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LONGITUDINAL ASSESSMENT OF QUALITY OF LIFE AND SYMPTOMS OF ETHNICALLY DIVERSE BLOOD AND MARROW TRANSPLANTATION PATIENTS

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Several investigators in the nursing, medicine, and psychology have examined the effects of BMT on quality of life (QOL). Several studies indicated a significant reduction in QOL and persistent symptoms of fatigue, insomnia, anorexia, and nausea in the first year after BMT (Kopp, Schweigkofler, Holzner, et al. 1998, Winer, Lindley, Hardee, et al. 1999, Hann, Jacobsen, Martin, et al. 1997). The long-term impact of BMT on QOL has been examined (Andrykowski, Carpenter, et al. 1997, Andrykowski, Brady, et al. 1995 and Andrykowski, Bishop, Hahn, Cella, et al. 2005). None of these studies examined differences of QOL and symptoms among ethnically diverse groups of patients.

In our recently completed National Institute of Health sponsored study, the correlation of quality of life and symptoms were evaluated at multiple time points over the course of 100 days in 164 African-Americans (n=24), Hispanic (n=38) and non-minority (n=102) patients. The Functional Assessment of Cancer Therapy (FACT-BMT) measuring quality of life and MD Anderson Symptom Inventory (MDASI) assessing symptoms and symptom interference with life were used in the study. Other variables examined included disease, type of transplant, age, graft vs. host disease (GVHD) and survival. Preliminary results indicate that patients receiving myeloablative regimen experienced severe symptoms such as fatigue (p<0.02) and pain (p<0.03) and poorer QOL (p<0.01) across time. Symptom severity correlates (r= -0.59 to -0.75) with QOL across time. In addition, there were no significant differences in symptom severity, symptom interference and ECOG performance status between Hispanic and African-Americans over time. There were significant differences in symptom severity, symptom interference, and ECOG performance across time in both minority and non-minority groups of BMT patients. Results of this study add to the knowledge related to symptom clusters and QOL with this treatment modality and help to guide development of relevant patient teaching material.

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CHOICE OF DIET AS PART OF TREATMENT FOR GI GVHD

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Purpose: To determine which diet can be used to help decrease amount of diarrhea as associated with GI GVHD (gastrointestinal graft-versus-host-disease)

Methods: Based on our institution's guidelines for nutritional support of patient's undergoing GI GVHD after allogeneic stem cell transplant.

Result: There are 4 levels of diet that is used for GI GVHD; patients are placed on these diets depending on the severity of their symptoms.

Conclusion: GI GVHD is a major complication after allogeneic hematopoietic stem cell transplantation. This can cause diarrhea, nausea, vomiting, abdominal cramping and pain. With large amounts of diarrhea, for instance in Stage 4 GI GVHD (severe cramps with or without ileus), the physician may ask the patient not to eat or drink for a few days to allow the GI (gastrointestinal) tract to rest. In MD Anderson a four-stage diet, intended for stem cell transplant patients who experience symptoms from graft-versus-host disease is utilized. Dietary recommendation varies from nothing-by-mouth for the most severe (Stage 4) to limiting high fat and fiber foods for 500-1000 ml diarrhea (Stage 1). Calories, proteins, vitamins and minerals are provided through initiation of total parenteral nutrition (TPN) to meet their nutritional needs while on diet restriction.

While nutrition is monitored, multidrug therapies are started as well, such as steroids, antithymoglobulin and other newer agents like Infliximab. The patient's compliance to the diet prescribed is of utmost importance to help minimize symptoms of GI GVHD.

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REDUCING CENTRAL VENOUS CATHETER RELATED BLOODSTREAM INFECTIONS IN CHILDREN WITH CANCER

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The purpose of this study was to determine whether a comprehensive educational program influenced the incidence of colonization of central venous catheters (CVC) and bloodstream infection (BSI) rates in children with cancer.

CVC infections rates in children with cancer range from 1.0 to 4.58 per 1000 catheter days. CVC hub sites provide bacterial access to the bloodstream and hub colonization rates in adults vary from 29%-38%. Previous studies show that increasing staff and parenteral awareness with education that emphasizes aseptic technique can decrease catheter infection rates.

A total of 121 registered nurses attended a one-hour educational program that included a didactic component, a hands-on clinical simulation and pre- and post-education learning assessments. Prior to the education program, 51 catheter hub cultures were obtained from a convenience sample of 27 children with cancer. Cultures were obtained by swabbing the threaded area of the catheter hub after removing the injection cap. A semi-quantitative culture for bacteria and fungus was obtained. Thirty-nine catheter hub cultures were obtained within 3.5 months after the education program from 20 children. The mean age of the patients was 8.2 years; 78% were diagnosed with leukemia and 22% with solid tumors. Surveillance of monthly catheter-related bloodstream infections was tracked for a six-month period for bone marrow transplant (BMT) and general oncology patients upon completion of the staff education program.

Pre- and post-education assessment of nursing staff revealed the post-test mean score of 86.5% was significantly better than the pre-test mean score of 72% (p<0.001). Prior to the education program, 57% of the hubs were culture positive and after the educational program the proportion of culture positive hubs was reduced to 36%. The two-proportion test procedure showed significant reduction in culture positive hubs following the intervention (p=0.043). Post-intervention, BSI rates reduced from 5.59 to 3.35 per 1000 catheter days for BMT patients and from 4.89 to 3.03 per 1000 catheter days for general oncology patients. A log-linear model showed a significant reduction (p<0.001) in infection rates following the educational program for both patient populations.

The results of this study indicate that a comprehensive educational program increases nurses' knowledge of CVC care and reduces CVC hub colonization and catheter-related bloodstream infections in children with cancer.

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STEM CELL TRANSPLANTATION FOR OSTEOPETROSIS: ONE CENTER'S EXPERIENCE

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Osteopetrosis is a rare metabolic disorder characterized by abnormally dense bones due to a defect in the osteoclasts, the cells responsible for bone resorption. Osteopetrosis generally presents in infancy. Infants are brought to medical attention through incidental skeletal radiographs and hypocalcemic seizures. Patients with osteopetrosis are at high risk for morbidity and mortality. They may present with pancytopenia, cranial nerve abnormalities and respiratory difficulties. Pancytopenia is caused by the overproduction of bone, which results in obliteration of the marrow cavity. Loss of vision and hearing is a direct result of narrowing of the cranial foramina. Respiratory difficulties are thought to occur due to narrowing of the nasal passages and the relatively immobile rib cage restricting lung movement. Osteoclasts are derived from hematopoietic stem cells and thus, by providing donor osteoclasts, allogeneic stem cell transplant (SCT) can be curative.

From 1997 through 2005, five patients with osteopetrosis received allogeneic stem cell transplants at Dana Farber Children's Cancer

Care in Boston, MA. At the time of SCT, these patients ranged in age from 2 to 11 months old. Conditioning regimens prior to transplant all contained a combination of intravenous busulfan, cytoxan, and an additional lymphocytotoxic agent such as fludarabine, alemtuzumab or anti-thymocyte globulin. Three of the five patients required intubation at a median of day + 4 post transplant. All but one patient was successfully extubated at a median of 31 days post transplant. That patient was removed from life support due to multi-organ failure at day + 44 having not yet engrafted. The remaining four patients engrafted at a median of 40 days post transplant. Two died after day + 100, one of a bacterial infection and the other of enteroviral myocarditis. Two long-term survivors are well and developing appropriately at 9 months and 33 months post-transplant. Infants with osteopetrosis seem to have an increased risk of pulmonary and infectious complications. Mothers of these patients are recently post-partum and families are often far from home at a tertiary care center. Nursing implications for the care of the osteopetrosis patient during SCT include vigilant monitoring of respiratory status, vital signs and laboratory results. Extensive family support and education regarding the disease and the transplant process is also essential for the care of these children and their families.

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CARDIAC AMYLOIDOSIS AND STEM CELL TRANSPLANTATION: WHAT NURSES NEED TO KNOW

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Primary (AL) amyloidosis with cardiac involvement is commonly seen in patients with multiple myeloma (MM). More than twenty-five percent of patients with cardiac amyloidosis will develop heart failure. Thus, as more patients with MM seek stem cell transplantation for treatment of their disease, health care providers can expect to see more complications related to cardiac amyloidosis. In order to better prepare nurses caring for MM patients with cardiac amyloidosis, a teaching poster has been developed that increases stem cell transplant nurses' knowledge about cardiac amyloidosis.

The educational poster focuses on improving early recognition and management of AL amyloidosis through increased nursing knowledge of signs and symptoms of cardiac amyloidosis. Early signs of cardiac amyloid involvement include dyspnea, fatigue, peripheral edema, systolic murmur, dysrhythmia, and postural hypotension. Nurses should be prepared to adjust patient daily routines in order to provide supportive treatment for hypotension and congestive heart failure. It is important for nurses to become more aware of the signs and symptoms of AL amyloidosis in order to alert primary care teams of changes in patient condition, inquire about telemetry monitoring and cardiology consults. Therefore, the ultimate goals of increasing knowledge among nurses caring for stem cell transplant patients with cardiac amyloidosis are better symptom management, appropriate multidisciplinary participation in care, and positive patient outcomes. These goals are attainable when nurses more completely understand their patients' medical conditions and increased knowledge may be evaluated through positive post-test results after presentation of the educational poster.

A case presentation of a patient with multiple myeloma and cardiac amyloidosis who underwent stem cell transplantation will illustrate these teaching points and nursing issues as well as highlight the ethics surrounding stem cell transplantation and cardiac amyloidosis.

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PRIMARY CARE IN A TERTIARY SETTING OF STEM CELL TRANSPLANTATION

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The traditional role of a nurse practitioner is in a primary care setting; however nurse practitioners are prepared by education and clinical training to function in a variety of settings. This poster will explore how a nurse practitioner in a major cancer referral center

provides comprehensive care and has a positive impact on patients and staff in the complex setting of hematopoietic transplantation.

Setting: Major Cancer Referral Center, Department of Stem Cell Transplantation and Cellular Therapy

Staff: Adult Nurse Practitioner (ANP), RNs, LVNs, Pharmacists, Physicians, and Patient Service Coordinators

Roles of Nurse Practitioner: Patient Care - Provides quality, evidence-based patient care. Patient population includes a variety of complex cancer patients with multiple myeloma, lymphoma, leukemia, aplastic anemia, melanoma, glioblastoma, and neuroblastoma that are undergoing autologous or allogeneic hematopoietic cell transplantation or participating in vaccination clinical trials. ANP performs comprehensive health assessments, identifies normal and abnormal characteristics, develops treatment plan, initiates appropriate care and continuously evaluates outcomes. Collaborates with multidisciplinary health care team of nurses, physicians, pharmacist, social worker, case manager, nutritionist and chaplain.

Educator - Provides education to hospital and nursing staff, other healthcare workers, students, patients, and patient's family members regarding prevention and management of symptoms related to the transplant process. Conducts lectures and inservices on a variety of transplant-related topics within the hospital/clinic environment as well as at local and national conferences.

Research and Quality Improvement - Participates in a variety of research protocols including stem cell research and development of new therapies for transplant patients. Serves as an active member of the quality improvement committee of stem cell and cellular therapy that monitors for trends, outcomes, and adverse effects to improve processes and positively affect patient care.

Outcomes - High level of patient satisfaction, documented by quarterly patient satisfaction surveys

Decreased number of hospital admissions and length of hospital stays

Increased revenue of outpatient clinic.

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SURVEILLANCE, EVALUATION AND MANAGEMENT OF PASSENGER LYMPHOCYTE SYNDROME

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Sudden immune hemolysis in the setting of ABO and non-ABO mismatched allogeneic stem cell transplantation is a potentially life-threatening complication that requires early recognition and a multidisciplinary care team to deliver immediate lifesaving measures. The BMT Program at The Ohio State University James Cancer Hospital developed a Plan of Care providing guidelines for surveillance, evaluation and management of immune hemolysis related to Passenger Lymphocyte Syndrome.

Surveillance consists of a direct antiglobulin testing (DAT) performed on day +7, +14 and +21 and monitoring of donor antibody in the patient's ABO reverse typing or antibody screen. If a donor has a clinically significant RBC antibody, the patient is antigen typed for the respective antigen.

Discovery of a positive DAT and the presence of the donor's antibody, an initial hemolytic evaluation is performed including: lactate dehydrogenase (LD), total and direct bilirubin (BIL), haptoglobin and hemoglobin/hematocrit (H/H).

If the hemolytic evaluation is negative, H/H every 12 hours and BIL, LD daily are performed until day +28 to monitor for hemolysis.

If the hemolytic evaluation is positive without significant hemolysis (i.e., <2 g/dL drop in hemoglobin), H/H every 12 hours and BIL, LD, HAPT, urinalysis daily are performed until day +28.

RBC exchange is considered in the setting of laboratory evidence of hemolysis when: a patient has related, significant physical symptoms, a ≥ 2 g/dL in hemoglobin in 24 hour period, or impairment of creatinine clearance and/or hemoglobinuria.

Order sets have been implemented through electronic ordering pathways. Ongoing, prospective evaluation of the strategy is underway.