Superior Health Council

ADVISORY REPORT OF THE SUPERIOR HEALTH COUNCIL

Guidelines for the transfusion of red cells

10 January 2007

SHC no 8085

1. INTRODUCTION AND ISSUES

Some 500,000 units of red cell concentrates are distributed in Belgium on a yearly basis. The extensive use made of human blood and of blood products for therapeutic purposes, as well as the wide discrepancies that can be observed amongst Belgian hospitals in their transfusion practice, have made it necessary to develop guidelines for the optimal use of these products. The recommendations made by these programmes aim at guaranteeing a safe, permanent supply in accordance with ethical rules, as well as ensuring an adequate and rational clinical use of the donated blood.

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 surgical operations and therapies aiming at improving the health of the recipient (leukaemia patients, haemophiliacs…). Transfusion Committees have been set up in Belgian hospitals as a result of the Royal Decree of April 16th, 2002 and have been ordered to draw up transfusion guidelines for hospitals. In addition, these Committees closely monitor the use of every blood component in the hospital. This surveillance, as well as 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 (SHC) has organised an expert meeting on red cells with the *Belgian Hematological Society*. This meeting was designed to collect the most recent knowledge on the subject of red blood cell transfusion and its alternatives in order to enhance the harmonisation of transfusion practice in Belgium. Thus, the Superior Health Council is required to draw up a series of rules concerning the correct administration of blood or blood products, in keeping with article 3 of the law of July 5th, 1994 on blood and blood products of human origin, modified by the programme law of April 8th, 2003, Chap. X, Art 158.

These issues were discussed during the meetings of the working group “blood and blood products” that took place on June 22nd, September 21st and November 23rd, 2006. The provisional advisory report of the members of the working group was approved on December 18th, 2006 and validated by the SHC Board on January 10th, 2007.

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Assignment

1. The organisation of an expert meeting on the indications for red cell transfusions;

2. The assessment of the most recent knowledge on the subject of red cell transfusion;

3. Draw up guidelines for the transfusion of red cells.

2. CONCLUSIONS

Assignment 1. The Superior Health Council (SCH) set up a working group, which met on several occasions in 2005 in order to prepare the expert meeting devoted to "*Guidelines for the transfusion of red cells*". This conference, which was held in collaboration with the *Belgian Hematological Society*, took place in Brussels on November 18th, 2005. Five speakers discussed the indications for red cell transfusions, the ideal red cell concentrate, the practical issues of administering red cells, and the carrying out of red cell transfusions in patients in a critical condition.

Assignment 2. Assessing the most recent knowledge on the subject of red cell transfusions was performed in numerous 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 transfusion guidelines by the rapporteurs and (b) the validation of the recommendations proposed by 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 red cells in Belgium. These recommendations are included in the report entitled "*Guidelines for the transfusion of red cells*", which is to be published in a scientific journal.

3. FURTHER DETAILS AND ARGUMENTATION

a) *The organisation of an expert meeting on the indications for red cell transfusions*

The expert meeting "*Guidelines for the transfusion of red cells*" was held in Brussels on November 18th, 2005. Its aim was to rationalise the prescription of red cells by providing guidance for practitioners in their decision-forming processes, thus enhancing the quality of transfusions and providing help in homogenising the practice under discussion. In order to achieve this goal, the organising committee gleaned the most relevant contributions from the literature and asked that, in preparing their papers, five 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 (M. Lamy, Liège, and Z. Berneman, Antwerp) and two rapporteurs (Ph. Baele, Brussels and L. Muylle, Brussels) in order to enable them to prepare the discussions, for which a large amount of time had been programmed.

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

1. "*Red cell transfusion in Belgium: Past, Present and Future*" (L. Noens, Ghent);
2. "*The ideal red cell concentrate*" (H. Gulliksson, Stockholm);
3. "*Transfusion of red cells: Practical Aspects*" (A. Brand, Leiden);
4. "*The medical indications for red cell transfusion*" (J. Isbister, Sydney);
5. "Clinical use of red cells in critical patients: Surgery & Intensive Care" (Ph. Van der Linden, Brussels).

b) The assessment of the most recent knowledge on the subject of red cell transfusion

Each paper was immediately followed by an in-depth discussion of the analyses put forward. Next, during 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.

Thanks to this meeting, it was possible to set up guidelines for the transfusion of red cells. These reflected the expertise of the members of the working group "blood and blood products" of the SHC, who based them both on the analyses outlined in the papers and on the arguments or opinions expressed during the discussions on the report, which goes into the details of the principles behind red cell transfusions. The members of the working group adapted this document and produced a final version, which was approved on December 18th, 2006 (reference a).

c) Draw up guidelines for the transfusion of red cells

These recommendations do not provide a description of user requirements, but can be used as a means of assessing minimum standards of good practice.

1. Red cell transfusion is only one part of a global therapy aimed at correcting a lack of balance between oxygen transport and oxygen demand. Before carrying out a transfusion, it is necessary to address the question of oxygen demand as well as the other factors involved in oxygen supply, such as the oxygenation of arterial blood and cardiac output.

2. At this stage, it is impossible to make any recommendations about the transfusion of large quantities of red blood cells that have been stored for over 10 days.

3. Neonatal patients should only receive red cells that have been stored for five days or less in case of massive or exchange transfusion. Erythrocytes that have been irradiated should not be transfused any later than 24 hours after irradiation.

4. Increased oxygen delivery does not seem to require fresh rather than stored red cells.

5. Any patient who needs a transfusion should receive sufficient quantities of the required blood component in time.

6. Below 45 g/l haemoglobin, the life of the patient is in danger in the short term.
   Below 70 g/l haemoglobin, the question to ask should be: "Why not transfuse?"
   Above 70 g/l haemoglobin, the question to ask should be: "Why transfuse?"
   Between 70 and 100 g/l, cardiac and respiratory reserve play a major role in deciding whether or not to carry out a transfusion.
   Above 100 g/l haemoglobin, transfusion is rarely necessary.

7. Symptomatic patients should receive a transfusion and their symptoms should be reassessed after the transfusion. Haemoglobin concentrations will be monitored to assess

the efficacy of the transfusions. The 'target' haemoglobin concentration cannot be used to assess whether or not it is appropriate to provide care for individual patients.

8. Blood should be ordered in time. Every hospital should have Surgical Blood Ordering Schedules. There should be appropriate planning for deliveries and scheduled operations.

9. Patients must be identified on the basis of their name and surname, as well as their date of birth or patient number.

10. The correct procedure to minimize pre-analytical errors is to label blood sample tubes at the bedside of the patient only.

11. Each hospital must design a specific procedure to identify newborns in relation to their mother, effective from the very moment of birth.

12. Before releasing a compatible blood unit, the results of two patient (ABO/D) blood group determinations should be compared and found to be the same. These tests must be performed on samples from two separate collections.

13. For women under the age of 45, it is advisable to use Kell negative and Rh compatible blood.

14. Immune irregular antibodies, once detected, should always be taken into account when selecting a red cell unit.

15. Automation and computerization of pre-transfusion testing are superior to manual techniques.

16. Pre-transfusion type and screen can replace compatibility testing with the exception of preterm newborns and patients who have or have had irregular antibodies.

17. Leukocyte-depleted red cell concentrates are an acceptable alternative to red cell concentrates from CMV-seronegative donors in reducing the risk of CMV transmission. A combination of the two methods is currently advised for intra-uterine transfusions.

The recommendations above constitute one of the appendixes to the "Standards of good transfusion practice for hospitals" (SHC no 8167).

4. REFERENCES

a) Report "*Guidelines for the transfusion of red cells*" 23/11/06, 17 pages.

5. APPENDIXES

None.

6. COMPOSITION OF THE WORKING GROUP

The following experts were involved in issuing this advisory report:

- BAELE Philippe (anesthesiology);
- BONTEZ Walter (blood, tissues and cells);
- FERRANT Augustinus (clinical haematology);
- LAMBERMONT Micheline (transfusion);
- LATINNE Dominique (haematological biology);
- MUYLLE Ludo (blood, tissues and cells);
- SCHOTS Rik (haematology);
- SONDAG-THULL Danièle (transfusion);
- THOMAS Isabelle (TSE, virology);
- TOUNGOUZ Michel (immunology, haematology, transfusion);
- VANDEKERCKHOVE Bart (clinical biology, cell therapy);
- VOETS Ellen (blood and blood products, TSE, virology).

This working group was chaired by Mr. TOUNGOUZ Michel, the scientific secretary was Mr. HÜBNER Roland.