Thrombosis and Thrombophilia

Contents

This page was last modified on 1 November 2016, at 13:29.

Condition

Thrombosis and thrombophilia

Name of conditions

(History of) Thrombosis, examples of conditions:

Deep Venous Thrombosis (DVT)

Pulmonary Embolism (PE)

Portal Vein Thrombosis

Renal Vein Thrombosis

Jugular Vein Thrombosis

Budd Chiari Syndrome

Paget-Schroetter disease

Cerebral venous sinus thrombosis

Arterial thrombosis (causing infarction)

Thrombophilia: a congenital or acquired tendency to (abnormal) formation of clots in veins and arteries, examples of conditions:

Factor V Leiden

Factor II mutation

Antithrombin III deficieny

Protein C deficiency

Protein S deficiency

(History of) Antiphosholipid syndrome

Pregnancy

Paroxysmal Nocturnal Hemoglobinuria (PNH)

Several other hematologic diseases such as sickle cell disease and myeloproliferative disorders

Individual at risk

Donor and (in case of genetic disorder/ predisposition) recipient

Guidance at RECRUITMENT for adult volunteer donor (NA for maternal donor (cord blood donation))

ACCEPTABLE if single provoked deep vein thrombosis in the leg (e.g. secondary to trauma, pregnancy or immobilisation), the donor has been fully evaluated to exclude an underlying pathology (including inherited thrombophilia), and the donor has completed the required course of anticoagulant therapy

Otherwise DEFER.

Guidance at CT/WORK-UP

Donors with any history of a single provoked deep vein thrombosis should be carefully reviewed on a case-by-case basis before deciding to proceed with donation.

Donors with any other form of thrombosis or recurrent thrombosis should not donate.

Justification for guidance

The impact of rhG-CSF treatment on the coagulation system has been evaluated in detail. Falanga et al. reported an impact of rhG-CSF on hemostasis in normal donors. They showed an increase in plasma markers of endothelial activation (thrombomodulin and von Willebrand factor antigens) and blood coagulation activation [F1þ2, thrombiantithrombin III (TAT) complex, D-dimer], as well as endotoxin-induced mononuclear cell procoagulant activity. These changes were largely resolved one week after stopping treatment. Topcuoglu et al. reported similar findings. Leblanc et al. found increased levels of factor VIII:C and thrombin generation in normal donors after rhG-CSF administration. Sohngen et al. detected increased factor VIII and fibrinogen levels, while protein C and protein S activities were reduced.

These data suggest that rhG-CSF may induce a transient prothrombotic or hypercoagulable state in donors. Surgery (in bone marrow donation) is a well-known risk factor for thrombosis. A publication by Halter et al. in 2009 reported of several severe events and one death as a consequence of thombotic events in (related) donors donating bone marrow as well as PBSC.

This conclusion has lead to a generally accepted policy to defer donors with (risk factors or a predisposition to) thrombotic events. In publications of registries using this policy no thrombotic events in healthy donors were described (Pulsipher et al).

References

Anderlini P. Effects and safety of granulocyte colony-stimulating factor in healthy volunteers. Current Opinion in Hematology 2009, 16:35–40

LeBlanc R, Roy J, Demers C, et al. A prospective study of G-CSF effects on hemostasis in allogeneic blood stem cell donors. Bone Marrow Transpl 1999; 23:991–996.

Falanga A, Marchetti M, Evangelista V, et al. Neutrophil activation and hemostatic changes in healthy donors receiving granulocyte colony-stimulating factor. Blood 1999; 93:2506–2514.

Topcuoglu P, Arat M, Dalva K, et al. Administration of granulocyte-colony stimulating factor for allogeneic hematopoietic cell collection may induce the tissue factor-dependent pathway in healthy donors. Bone Marrow Transp 2004; 33:171–176.

Sohngen D, Wienen S, Siebler M, et al. Analysis of rhG-CSF-effects on platelets by in vitro bleeding test and transcranial Doppler ultrasound examination. Bone Marrow Transpl 1998; 22:1087–1090.

Halter J, Kodera Y, Ispizua AU, et al. Severe events in donors after allogeneic hematopoietic stem cell donation. Haematologica 2009; 94(1): 94-101.

Pulsipher MA, Chitphakdithai P, Miller JP, et al. Adverse events among 2408 unrelated donors of peripheral blood stem cells: results of a prospective trial from the National Marrow Donor Program. 2009 113: 3604-3611.

Notes

There was some disagreement within the review committee regarding the acceptability of donors who have had a single episode of provoked DVT.