Disponible en ligne sur
ScienceDirect
www.sciencedirect.com

Elsevier Masson France
EM|consulte
www.em-consulte.com

TRANSFUSION
CLINIQUE ET BIOLOGIQUE

Transfusion Clinique et Biologique 24 (2017) 47–51

Original article

Evaluation of the non-compliance with grouping guidelines which may lead to "wrong blood in tube", an observational study and risk factor analysis

Mauvaises pratiques lors des prélèvements pouvant conduire à des erreurs de groupage, étude observationnelle et analyse des facteurs de risque

A. Daurat [a,*], E. Boudet [a], G. Daurat [b], C. Roger [a], J.-C. Gris [c], V. Tunez [d], M.-C. Gaste [e], J.-Y. Lefrant [a]

[a] *Division anesthésie réanimation douleur urgences, CHU de Nîmes, place du Pr Robert-Debré, 30029 Nîmes cedex 9, France*
[b] *Hospital hemovigilance officer, délégation qualité gestion des risques, CHU de Nîmes, place du Pr Robert-Debré, 30029 Nîmes cedex 9, France*
[c] *Laboratory of Hematology, CHU de Nîmes, place du Pr Robert-Debré, 30029 Nîmes cedex 9, France*
[d] *Établissement français du Sang Pyrénées-Méditerranée, site de Nîmes, place du Pr Robert-Debré, 30029 Nîmes cedex 9, France*
[e] *Direction of care, CHU de Nîmes, place du Pr Robert-Debré, 30029 Nîmes cedex 9, France*

Abstract

Background. – In France, blood group determination requires the completion of two samples collected at two different times to detect identity mistake and "wrong blood in tube". The aims of the present study were: (1) to evaluate the compliance with guidelines and (2) to identify risk factors of non-compliance.
Materials and methods. – Samples for ABO group determination collected between January 1st and December 15th, 2013 in the University hospital of Nîmes, France were analyzed. An ABO group determination demand was considered non-compliant if more than one tube arrived in the laboratory within ten minutes apart. Between May 1st and June 30th 2014, a self-administered questionnaire was offered to the nurses of the hospital on a random day for each service during this period. The aim was to validate the non-compliance criterion and the identification of risk factors using logistic regression.
Results. – Among the 16,450 analyzed blood samples, the overall compliance rate was 65.1%. Lower compliance rates were found in the surgical services. Independent risk factors for wrong practice were work overload, surgical service and individual intermediate transfusion frequency.
Discussion. – More than one third of ABO group determinations did not follow national recommendations, which induces a substantial risk of "wrong blood in tube" and group error. The study revealed major variations among hospital services. Identification of risk factors allows targeted corrective actions.

Keywords: Red blood cell transfusion; Group determination; Guidelines compliance

Résumé

Contexte. – En France, la détermination du groupe sanguin nécessite le prélèvement de deux échantillons de sang à deux moments différents pour minimiser le risque d'erreurs d'identité qui peuvent conduire à des erreurs dans la détermination de groupe de type « wrong blood in tube ». Les objectifs de cette étude étaient : (1) d'évaluer la compliance avec cette recommandation ; (2) de tenter d'identifier les facteurs de risque de non compliance.
Matériel et méthodes. – Les échantillons pour détermination du groupe sanguin collectés entre le premier janvier et le 15 décembre 2013 au CHU de Nîmes ont été analysés. Une demande de groupage était considérée comme non conforme, si les deux tubes arrivaient ensemble au laboratoire. Entre le premier mai et le 30 juin 2014, un auto-questionnaire était distribué aux infirmières des différents services pour identifier les facteurs de risque de non compliance aux recommandations. Une régression logistique était réalisée pour identifier les facteurs indépendants.

* Corresponding author. Réanimation chirurgicale, CHU de Nîmes, place du Pr Robert-Debré, 30029 Nîmes cedex, France.
E-mail address: aurelien.daurat@chu-nimes.fr (A. Daurat).

http://dx.doi.org/10.1016/j.tracli.2017.01.003
1246-7820/

Résultats. – Sur les 16 450 tubes arrivés au laboratoire, la compliance globale était à 65,1 %. Les services chirurgicaux étaient ceux où la compliance avec les recommandation était la plus faible. Les facteurs de risque identifiés chez les infirmières étaient : la surcharge de travail, la pratique en milieu chirurgical et une pratique de la transfusion sanguine moyennement fréquente.
Discussion. – Plus d'un tiers des demandes de groupage étaient non conformes. Il existe donc un risque important d'erreur de groupe. Il existait une importante disparité entre les services. L'identification de facteurs de risque permet de mieux cibler les mesures correctives.

Mots clés : Transfusion de globules rouge ; Détermination de groupe ; Adhérence aux recommandations

1. Introduction

Packed red blood cell (PRBC) transfusion remains currently one of the most widely used treatment around the world. In 2012, 2,515,888 PRBC were transfused in France [1]. As infectious complications dramatically decreased in the last two decades, immunological risks is now on the foreground. Especially, ABO-incompatible blood transfusion leading to acute hemolytic reactions remains one of the leading causes of transfusion related death [2]. Its main cause is "wrong blood in tube" (WBIT) errors, in which the blood sample is not that of the patient identified on the label [3]. In France, according to the Minister's circular of December 15th 2003, two blood samples have to be collected at two different times, by two different nurses if possible, for the determination of the ABO group in order to limit the risk of WBIT [4].

In the University hospital of Nîmes, France, we have been alerted by several episodes of ABO discrepancies between the two blood samples and previous patient's data. These near-miss events led to an inquiry, which revealed that the two blood samples had been collected simultaneously.

The aims of the present study were:

- to assess the compliance with sampling rules by ward and overall in the hospital;
- to identify risk factors of non-compliance with guidelines in order to provide remedial actions.

2. Materials and methods

The Institutional Review Board of the Nîmes University Hospital, France, approved the present study protocol (IRB n° 140603).

The present study was composed of two sub-studies. The first one was a report of the demand of ABO group determination between January 1st 2013 to the December 15th 2013 (compliance rate assessment study). The second one aimed at analyzing the risk factor of non-compliant demand and was performed between May 2nd and June 20th 2014 (non-compliance risk factors analysis).

2.1. Compliance rate assessment study

All medical, surgical and obstetrical wards of the university hospital of Nîmes, France were included in the present study. To avoid identification errors, hospital protocol specified that the two mandatory determinations of ABO group should be collected by two different nurses on two different shifts. This rule is meant to ensure that the two samples are from two different venipuncture. Blood samples were brought to the laboratory hourly during daytime, and least every three hours at night.

2.2. Data collection

All blood group testing recorded in the laboratory (*Établissement français du sang* [EFS]) from January 1st 2013 to December 15th 2013 were extracted from the Hospital Information System (CURSUS software). The software allowed a count of ABO group determinations by medical ward and patient identification number without the need to access the patient record. The software also provided the precise time of arrival of each blood sample in the laboratory.

2.3. Compliance rate definition

An ABO group determination demand was considered non-compliant if more than one tube for the same patient in the same ward was recorded within ten minutes apart in the laboratory. A demand could thus include one, two or more tubes. The main outcome was the compliance rate defined as follows: ratio of the number of compliant demands on the total number of demands.

2.4. Validation study and non-compliance risk factors analysis

Between May 2nd and June 20th 2014, a self-administered questionnaire was provided to the nurses of all maternity, surgical, medical, ICU services of the hospital. Nurses of the emergency room and of the neonatal unit were not given a questionnaire, because specific audits had recently been performed in these units. The questionnaire was proposed to nurses of each ward at the mid-day in order to describe their practice of blood group determination sampling. On the randomly chosen day, they were asked to individually fulfil the questionnaire which was immediately collected.

The questionnaire was anonymous, short and concise (Appendix A). One of the questions was crucial: "If you have to send together two group determinations of a patient to the laboratory, are the two tubes from the same venipuncture?" Any answer different than "never" was considered incorrect. An incorrect rate to the crucial question superior to 50% was fixed arbitrarily to validate the non-compliance criterion.