

# Growth Patterns and Gastrointestinal Symptoms in Pediatric Patients After Hematopoietic Stem Cell Transplantation

Cheryl Rodgers, RN, MSN, CPNP, CPON<sup>®</sup>, Patricia Wills-Alcoser, RN, MSN, CPNP, Rebecca Monroe, RN, MSN, CPNP, Lisa McDonald, RN, MSN, CPNP, Melisa Trevino, RN, MSN, CPNP, and Marilyn Hockenberry, PhD, RN-CS, PNP, FAAN

**Purpose/Objectives:** To identify growth patterns and gastrointestinal (GI) symptoms in pediatric patients during the first four months after hematopoietic stem cell transplantation (HSCT) and to assess whether an association exists between acute graft-versus-host disease (GVHD) and growth pattern changes or GI symptoms.

**Design:** A prospective, longitudinal cohort design.

**Setting:** A tertiary children's hospital in a metropolitan area in the southern United States.

**Sample:** A convenience sample of 35 pediatric patients receiving allogeneic HSCT.

**Methods:** Anthropometric measurements were obtained and GI symptoms were surveyed in pediatric patients before HSCT and two and four months after HSCT.

**Main Research Variables:** GI symptoms, anthropometric measurements, and presence or absence of acute GVHD.

**Findings:** All anthropometric measurements showed a significant change over time; height showed an increase, and weight, skinfold triceps, and mid-arm circumference showed a decrease over the four-month measurement period. Eight GI symptoms were prevalent over the four months, and the mean severity and distress scores fluctuated minimally during that time. No statistically significant differences were noted in any of the anthropometric measurements or GI symptoms between pediatric patients with and without GVHD.

**Conclusions:** Pediatric patients in the study exhibited poor growth patterns during the four months after HSCT and experienced multiple GI symptoms before and after HSCT.

**Implications for Nursing:** Nurses should be aware of the importance of evaluating growth and symptom experience in all pediatric patients during HSCT recovery and assist in defining treatment plans that will optimize patient health.

## Key Points . . .

- ▶ Pediatric patients are exposed to multiple conditions after hematopoietic stem cell transplantation (HSCT) that leave them susceptible to malnutrition, exhibited by poor growth and persistent gastrointestinal (GI) symptoms.
- ▶ Pediatric patients in this study experienced multiple GI symptoms and had a significant loss of adipose tissue, muscle mass, and weight four months after HSCT.
- ▶ Nurses should perform a thorough nutritional assessment on all pediatric patients recovering from HSCT to determine effective nursing interventions that optimize nutritional health and improve health and quality of life.

HSCT from a variety of issues, including poor oral intake, drug toxicity, altered absorption, and increased metabolic demands as a result of medical complications such as graft-versus-host disease (GVHD) and infection (Muscaritoli, Grieco, Capria, Iori, & Rossi Fanelli, 2002; Sigley, 1998). The purpose of the current study was to identify growth patterns and gastrointestinal (GI) symptoms in pediatric patients during the four months after HSCT and to assess whether an association exists between acute GVHD and growth pattern changes or GI symptoms. The research focused on the growth patterns, the frequency and severity of GI symptoms, and whether an association exists between GVHD and growth pattern changes or GI symptoms four months after HSCT.

*Cheryl Rodgers, RN, MSN, CPNP, CPON<sup>®</sup>, Patricia Wills-Alcoser, RN, MSN, CPNP, Rebecca Monroe, RN, MSN, CPNP, Lisa McDonald, RN, MSN, CPNP, and Melisa Trevino, RN, MSN, CPNP, are pediatric nurse practitioners; and Marilyn Hockenberry, PhD, RN-CS, PNP, FAAN, is the director of the Pediatric Nurse Practitioner Program, all at the Texas Children's Cancer Center and Hematology Service in Houston. Research was funded by an ONS Foundation Symptom Assessment and Management research grant, supported by Ortho Biotech Products, L.P. (Submitted August 2007. Accepted for publication October 15, 2007.)*

Digital Object Identifier: 10.1188/08.ONF.443-448

Children require adequate nutrition for normal growth, development, and good health. Pediatric patients with chronic illnesses have additional nutritional needs from the demands of their disease and treatment. Malnutrition in the pediatric oncology population occurs in 8%–32% of patients (Han-Markey, 2000). Malnourished pediatric patients are predisposed to poor disease outcomes, decreased immune function, decreased quality of life, and poor growth and development (Han-Markey). Pediatric patients undergoing hematopoietic stem cell transplantation (HSCT) are exposed to similar risks as the pediatric oncology group; however, limited research has been performed to evaluate their long-term nutritional issues. Pediatric patients are at risk for long-term malnutrition after