Transfusion and Apheresis Science 50 (2014) 200–206

Contents lists available at ScienceDirect

Transfusion and Apheresis Science

journal homepage: www.elsevier.com/locate/transci

Review

Central venous catheter insertion in peripheral blood hematopoietic stem cell sibling donors: The SIdEM (Italian Society of Hemapheresis and Cell Manipulation) point of view

Michele Vacca [a], Paolo Perseghin [b], Patrizia Accorsi [c], Luca Pierelli [a,*], On the behalf of SIdEM Board

[a] Immunohematology and Transfusion Unit, Azienda Ospedaliera San Camillo-Forlanini and Università di Roma-La Sapienza, Rome, Italy
[b] Therapeutic Apheresis and Criobiology Unit, SIMT, San Gerardo Hospital, Monza, Italy
[c] Immunohematology and Transfusion, Apheresis Unit, Azienda Ospedaliera Santo Spirito, Pescara, Italy

ARTICLE INFO

Article history:
Received 20 October 2013
Received in revised form 2 February 2014
Accepted 5 February 2014

Keywords:
PBSC collection
Sibling donors
Central venous catheters

ABSTRACT

Collection of peripheral blood hematopoietic stem cells (PBSC) is the practice of choice for graft procurement in both autologous and allogeneic setting. The success of this procedure depends on the use of adequate vascular accesses. Well-sized peripheral veins are the first option in autologous and allogeneic donations. In autologous setting, in case of lack of adequate veins, central venous catheters (CVC) may be used for collection. In the allogeneic setting, although available data have shown the safety of the use of CVC, there are still some controversies about the possible insertion of a CVC in donors. A specific policy from competent registries is usually applied in the different countries to regulate the use of CVC in unrelated donors. In siblings, the question is still undefined due both to the lack of shared guidelines and to the specific characteristics of this donation. In fact, in not so rare cases, larger stem cell doses for specific cell manipulations (e.g., T/B cell depletion in the haploidentical setting) are needed. The lack of international rules or standard that forbid the use of a CVC in siblings and published data that document the safety of this procedure, allowed the Società Italiana di Emaferesi e Manipolazione Cellulare (SIdEM) national Board to identify a possible, shared, operational approach to address this issue by a case-specific risk–benefit assessment.

Contents

1. Introduction 201
2. Rules and standards in the field 201
(1) FACT–JACIE international standards fifth edition (March 2012) 202
(2) Guidelines for the blood transfusion service in the UK (eight edition, February 2012) 202
(3) National Marrow Donor Program (twenty-first edition, October 2011) 202

* Corresponding author. Address: Transfusion Department, San Camillo Forlanini Hospital, Circonvallazione Gianicolense 87, 00152 Rome, Italy. Tel.: +39 0658703288; fax: +39 0658704496.
E-mail address: lpierelli@me.com (L. Pierelli).

http://dx.doi.org/10.1016/j.transci.2014.02.001
1473-0502/

(4) Standard AABB (sixth edition, July 2013) . . . 202
(5) World Marrow Donor Association (WMDA) . . . 202
3. Data from literature . . . 202
4. Discussion and conclusions . . . 204
Acknowledgments . . . 206
References . . . 206

1. Introduction

In the context of blood component collection procedures that employ blood cell separators, specifically in case of cytoapheresis, the insertion of a short-term, double-lumen central venous catheter (CVC) allows collection of leukocytes or peripheral blood stem cells (PBSC) also in patients and donors who have not proper peripheral veins [1]. In cases of cytoapheresis, in fact, proper vascular accesses should consent a blood flow-rate of about 40/50 ml per minute for both inlet and return lines. During PBSC collection, blood flow-rate is a key factor which improves collection efficiency and speed (in terms of length of a single procedure) and this is true for most of the available blood cell separators. In fact, a consistent and regular blood flow-rate is required for a correct cell stratification into the separation chamber and then for its collection, when PBSC are pumped off into the harvesting bag.

A way to guarantee an optimal cell separation is the availability of proper venous accesses, which may consist of adequate peripheral venous accesses, of a combination of a peripheral vein for the inlet line and a long-term CVC for the return line or of a well-sized, double-lumen CVC placed in the femoral vein or, in some cases, in the jugular or subclavian veins. The insertion of these short-term catheters is generally accomplished by qualified operators such as expert hematologists or nephrologists, well-trained with CVC due to their routine activity in dialysis, apheresis and intensive-care units, or by anesthetists and surgeons. The insertion of a CVC for PBSC collection in the autologous setting is a routine procedures for patients who lack proper peripheral veins, even in cases of thrombocytopenia or clotting deficiency which may be treated by adequate supportive measures prior to CVC placement. A possible limitation may exist in those patients with previous thrombotic symptoms who need specific and continuous prophylaxis or who require a complex antiaggregant therapy. In our country, and more in general in Europe, there is not a specific consensus on the use of CVC in healthy donors of PBSC. In fact the argument is matter of controversy due to several reasons:

I. The insertion of a CVC in a healthy subject may provoke serious complications such as infection and thrombosis.
II. The management of a CVC might require hospitalization when a donor must undergo multiple apheresis procedures, strongly reducing comfort of donors.
III. The lack of proper venous accesses and the decision to avoid a CVC, may collide with the donor's choice to donate circulating PBSC; additionally, it affects the transplant procedure due to the shift to marrow donation which is a complex procedure, requires general narcosis and hospitalization, and collects less PBSC, particularly in those donor/patient couples with evident weight disparity against the patient.
IV. In the setting of haploidentical donors, some protocols are based only on circulating, manipulated PBSC grafts and not on bone marrow cells, due to the need of larger doses of stem cells.
V. In the specific setting of sibling .donors, an exceptional donor enrollment may be considered to assure a perfectly matched graft to patients who require transplantation in a proper time interval; thus, siblings with previous fully recovered thrombotic events, not excluding at all enrollment for stem cell donation (for instance, thrombosis occurred following a trauma or leg venous flow deficiency) or undergoing primary thrombo-ischemic prophylaxis by low-dose aspirin could be considered for PBSC collection with an increased risk of vascular or bleeding events, respectively, in case of CVC placement.

In general, the chance of CVC insertion in an unrelated donor is regulated by policies of national registries. This is the case of Italy, where the Italian Bone Marrow Donor Registry (IBMDR) forbids the use of CVC in unrelated donors. In the context of familiar donors, when a given donor represents the best donor for a patient, all the issues exposed in points (I) to (V) seem particularly true. A recent approach proposed by the Societa' Italiana di Immunoematologia e Medicina Trasfusionale (SIMTI) and Gruppo Italiano Trapianto di Midollo Osseo (GITMO) (http://www.simti.it/linee_guida.aspx?ok=1) discourages the use of CVC also in sibling donors and this position, unsupported by any form of objective evidences or reported data, creates some relevant questions for the following reasons:

A. What already mentioned above in points (III) and (IV).
B. It leaves alone the staff of the Collection/Apheresis unit in a decision which may change the donation modality of the donor, with possible additional risks of adverse events for the donor himself, and that may affect transplantation due to use of less abundant and/or unplanned source of hematopoietic stem cells (HSC).

2. Rules and standards in the field

To date, there are not European or national directives or laws that forbid the use of a CVC in sibling donors of PBSC. Current international standards or guidelines consider with