



Superior Health Council

Rue de l'Autonomie 4
1070 Bruxelles

Guidelines for the transfusion of platelets (SHC 8068)

Validated by the Transitional Board on July 13th, 2005

I. Request:

Self-initiated project.

II. Advisory report:

Executive summary

Assignment

1. Organising an expert meeting on the indications for platelet transfusions.
2. Collecting recent knowledge on the subject of platelet transfusion.
3. Drawing up guidelines for the transfusion of platelets.

Assignment 1

The Superior Health Council (SHC) set up a working group, which met on several occasions in 2004 in order to prepare the expert meeting devoted to "Guidelines for the transfusion of platelets". This conference, which was held in collaboration with the "Belgian Haematological Society", took place at the Brussels "Cliniques universitaires Saint-Luc" on November 19th, 2004. Three speakers discussed the indications for platelet transfusions, the ideal platelet concentrate and the subject of optimising platelet transfusion therapy, respectively.

Assignment 2

Collecting recent knowledge on the subject of platelet transfusion was performed in several steps: on the one hand, there were papers and subsequent discussions, followed by the final discussion of the meeting; on the other, there were (a) the preparation of guidelines for the transfusion of platelets by the rapporteurs and (b) the validation of the recommendations proposed by the speakers, the chairmen and the members of the working group "Blood and Blood Products" of the SHC.

Assignment 3

The working group has been able to draw up a substantial series of recommendations aiming at standardising and rationalising clinical indications for the transfusion of platelets in Belgium. These recommendations are included in the report entitled "Guidelines for the transfusion of platelets", which can be found in the appendix to this advisory report.

1. Introduction.

Transfusions are a necessary part of healthcare: not only are they needed when dealing with medical and surgical emergencies (road accidents, burn victims,...), they are also required for planned surgical operations and supportive therapy aiming at improving the treatment administered to the recipient (leukaemia patients, haemophiliacs, ...). In 1997, 547.353 units of red blood cell concentrates and 191.513 units of platelet concentrates were distributed in Belgium. For 2003, the number of units of red blood cell concentrates that were distributed totals 480.007, the number of platelet concentrate units amounting to 254.432. The scale and constant increase in the therapeutic use of human blood and blood products, both for standard and experimental use, have made it necessary to develop guidelines for the optimal use of these products. These recommendations aim at guaranteeing a safe, permanent supply in accordance with ethical rules, as well as ensuring an adequate and rational use of the donated blood.

The "transfusion committees", which have been set up in hospitals as a result of the Royal Decree of April 16th, 2002, must closely monitor the use of each blood component in any given hospital. This surveillance, as well as the large-scale studies carried out in some European countries, reveals that hospitals exhibit a great lack of consistency with respect to the indications for transfusions. Finally, if strict rules are implemented in the institutions that carry out transfusions, a particular effort will also be required to standardise and rationalise clinical indications.

In order to remedy these divergences and to provide a scientific basis to the transfusion committees, the Superior Health Council has organised an expert meeting on platelets in collaboration with the "Belgian Haematological Society". This meeting was designed to collect recent knowledge on the subject of platelet transfusion and its alternatives in order to enhance the harmonisation of transfusion practice in Belgium.

2. The expert meeting "Guidelines for the transfusion of platelets".

This expert meeting was held at the Brussels Cliniques Universitaires Saint-Luc on November 19th, 2004. Its aim was to rationalise the prescription of platelets by providing guidance for practitioners in their decision-forming processes, thus enhancing the quality of transfusions and providing help in the homogenising practice. In order to achieve this goal, the organising committee gleaned the most relevant contributions from the literature and asked that, in preparing their papers, three speakers pay particular attention to the available meta-analyses and the "evidence-based medicine" approach. Moreover, the speakers were asked to clearly identify any opinions of their own. A printed version of the papers was given to two chairmen (D. Selleslag, Bruges, and M. Toungouz, Brussels) and two rapporteurs (A. Bosly, Mont-Godinne, and L. Muylle, Mechelen) in order to enable them to prepare the discussions, for which a large amount of time had been programmed.

There were three papers, each on a highly specialised subject:

1. "Indications for platelet transfusion" (L. Noens, Gent)
2. "The ideal platelet concentrate" (R. Pietersz, Amsterdam)
3. "Optimising platelet transfusion therapy" (D. Heim, Basel)

Each paper was immediately followed by an in-depth discussion of the analyses put forward. Next, after the discussion following the set of papers, each recommendation suggested was re-examined and assessed during an intense exchange involving both the experts and the doctors in charge of transfusions who attended the meeting.

The invitations for the meeting were widely distributed in the medical world, resulting in the attendance of as many as 80 participants.

3. Recommendations.

Thanks to this meeting, it was possible to set up guidelines for the transfusion of platelets. These reflected the valuable expertise of the rapporteurs, who based them both on the analyses outlined in the papers and on the arguments or opinions expressed during the discussions.

Next, the speakers, the chairmen and the members of the working group "Blood and Blood Products" of the SHC made comments on this document and produced a final version, which was approved during the meeting of May 19th, 2005 (reference a; appendix to this advisory report).

The following conclusions were mentioned in this report:

- a) Platelet transfusion improves haemostasis in thrombocytopenic patients.
- b) Platelet transfusions are indicated in case of bleeding in thrombocytopenic patients except in case of thrombocytopenic thrombotic purpura or heparin-induced thrombocytopenia.
- c) Prophylactic platelet transfusions are indicated as a means of preventing and reducing bleeding in patients at risk (after chemotherapy, after haematopoietic cell transplantation and stem cell transplantation).
- d) In the absence of adverse factors (fever, hyperleukocytosis, coagulation problems, rapid fall of the platelet count), 10,000 platelets/ μ L is the recommended threshold for prophylactic platelet transfusion.
- e) A platelet count of 50,000/ μ L is required for the majority of invasive procedures in thrombocytopenic patients. Insertion of central line catheters and transjugular liver biopsy can be performed with platelet counts \geq 30.000/ μ L. Bone marrow aspirations or bone marrow biopsy do not require prophylactic platelet transfusion.
- f) No firm recommendation can be given on the dose required for prophylactic platelet transfusion. However, the standard platelet transfusion contains 4×10^{11} platelets and the dose and timing should be adjusted to the clinical situation and the platelet count.
- g) Transfusions of stored platelet concentrates are efficient up to 5 days and, under appropriate storage conditions, up to 7 days of their shelf life.
- h) Storage of platelet concentrates up to 7 days requires the detection or reduction of potential bacterial contamination (Royal decree February 1st, 2005, art. 9, 2^o).
- i) The quality of multiple donor platelet concentrates ("platelet pool") is equivalent to single donor platelet concentrates.
- j) Patients should receive ABO-compatible platelet concentrates and where possible ABO identical platelet concentrates.
- k) Compatible non-identical platelet concentrates should only be used if tested and found negative for high titre anti-A/B or if suspended in a PAS storage solution.
- l) Transfusion of ABO incompatible platelets results in reduced efficacy and should be avoided.
- m) RhD-negative patients, and in particular women up to the age of 45, should receive, where possible, RhD-negative platelet concentrates.
- n) If the transfusion of RhD-positive platelet concentrates to an Rh-D-negative woman of childbearing potential cannot be avoided, a dose of 300 i.u. anti-D immunoglobulins must be administered (by intramuscular or subcutaneous injection). One dose should be sufficient to cover the transfusion of 5 platelet concentrates over a 6-week period.
- o) The response to a platelet transfusion should be monitored.
- p) Refractoriness should be diagnosed if at least two ABO-compatible platelet transfusions result in an unsatisfactory corrected count increment (CCI). A CCI is considered satisfactory if it is higher than 7.5 10 minutes to one hour after the transfusion.

- q) When platelet refractoriness is noted, clinical factors associated with a decreased outcome of platelet transfusion should be assessed.
- r) In the absence of apparent clinical factors, it is advisable to try and detect an immune cause, especially the presence of anti-HLA antibodies. The testing should include screening for cytotoxic as well as non-cytotoxic anti-HLA antibodies.
- s) For patients with alloimmune refractory thrombocytopenia compatible platelet donors should be selected in order to improve transfusion responses.
- t) The selection can be based on platelet-crossmatch techniques or on HLA-A and HLA-B antigen matching (best match). In one study, it was reported that in case of multispecific anti-HLA antibodies HLA-matching was superior to platelet-crossmatching.
- u) Additional causes for refractoriness such as platelet consumption and anti-HPA antibodies should be considered if HLA-matched platelet concentrates do not result in a satisfactory CCI in alloimmunised patients.
- v) The development of anti-HPA antibodies is a rare cause of refractoriness. Anti-HPA antibodies are very rarely found in sera without anti-HLA antibodies whereas six to twenty-five percent of sera containing anti-HLA antibodies may also contain anti-HPA antibodies but their role in refractoriness needs further examination.
- w) There is no evidence that alloimmunised patients benefit from non-matched prophylactic platelet transfusions that do not produce satisfactory posttransfusion increments.
- x) Prestorage leukocyte depletion of platelets reduces anti-HLA alloimmunisation.

III. Composition of the working group that was involved in drawing up these guidelines:

- Baele Philippe
- Bontez Walter
- Cras Patrick
- Desmyter Jan
- Dobbelaer Roland
- Ferrant Augustinus
- Goubau Patrick
- Lambermont Micheline
- Latinne Dominique
- Plum Jean
- Muylle Ludo
- Sondag-Thull Danièle
- Steenssens Laurette
- Thomas Isabelle
- Van Ranst Marc
- Voets Ellen

This working group was chaired by Mrs. SONDAG-THULL D, the scientific secretariat was carried out by Mr. DUBOIS J-J. and HÜBNER R.

IV. References:

- a) Report « *Guidelines for the transfusion of platelets* » May 19th, 2005, 13 pages.
