Short Comunications

Transfusion medicine competency and the fundaments for its implementation in Anesthesiology and Reanimation

Fernández Franch Neyda[1*]

Torres Romo Ubaldo Roberto[2]

Menéndez Cabezas Arturo Teodoro[2]

López Lazo Sarah Estrella[2]

Zaily Fuentes Díaz[2]

Liza Hernández Oscar[2]

[1]Camagüey University of Medical Sciences, Faculty of Odontology. Camagüey, Cuba.

[2]Camagüey University of Medical Sciences, Faculty of Medicine. Camagüey, Cuba.

[*]Author for correspondence. E-mail: neyda.cmw@infomed.sld.cu

ABSTRACT

A way to overcome the blood transfusion disadvantages is determining and developing transfusion competencies. The research aims were to identify the elements of transfusion medicine competency and to describe the fundaments for its implementation in the specialty of Anesthesiology and Reanimation. Transfusion competencies include, among others, knowledge of the risks of blood-borne infections, safe prescription of blood products, identification of transfusion reactions, and competently perform and teach undergraduates the procedure of intravenous infusion of blood and blood products. It also includes knowing and updating on ethical, scientific and legal issues of blood components transfusion. In Anesthesiology and Reanimation, transfusion medicine competency also involves demonstration of knowledge, abilities and values for the preoperative preparation of the patients with anemia, bleeding risk and other hematological illnesses, for the use of pharmacological and non pharmacological alternatives, as well as for blood components' economy. Being competent in transfusion medicine in this specialty implies an important and substantial reduction of the general morbidity-mortality and particularly that associated with transfusion complications, and requires the capacity of mobilize the set of knowledge, skills, attitudes and values in a comprehensive and pertinent way in order to transfuse less and better, with more safety and less expenditures.

Keywords: transfusion medicine; medical education; competencies; anesthesiology y reanimation.

METHODS

The research aims were to identify the components of transfusion medicine competency and to describe the fundaments for its implementation in the specialty of Anesthesiology and Reanimation.

An educational cross-sectional descriptive study was conducted at Camagüey University of Medical Sciences from March 2016 to December 2017. A detailed analysis of documentation to characterize the elements of transfusion medicine competency and fundaments for its implementation in Anesthesiology and Reanimation was made as well as the integration in the specialization program of the contents and skills of transfusion medicine, followed by interviews to professors of the specialty in the province.

RESULTS

The identified elements of transfusion medicine competency were:[1-5]

1) Prescribes blood components properly and recognizes transfusion reactions.
2) Accomplishes the principles of safe prescription of blood products.
3) Demonstrates knowledge and follows guidelines on save use of blood and blood components including awareness of religious and cultural beliefs.
4) Competently performs and teach undergraduates on the procedure of intravenous infusion of blood and blood components.
5) Demonstrates knowledge of the risks of transmission of blood-borne infections to the patient.
6) We considered necessary to include the followings:
7) Demonstrates knowledge and follows the guidelines on preoperatory preparation of patients with anemia, hemorrhage risk and other hematologic diseases.
8) Competently performs and teaches undergraduates on the use of pharmacological and non pharmacological alternatives to blood components, in order to avoid the risks of allogenic blood transfusion.
9) Knows how to save blood components useful for hemoderivatives' production.

The specialty-training program includes developing competencies related to transfusion medicine in the fourth year. The skills include anesthetic techniques: evaluation and substitution of fluids lost during surgical procedures with blood components, colloids and crystalloids; indication and control of anticoagulation therapy of patients with cardiovascular disease undergoing non-cardiac surgery; and one referred to blood components transfusion in pediatric patients.

Ten interviewed professors of the specialty coincide in offering an additional preparation in transfusion medicine to the residents. They recognize as beneficial an initial training to reinforce the fundamental concepts and the basic principles for a safe transfusion practice.

DISCUSSION

The transfusion medicine competency demands capacity to mobilize knowledge, abilities, attitudes and values in a simultaneous, interrelated and pertinent way, to transfuse less and better, with more safety and smaller costs.

Reasons for a competent transfusion medicine performance of anesthesiologists:[6-8]

1. They are the most important participants of perioperative transfusion and control in order to minimize the use of blood components transfusions.
2. The correct transfusion practice demands knowledge of perioperative hemostasis and familiarization with evaluation systems of primary hemostasis, coagulation tests and their bedside availability.
3. Understanding hemostasis alterations and transfusion practice has become an important subject area of anesthesiology in XXI century.
4. Good handling of anticoagulation and perioperative transfusion medicine are professional competencies that influence in results of intraoperative monitoring.
5. A wide variation in clinical practice still exists, without uniform approaches, because the decision of transfusing depends on the preferences of the physician or the institution instead of the clinical condition of the patient. Therefore, anesthesiologists need to unify criteria on this issue.

Development of transfusion medicine competency should be integrated to the strategy of WHO to increase the safety of the blood and blood components. The resolution WHA63.12: "Availability, safety and quality of blood products", requests the Director-General of WHO "to provide guidance, training and support to Member States on safe and rational use of blood products … and patient blood management".

Patient blood management is a patient-focused, evidence-based and systematic approach to optimize the management of patient and transfusion of blood products for quality and effective patient care.[8]

Essential elements of patient blood management include: the prevention of conditions that might otherwise result in the need for transfusion (through health promotion and screening for early detection), appropriate diagnosis and optimal treatment, including the use of alternatives to transfusion, good surgical and anaesthetic techniques, the use of alternatives to blood transfusion and blood conservation.[8]

A strategy should be implemented combining several actions, including international educational experience, and identification of transfusion medicine learning necessities, weaknesses to eliminate or specific problems to solve, in order to guarantee safe and rational use of blood components. Its implementation should have organizational support of hospital unit's managers, with the consent of health authorities and cooperation of scientific societies to develop the good clinical practice guidelines and the advice to health authorities.[8]

The transfusion medicine competency education implies:

- To deepen knowledge on the fundaments of appropriate blood use, transfusion potential risks and appropriate use, that allow correct prescription, as well as safe and rational prescription of blood components.[2,5]
- To update knowledge of risks and indications of blood components transfusions which avoid variability between different institutions and professionals who prescribe blood components.[2,9]
- To deepen on issues of circulatory and respiratory physiology with a direct effect in clinical use of blood components.
- Safe prescription of blood components requires to understand the effects of anemia and the corresponding compensatory mechanisms which, when reinforced, can be the reason to postpone the use of blood components or to avoid an inappropriate blood transfusion.[4,5]
- To persist systematically in the identification of improvements that can be made in the procedures of request, gathering, storage, transport and administration of blood components, as well as in the monitoring of the transfused patient.[1,9]
- To continually deepen knowledge on adverse reactions or complications produced as a consequence of allogenic blood transfusion, as well as to understand the procedure to continue their investigation and report.[5,9]
- Ethical principles applied to transfusion practice represent a challenge from ethical, legal, technical and scientific points of view, because these professionals have the duty and the responsibility to exchange criteria with their patients and to understand why the procedure is accepted by some religious groups, but not by others.[5,10]
-

- Knowing transmission risks of blood-borne infections means to develop and to continue and periodically update good practices guidelines for the safe use of blood in anemic patients, hemorrhagic risk or other hematologic diseases.[8,9]
- To employ alternatives to blood components to reduce transfusion requirements and to preserve the patient's safety. Most of alternatives to use blood components are safe, of very low cost and very efficient, if the professionals are properly trained in the principles of their administration and their advantages.[6,9]

In some countries clinical, economic and logistic disadvantages of blood transfusion have promoted recommendations for the restrictive use of blood components, particularly to avoid the unnecessary transfusion. Strategies of patients' integral treatment exist with the purpose of avoiding or reducing the use of blood and to improve the clinical outcomes.[1,9]

CONCLUSIONS

Transfusion medicine competency includes knowledge and abilities demonstration about risks of transmission of blood-borne infections, the safe prescription of blood components, the identification of transfusion reactions, teaching and training of undergraduates in the procedures of intravenous infusion of blood and blood components or the use of alternatives; knowledge and regular updating on ethical, scientific and legal aspects to support appropriately the professional performance and to recognize the importance of taking into account the decision of the patients.

REFERENCES

1. Corwin HL, Theus JW, Cargile CS, Lang NP. Red blood cell transfusion: Impact of an education program and a clinical guideline on transfusion practice. J Hosp Med. 2014;9(12):745-749.

2. Freitas Flausino G de, Ferreira Nunes F, Mourão Cioffi JG, Freitas Carneiro Proietti AB de. Teaching transfusion medicine: current situation and proposals for proper medical training. Rev Bras Hematol Hemoter [Internet]. 2015 Jan-Feb [cited 2017 Nov 11];37(1):[about 8p.]. Available from: http://www.sciencedirect.com/science/article/pii/S1516848414001418

3. Javadzadeh Shahshahani H. Status of Transfusion Medicine Education in Iran. Arch Iran Med.2016;19(6):439-445.

4. Karafin MS, Bryant BJ. Transfusion medicine education: an integral foundation of effective blood management. Transfusion. 2014;54:1208-1211.

5. Graham J, Grant-Casey J, Alston R, Baker P, Pendry K. Assessing transfusion competency in junior doctors: a retrospective cohort study. Transfusion.2014;54:28-136.

6. Bisbe Vives E, Basora Macaya M. Optimización del paciente quirúrgico con riesgo de transfusión. «Patient Blood Management»: el nuevo paradigma de la medicina perioperatoria. Rev Esp Anestesiol Reanim. 2015;62(Supl1):1-2.

7. Gomar C. Competencias que actualmente se le exigen al anestesiólogo en anestesia cardiovascular. Rev Esp Anestesiol Reanim. 2013;60(4):183-186.

8. Canillas F, Gómez Ramírez S, García Erce JA, Pavía Molina J, Gómez Luque A, Muñoz M. "Patient Blood management" en cirugía ortopédica. Rev Esp Cir Ortop Traumatol. 2015;59(3):135-149.

9. Contreras M, Martínez MC. Medicina transfusional en el siglo XXI. Rev Med Clin Condes. 2015;26(6):726-743.

10. Luna González AJ. Evolución del método de transfusión sanguínea y alternativas terapéuticas. MEDISAN [Internet]. Oct 2010[citado 2 Mar 2018];14(7): [aprox. 11p.]. Disponible en: http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S1029-30192010000700013&lng=es