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Hematopoietic stem cell transplantation in qatar: One-year anniversary

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Abstract
Hematopoietic stem cell transplantation (HSCT) offers potentially curative therapy for many hematologic and nonhematologic conditions. As a successful outcome of Qatar's National Cancer Strategy, the HSCT program was started in the National Center for Cancer Care and Research (NCCCR) in October 2015. The HSCT program in NCCCR is the only transplant program in Qatar and self-sufficient with all three core components: the stem cell collection facility, the stem cell processing facility, and the clinical program, which are locally available at Hamad Medical Corporation. In this paper, we report on the outcomes of the first 16 patients who underwent autologous stem cell transplantations (ASCTs) in our center. A total of 17 ASCT have been performed for 16 adult (≥14 years) patients. Thirteen of the 16 patients were eligible for disease evaluation at Day 100 post-ASCT. Among these patients, the overall response rate on Day 100 was 92% (complete remission, 61%; very good partial remission/partial remission, 31%) and stable disease occurred in 6%. The procedure was very well tolerated by all patients. At the time of writing this report, all patients are alive; however, one patient (6%) had disease relapse. The Day 100 post-ASCT nonrelapse mortality rate was 0%. Launching the HSCT program represents a historic milestone in the development of the health-care sector in Qatar. The 1st year of this program was very fruitful with the accomplishment of 17

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successful transplants. We are in the process of starting the allogenic HSCT early next year. This would represent the next significant milestone for cancer care in Qatar.

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Introduction

The State of Qatar comprises a peninsula located in the Arabian Gulf and some surrounding small islands. As of October 2016, the population of Qatar was estimated to be 2,611,522 [1]; 75% of the population is male, with expatriates forming the majority. Qatar has a relatively young population structure; almost one-quarter is in the 0–14 age group, and only 3% is ≥65 years. Qatar has a surface area of 11,521 km^2, with approximately 560 km of coastline [2]. Qatar is a high-income country, with a gross domestic product per capita of US$60,733 [2].

Advancing health care is an integral part of realizing the Qatar National Vision (QNV) 2030. The health-care system in Qatar is rapidly advancing and at the center of this is cancer care. Qatar's 5-year National Cancer Strategy was developed and launched in 2011 to set out in detail the actions including those required of health professionals in delivering the QNV 2030. The aim of the National Cancer Strategy is to reduce the incidence of cancer in Qatar, and to deliver the very best diagnosis and care for cancer patients.

Hematopoietic stem cell transplantation (HSCT) is a potentially curative therapeutic modality for many hematologic and nonhematologic conditions. As a successful outcome of Qatar's National Cancer Strategy, the HSCT program was started in National Center for Cancer Care and Research (NCCCR), a leading cancer hospital in Qatar, at Hamad Medical Corporation (HMC), which is the principal public health-care provider in Qatar, in October 2015. As we celebrate the 1-year anniversary of the program, we herein report on the outcomes of the first 16 patients who underwent autologous stem cell transplantations (ASCTs) in our center.

Patients and methods

Since October 2015, 17 ASCTs have been performed for 16 adult (≥14 years) patients; one patient with multiple myeloma had two transplants. Patients < 60 years of age were eligible for ASCT. All patients according to our protocol had a detailed comprehensive evaluation prior to ASCT to ensure adequate cardiac, pulmonary, renal, and hepatic functions. Baseline demographics, clinical and laboratory data at the time of transplant, and information on treatment and response were collected prospectively and recorded in the European Society for Blood and Marrow Transplantation (EBMT) data collection forms. Written informed consents for the procedure and data collection were obtained from all patients.

The International Myeloma Working Group Uniform Response Criteria were applied for evaluation of disease status and response for multiple myeloma [3]. Lugano classification was applied for initial evaluation, staging, and response assessment for Hodgkin's lymphoma and non-Hodgkin's lymphoma [4].

The HSCT program in NCCCR is the only transplant program in Qatar and self-sufficient with all three core components, namely, the stem cell collection facility, the stem cell processing facility, and the clinical program, which are locally available at HMC. The clinical HSCT unit at NCCCR consists of five transplant beds in positive pressure, high-efficiency particulate air-filtered rooms.

Concomitant with the growth of the clinical program has been the development of state-of-the-art transplant laboratory facilities. The stem cell collection facility is part of HMC National Transfusion Medicine Department. The department provides universally leukodepleted (residual < 1E6) red blood cells, platelets, and plasma prepared on the Terumo BCT Reveos system (Tokyo, Japan) for automated component production. All platelets and plasma are pathogen inactivated using riboflavin (Terumo BCT Mirasol). Red blood cells are generally provided as irradiated products. Irradiation is no longer performed on platelet components. All platelets are suspended in platelet additive solution. The harvested hematopoietic stem cells are processed in the Cellular Therapy Laboratory (CTL) of HMC located at NCCCR. The GMP-CTL is a state-of-the-art facility that aims to provide modern forms of cell therapies for clinical use. The collected stem cells are cryopreserved using a controlled rate freezing procedure. Cryo-bags were stored in LN2 biofreezers at temperatures below −150 °C. Total nucleated cells were enumerated on an automated hematology analyzer and $CD34^+$ cells were enumerated in duplicate on a flow cytometer (BD FACSCanto II, BD Biosciences, San Jose, CA, USA). Cells were thawed at the