Tracing stem cells after transplantation

Published: 25-02-2019
Last updated: 15-05-2024

Hematopoiesis after transplantation is supported by a limited number of HSCs, and the proliferative stress posed upon these cells compromises their long-term genomic and functional integrity,

Ethical review	Not applicable
Status	Pending
Health condition type	-
Study type	Observational non invasive

Summary

ID

NL-OMON23273

Source
Nationaal Trial Register

Brief title
Tracing stem cells after transplantation

Health condition

Allogeneic hematopoietic stem cell transplantation

Sponsors and support

Primary sponsor: Princess Máxima Center for Pediatric Oncology
Source(s) of monetary or material Support: Princess Máxima Center for Pediatric Oncology

Intervention

Outcome measures

Primary outcome

Main study endpoints are: (1) The total number of somatic mutations acquired after HSCT in the HSCT recipient and his/her donor; (2) The frequency of HSC clones contributing to

production of each of the mature blood lineages in the HSCT recipient and donor.

Secondary outcome

Secondary outcomes are: (3) Identification of potential causes of HSC mutagenesis upon HSCT; (4) Generation of an experimental method to retrospectively assess the impact of common clinical parameters (donor age, conditioning regimen, etc) on HSC integrity.

Study description

Background summary

Hematopoietic stem cell transplantation (HSCT) is a last-resort curative therapy for patients suffering from various, otherwise lethal, diseases. The success of this therapy relies critically on adminstration of sufficient numbers of donor HSCs. However, due to lack of strategies to count and trace human HSCs, the number of engrafting HSCs and their long-term contribution to hematopoiesis remain elusive. Here, we will use innovative technology, which employs single-cell analysis of naturally occurring genetic mutations to retrospectively reconstruct the number of HSCs clones, their quantitative contributions to each of the mature blood lineages and their mutational burden in human allo-HSCT recipients and their donors. This is a fundamental, observational study. We will include 10 HSCT recipients transplanted at pediatric age, and their healthy donors. The study intervention is a single blood collection of 10 mL venous blood.

Study objective

Hematopoiesis after transplantation is supported by a limited number of HSCs, and the proliferative stress posed upon these cells compromises their long-term genomic and functional integrity,

Study design

One randomly selected time point after HSCT

Intervention

N/a

Contacts

Public

Princess Máxima Center for Pediatric Oncology
Mirjam Belderbos

0650006518
Scientific
Princess Máxima Center for Pediatric Oncology
Mirjam Belderbos

0650006518

Eligibility criteria

Inclusion criteria

(1) Allogeneic HSCT with bone marrow cells from a healthy sibling donor; (2) Age at HSCT <18 yrs; (3) First HSCT; (4) Availability of viably frozen donor bone marrow cells from the Biobank of the UMC Utrecht; (5) >95% donor chimerism; (6) No major HSCT-related complications (see exclusion criteria).

Exclusion criteria

(1) Major HSCT-related complications, such as >grade 2 graft versus host disease; (2) Secondary graft failure; (3) Objection to be notified about actionable findings from whole-genome sequencing; (4) Failure of the HSCT recipient, donor and/or their legal representatives to understand the patient information and informed consent form (either due to intellectual disability or to language problems). Of note: Only include subjects in whom both the HSCT recipient and his/her donor (and, if applicable, their caregivers) agree to participate in the current study are eligible.

Study design

Design

Study type:	Observational non invasive
Intervention model:	Other
Allocation:	Non controlled trial

Control: N/A , unknown

Recruitment

NL

Recruitment status:	Pending
Start date (anticipated):	01-04-2019
Enrollment:	20
Type:	Anticipated

IPD sharing statement

Plan to share IPD: No

Ethics review

Not applicable

Application type:	Not applicable

Study registrations

Followed up by the following (possibly more current) registration

ID: 54736
Bron: ToetsingOnline
Titel:

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
NTR-new	NL7585
CCMO	NL68140.041.19
OMON	NL-OMON54736

Study results