Letter to the Editor

Establishment of a case registry that collaborates with a reference laboratory for blood group immunogenetics in Korea

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Dear Sir,

The Korean Rare Blood Program (KRBP), established in 2013, is divided into two registries: a transfusion registry (the KRBP database) and a case registry (the KRBP case archive). The transfusion registry is a database of red cell antibodies voluntarily registered by blood banks in Korea. A recent study on the transfusion registry of the KRBP provided data on the frequencies of blood group antigens and the distributions of red cell antibodies[1]. The case registry is an archive of challenging cases associated with blood group immunogenetics, and it collaborates with the KRBP reference laboratory. Cases that require specialized immunohematological methods or molecular analysis, such as cases with ABO subgroups, RhD variants, and complex red cell antibodies, are registered and resolved through further analysis. In addition to the recent study[1], our letter described a case registry that was offered as a resource to address and possibly resolve the challenging cases.

Cases that could not be resolved by blood banks in Korea using routine methods were submitted to the case registry. The request forms, which include the reason for the request, patient's medical history, laboratory findings, and informed consent form, were submitted online (http://bloodgroupimmunogenetics.org). Then the blood samples were sent to the KRBP reference laboratory for further analysis. The specialized tests available through the KRBP reference laboratory included *ABO*/*RHD*/*RHCE* genotyping, antibody identification, specialized immunohematological tests including dithiothreitol treatment, and human erythrocyte/leukocyte/platelet antigen (HEA/HLA/HPA) genotyping. The comprehensive results were reported on a webpage accessible only to the blood banks from which the request had been made. Cases registered from July 2013 to June 2022 were analyzed.

Excluding 44 cases with clerical errors, 801 cases were registered from 66 hospitals (mean bed number: 963.3 ± 468.1), including cases related to the ABO system, Rh system, red cell antibody, and others (225, 183, 317, and 76 cases, respectively) (**Table I**). CisAB cases accounted for more than half of the cases with molecularly confirmed ABO subgroups, reflecting relatively high proportion in East Asian countries[2]. Twenty-one cases of Asian type DEL were identified. Although doctors in Korea recognize that Asian type DEL individuals are not at risk of alloimmunization after exposure to D+ blood components, D- blood components are in principle selected for transfusion. The previous suggestion that Asian type DEL individuals can be safely transfused with D+ blood components was proven in a recent clinical trial[3], although there is an exceptional single case where allo-anti-D was formed[4].

To resolve complex red cell antibody cases, reagent red cell panels from various

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Table I - *Results of cases registered in the case registry*

ABO (No.=225)	Cases	RhD (No.=183)	Cases	Red cell antibodies (No.=317)	Cases
Normal ABO group	90	**D+**	15	**Major alloantibodies[a]**	91
ABO subgroup		**D-**		**Minor alloantibodies[a]**	12
CisAB	62	*RHD complete deletion*	31	**Cold antibodies**	27
A subgroup	7	*RHD-CE-D hybrid*	10	**Autoantibodies**	32
B subgroup	40	**D variant**		**Alloantibodies to HFA**	78
ABO discrepancy		Partial D	26	**Alloantibodies to LFA**	5
Red cell antibody	13	Weak D	9	**Interference**	7
Decreased Ig	9	DEL	21	**Negative**	22
Paraprotein	4	Unspecified	62	**Etc.[c]**	43
		D--/D--	1		
		Etc.[b]	8		

[a]Major alloantibodies were defined as alloantibodies to antigens that must be expressed in reagent red cell sets licensed by United States Food and Drug Administration (D, C, E, c, e, M, N, S, s, P1, Le[a], Le[b], K, k, Fy[a], Fy[b], Jk[a], and Jk[b]). Minor alloantibodies were defined as alloantibodies other than major alloantibodies. [b]Cases in which comprehensive serologic typing was not performed. [c]Cases that remained inconclusive even after antibody identification based on the tube method and column agglutination using more than 30 reagent cells. Ig: immunoglobulin; HFA: high frequency antigen; LFA: low frequency antigen.

manufacturers based on column agglutination technique and tube method were used. HEA genotyping and special immunohematological techniques were also used, such as adsorption and elution, reaction with cord blood, and dithiothreitol treatment.

The case registry could be improved through the following suggestions. Currently, we did not track how the report results affected transfusion-related decisions. The effect of operating the case registry can be enhanced through collecting data on transfusion outcomes. For unresolved cases, collaboration with immunohematology reference laboratories in other countries should be considered.

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ETHICAL CONSIDERATION

This study was approved by the institutional review board of Seoul National University Bundang Hospital in 2017 and is being extended on an annual basis (approval number: B-1705-396-109).

Written informed consent was obtained from each participant for study participation and data publication.

The research was conducted ethically, with all study procedures being performed in accordance with the requirements of the World Medical Association Declaration of Helsinki.

AUTHORS' CONTRIBUTIONS

DWS and YJH wrote the first draft of the manuscript. DWS curated and visualized the data. YJH contributed to the methodology and investigation. KUP acquired the funding, conceptualized the study, and critically edited the manuscript. All Authors were involved in preparing the final manuscript and approved the submitted version.

The Authors declare no conflicts of interest.

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