHCT, 18 patients developed HHV-6 viremia and 10 patients had recurrence of viremia. The incidence of peri-AlloHCT (day 0- day+14), early (day +15-day+98) and late HHV-6 viremia (day +99) was 5%, 14% and 9%, respectively. The average time to clear viremia was 6 weeks (range 1–23 weeks). The median time to platelet engraftment in patients with HHV-6 viremia was delayed in relation to unaffected patients (p=0.004). Furthermore, the incidence of platelet engraftment by day +180 was lower in patients with viremia than in unaffected counterparts (p=0.038). Overall, HHV-6 viremia was associated with higher transplant-related mortality [TRM] (0.003) [Table] though we did not observe any case of encephalopathy or deaths directly related to the HHV-6 itself.

Discussion & Implications: With this study, we demonstrate that HHV-6 is prevalent in children undergoing AlloHCT and that HHV-6 viremia is associated with significant platelet engraftment delay and transplant related mortality. Further clinical sequelae of HHV-6 viremia remain difficult to ascertain. Each PCR test costs $120 resulting in approximately $250,000–300,000 of hospital cost over the four-year study period. Due to lack of clear understanding of clinical consequences, we no longer routinely perform PCR monitoring of HHV-6. To elucidate the role of HHV-6, univariate and multivariate analysis will be conducted to study various risk factors that may contribute to delayed platelet engraftment and TRM post-AlloHCT in an effort to identify who might benefit from routine HHV-6 PCR monitoring in the future.