Trends in Red Blood Cells Transfusions within the Biologics Effectiveness and Safety (BEST) Initiative Network, 2012-2018

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INTRODUCTION

The U.S. FDA Center for Biologics Evaluation and Research (CBER) recently established the Biologics Effectiveness and Safety (BEST) Initiative – an active surveillance system for all CBER-regulated products including blood components, which allows assessment of utilization patterns. The 2015 National Blood Collection & Utilization Survey (NBCUS) Report found an overall decrease in the number of units of red blood cells (RBCs) transfused in recent years.

OBJECTIVE

The aim of this study is to describe the utilization of RBCs from January 1, 2012 through December 31, 2018 using electronic health records (EHR) from three data sources participating in the BEST Initiative.

METHODS

We queried approximately 15 million patient records from three EHR data sources participating in the BEST Initiative (Columbia University, University of Colorado, and Regenstrief Institute). As shown in Figure 1, using ISBT 128 codes, for each data source we determined:

- **Transfused patients**: the number of unique patients with at least one unit of RBCs transfused per year;
- **Transfusion episodes**: the number of patients having 1; 2-5; 6-11; or > 12 episodes containing at least one unit of RBCs per year;
- **RBC Units per transfusion episode**: the number of transfusion episodes having 1, 2-4, or 5 transfused RBC units/transfusion episode;
- **Total units of transfused RBC per year**: the total numbers of RBC units transfused per year from each EHR data source during 2012-2018.

With the use of ISBT 128 codes, we also classified RBC units by collection (whole blood-derived and apheresis) and modification (leukocyte-reduction[LR] and irradiation[Irr]) methods.

CONCLUSION

We demonstrated that within the BEST Initiative data sources, RBC transfusions can be identified using ISBT 128 coding system at patient, transfusion episode, and unit levels. Using these tools, we found that the numbers of RBC transfusions per year, particularly in relation to the number of patients receiving any RBC transfusion, appeared relatively stable. The RBC transfusion trends in this small network-based cohort contrast with that described by the NBCUS, and they may or may not reflect aggregate national trends which needs to be further investigated. However, access to ISBT 128 codes within EHR data sources provides the ability to capture large number of transfusions, and future queries provide even more granular capture of blood transfusion details and identification of blood utilization patterns.

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