Transfusion News from Asia

The second issue, 2025

CONTENTS

Editorial

We are pleased to present the second issue of Transfusion News from Asia, featuring three articles on advancing transfusion safety and technology.

Hsin-Chung Lin's article on the Taiwan Hemovigilance Network highlights its role in enhancing transfusion safety by tracking adverse reactions. It demonstrates a reduction in febrile non-hemolytic transfusion reactions (FNHTR) after the introduction of pre-storage leukoreduced blood products. Hidefumi Kato's piece on Japan's hemovigilance systems details how two complementary systems, from the JRCS and JSTMCT, work together to improve safety, and notes that the use of washed platelet concentrates has reduced allergic reactions. Finally, Siqiang Gao's report on LMCE 2024 highlights the increasing need for automation and digital transformation in transfusion medicine to meet new demands with limited staff resources.

These contributions collectively showcase the region's commitment to safer transfusion practices through continuous surveillance, product innovation, and technological advancement.

Kazuhiro Nagai, Task Force for TNFA, JSTMCT

Taiwan Hemovigilance Network: Enhancing Transfusion Safety through Comprehensive Surveillance (2018–2023)

Hsin-Chung Lin
[1]Director, Division of Clinical Pathology, Department of Pathology, Tri-Service General Hospital, National Defense Medical Center,Taipei, Taiwan.
[2]Associate Professor, Graduate Institute of Pathology and Parasitology, National Defense Medical Center, Taipei, Taiwan
[3]Director, Taiwan Society of Blood Transfusion

The Taiwan Hemovigilance Network (THN) was established in October 2014 through a collaborative agreement between the Taiwan Society of Blood Transfusion (TSBT) and the Taiwan Blood Services Foundation (TBSF). Designed to systematically track, report, and analyze adverse transfusion reactions (ATRs), THN ensures blood transfusion safety through standardized definitions and comprehensive reporting mechanisms. Standardized definitions and reporting forms were introduced in May 2015, followed by the launch of a user-friendly web-based reporting platform in January 2017. Initially comprising five hospitals, network participation grew significantly, reaching 80 institutions by 2023. Correspondingly, the coverage rate of the Taiwan Hemovigilance Network increased substantially, from an initial 24% to approximately 60%, despite a temporary decrease to 45% in 2022 due to the impacts of COVID-19. Annual reports of transfusion reactions have notably increased from 1,569 cases in 2018 to 2,308 cases in 2023.

Between 2018 and 2023, the Taiwan Hemovigilance Network recorded a total of 16,204 transfusion reaction cases

(Table 1). The most frequently reported reaction was febrile non-hemolytic transfusion reaction (FNHTR), with 7,360 cases across six years, peaking at 1,634 cases in 2019.

	2018	2019	2020	2021	2022	2023	Total
Febrile non-hemolytic transfusion reaction	1,546	1,634	1,244	912	993	1,031	7,360
Allergic reactions	1,105	1,259	1,152	1,189	1,191	1,249	7,145
Transfusion-associated dyspnea	118	97	107	86	87	96	591
Delayed serologic transfusion reactions	28	17	20	20	23	20	128
Hypotensive transfusion reaction	18	16	14	20	32	20	120
Ttransfusion-associated circulatory overload	32	49	55	49	48	48	281
Delayed hemolytic transfusion reactions	0	7	5	6	4	1	23
Acute hemolytic transfusion reactions	0	0	0	0	2	2	4
Transfusion-associated graft-versus-host disease	0	0	1	0	1	0	2
Transfusion-related acute lung injury	2	2	2	4	6	4	20
Posttransfusion Purpura	1	0	0	0	0	0	1
Other	53	27	21	30	49	53	233
Unable to determine	35	45	37	32	91	56	296
Total	2,938	3,153	2,658	2,348	2,527	2,580	16,204

Table 1. Annual distribution of transfusion reactions reported by the Taiwan Hemovigilance Network (2018-2023)

Significantly, after the nationwide implementation of pre-storage leukoreduced packed red blood cells in August 2021, the incidence of FNHTR markedly declined. Allergic reactions were the second most common, totaling 7,145 cases, reaching a peak of 1,259 cases in 2019. Transfusion-associated dyspnea accounted for 591 cases, maintaining relatively stable annual rates. Additional reactions included transfusion-associated circulatory overload (281 cases), delayed serologic transfusion reactions (128 cases), and hypotensive transfusion reactions (120 cases). Rare but clinically important reactions included delayed hemolytic transfusion reactions (23 cases), acute hemolytic transfusion reactions (4 cases), transfusion-related acute lung injury (TRALI, 20 cases), and transfusion-associated graft-versus-host disease (TA-GvHD, 2 cases). Additionally, 233 cases were categorized as "other" reactions, with 296 cases remaining undetermined. This data reflects

robust surveillance efforts, highlighting critical areas for continued enhancement of transfusion safety.

The 2023 data further indicated clear age-related patterns in transfusion reactions (Table 2). FNHTR cases predominantly occurred among individuals aged 60-69 (248 cases), closely followed by the 70-79 age group (203 cases). Similarly, allergic

	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80上	Total
Febrile non-hemolytic transfusion reactions	33	31	44	49	110	173	248	203	140	1,031
Allergic reactions	62	64	77	145	162	216	235	182	106	1,249
Transfusion-associated dyspnea	1	4	3	10	9	15	17	20	17	96
Delayed serologic transfusion reactions	0	0	0	2	2	3	9	3	1	20
Hypotensive transfusion reactions	0	0	1	0	3	4	5	4	3	20
Transfusion-associated circulatory overload	2	0	0	2	5	5	15	8	11	48
Delayed hemolytic transfusion reactions	0	0	0	0	0	0	1	0	0	1
Acute hemolytic transfusion reactions	1	0	0	0	0	0	1	0	0	2
Transfusion-related acute lung injury	0	0	0	0	0	0	2	1	1	4
Others	1	1	4	2	2	9	18	8	8	53
Unable to determine	0	0	3	1	10	8	13	13	8	56

Table 2. Age Distribution of Transfusion Reactions Reported in Taiwan, 2023

reactions peaked within the 60-69 age group (235 cases), with notable numbers in the 50-59 (216 cases) and 70-79 (182 cases) age groups. Transfusion-associated dyspnea showed slightly higher occurrences in older populations, particularly in those aged 70-79. Other less frequent reactions, including delayed serologic reactions, hypotensive reactions, and circulatory overload, mainly reported in patients over 60. Acute and

delayed hemolytic transfusion reactions were rare but predominantly observed in older adults, emphasizing the necessity for vigilant monitoring and tailored transfusion strategies for elderly patients.

Despite Taiwan's globally high blood donation rates, periodic blood shortages and increasing demands for red blood cells per hospital admission remain significant challenges. Thus, ongoing education and optimized patient blood management strategies are critical. Future directions aim for universal hospital participation, enhanced healthcare provider education in patient blood management, and continuous improvement of blood supply chain logistics and transfusion practices. These strategic initiatives are vital to further reduce adverse transfusion reactions and sustain high-quality patient care.

In conclusion, Taiwan’s hemovigilance system demonstrates significant strides toward improved transfusion safety. Through meticulous reporting, consistent monitoring, and targeted interventions, the THN continues its commitment to advancing safer transfusion practices and achieving superior patient outcomes nationwide.

Hemovigilance in Japan

Hidefumi Kato MD., PhD.
Fukuyu Hospital / Aichi Medical University

Hemovigilance was started on Japanese Red Cross Society (JRCS) in 1993 in Japan. However, with this system, it is difficult to grasp accurate trends in transfusion adverse reactions, because this system tends to report only severe cases. In order to compensate for this deficiency, hemovigilance on the Japan Society of Transfusion Medicine and Cell Therapy (JSTMCT) was started in 2007. Currently, there are 2 hemovigilance systems in Japan (Fig. 1). Also, to accurately assess the incidence of adverse reactions, a standard of sings and symptoms is needed. Therefore, a standard adverse reaction form was used the 17 items (Table 1). The definitions of all signs and symptoms are based on documents issued by the

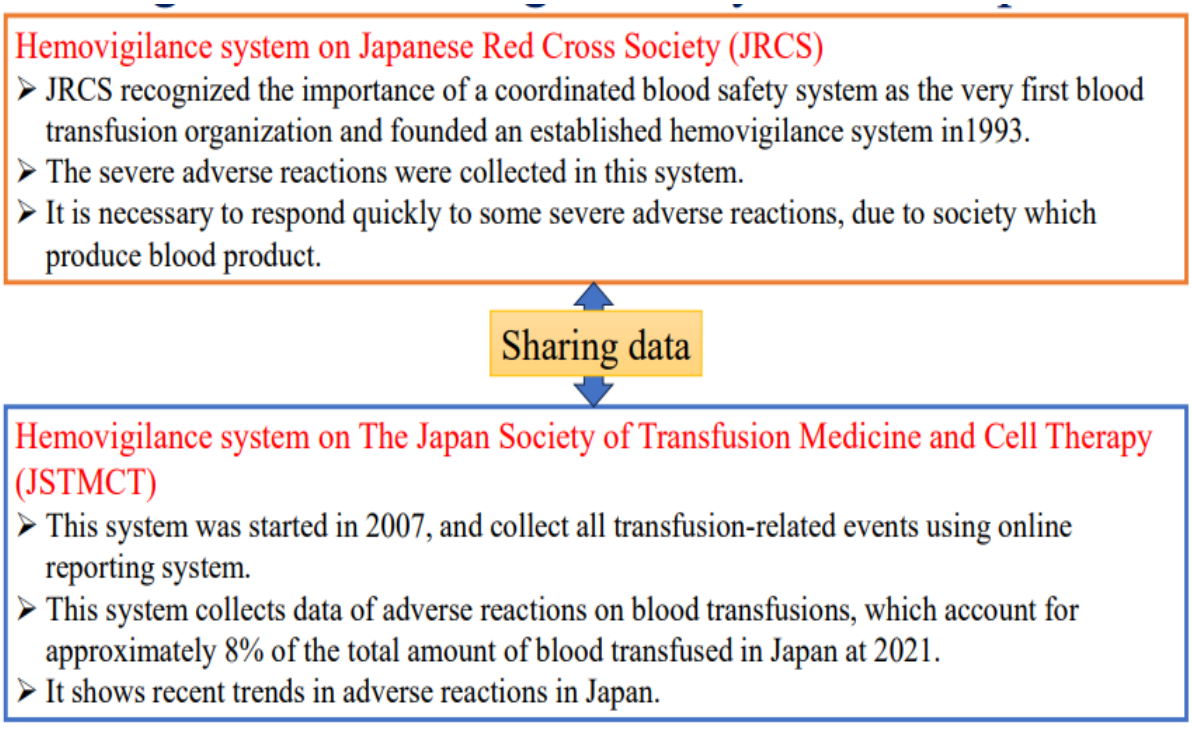


Figure 1. Hemovigilance system in Japan

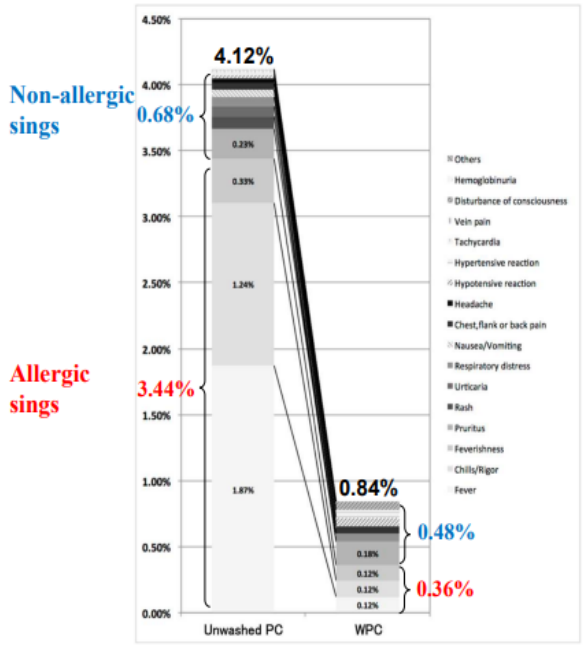
International Society of Blood Transfusion (ISBT) Working Party for Haemovigilance1).

1) Fever (more than 38° C, more than 1° C increase after a transfusion)	10) Headache
2) Chills/rigor	***11) Hypotension*** (a decrease of more than 30 mmHg after a transfusion)
3) Feverrishness	12) Hypertension (a increase of more than 30 mmHg after a transfusion)
4) Pruritus	
5) Skin rash	13) Tachycardia
6) Urticaria	14) Vein pain
7) Respiratory distress	***15) Disturbance of consciousness***
8) Nausea/vomiting	***16) Hemoglobinuria***
9) Chest/flank/back pain	17) Others

The occurrence times of adverse reactions after a transfusion (min.)
The bold and italic items of signs and symptoms are possible serious adverse reactions.

Table 1. Signs and symptoms of adversed reactions in Japan

It has been revealed that the incidence of transfusion adverse reactions is approximately 1% per unit (RBC 0.6%, PC 2%, and FFP 1%) in Japan. On the other hand, the incidence of adverse reactions has been reported as between 0.08% and 0.42%2). It is highly likely that our results reveal the true incidence of adverse reactions (serious and nonserious) for blood components distributed in Japan. Furthermore, while the majority of adverse reactions to RBC were both febrile nonhemolytic transfusion reactions and allergic reactions, most adverse reactions to FFP and PC were allergic reactions. In addition, after the start of washed PC (WPC) release by the JRCS, the number of transfused WPCs doubled. The rate of adverse reactions to PCs decreased significantly, from 4.30% before the release to 4.05% after the release. The rates of adverse reactions to unwashed and WPCs were 4.13% and 0.84% (Fig. 2). The release of WPCs by the JRCS significantly reduced transfusion-related adverse reactions to PCs in



	Unwashed PC	Washed PC
Skin rash	0.33%	0.12%
Pruritus	1.24%	0.12%
Urticaria	1.87%	0.12%

Figure 2. Incidence of allergic reations between unwashed PC and washed PC

Japan3). Therefore, hemovigilance not only helps us understand the status of transfusion adverse events, but also allows us to verify the usefulness of new blood products. However, because this system uses trend analysis, it has limitation in clarifying detailed blood transfusion risks.

To solve this problem, we built a system that can collect all data of transfused episodes with blood products and transfusion patients; a traceability. This system links blood product data and transfused patient data using the lot number of blood product, and keeps track of the entire process from blood donation to post-transfusion (Fig. 3). The data of blood products are the data of blood donors, the product manufacturing process, and etc. The data of patients are gender, age, transfusion adverse reactions, and etc. We believe that this system will become the basis for promoting digitalization of transfusion networks with various medical institutions.

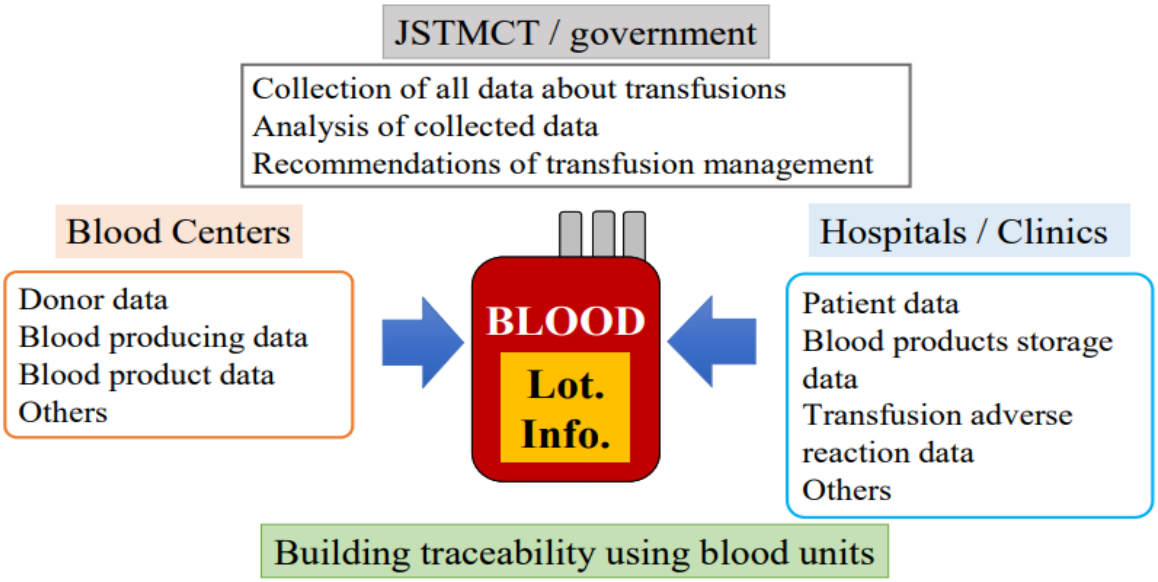


Figure 3. Experimental course in different blood banks

References

1. ISBT Working Party on Haemovigilance. Proposed standard definitions for surveillance of non-infectious adverse transfusion reactions. Amsterdam: International Haemovigilance Network, International Society of Blood Transfusion; 2011 Jul [cited 2013 Nov 9]. Available from: http://www.isbtweb.org/fileadmin/user_upload/files-2015/haemovigilance/definitions/Proposed%20definitions%202011%20surveillance%20non%20infectious%20adverse%20reactions%20haemovigilance%20incl%20TRALI%20correction%202013.pdf

2. Siegenthaler MA, Schneider P, Vu DH, et al. Haemovigilance in a general university hospital: need for a more comprehensive classification and a codification of transfusion-related events. Vox Sang. 2005; 88: 22-30.

3. Ikebe E, Matsuoka S, Tnak A, et al. Reduction in adverse transfusion reactions with increased use of washed platelet concentrates in Japan – A retrospective multicenter study. Transfus Apher Sci 2019; 58: 162-168.

Conference Report: Laboratory Medicine Congress & Exhibition (LMCE) 2024, Gangnam, South Korea

Siqiang Gao

Department of Transfusion Medicine, Aichi Medical University Hospital, Nagakute, Japan

The Laboratory Medicine Congress & Exhibition (LMCE) 2024 was held from September 25 to 27, 2024, at the COEX Convention Center in Gangnam (Fig. 1), one of the most advanced business districts in South Korea, offering various experiences, from business to culinary to educational. The most magnificent facility in Gangnam is the Starfield Library, which housing approximately 50,000 books, where people can indulge in reading and studying.

LMCE has maintained close relationships with various international organizations such as the Association for Diagnostics & Laboratory Medicine, the Clinical & Laboratory Standards Institute, the College of American Pathologists, and the International Council for Standardization in Hematology, making LMCE a valuable and significant international conference. Thus, nearly 100 companies exhibited their automated machinery, and approximately 300 presentations, including symposiums and posters, were delivered, about one-third of which were from outside Korea. The LMCE renews its organizing committee every three years, and the current committee adopted the main theme: Digital Transformation of Laboratory Medicine for the 2022-2024 period.

Figure 1. Opening ceremony of LMCE 2024

The international academic collaboration between the Japanese Society of Blood Transfusion and Cell Therapy (JSTMCT) and the Korean Society of Laboratory Medicine (KSLM) enabled me to attend LMCE and make a presentation in the symposium entitled "Automation in Blood Bank Testing." I would like to express my sincere gratitude to Dr. K. Nagai (Nagasaki Medical Center, Nagasaki, Japan), Dr. S. Miyata (Central Blood Institute, Japanese Red Cross Society, Tokyo, Japan) and Dr. T. Matsushita (Nagoya University School of Medicine, Nagoya, Japan) for providing me with this opportunity. As a biomedical laboratory scientist (BLS) in the department of blood transfusion medicine, first of all, I explained that the requirements for transfusion departments in Japan were increasing due to compliance with ISO 15189, new modalities such as CAR-T, and the need to improve patient services and safety, as well as to meet the demand for emergency transfusions. However, we have to cope with these demands with a limited number of lab members, as Japan's population is decreasing and task shifting and sharing with

physicians have led to a reduction in available staff.

Thus, automation in blood testing is inevitable and I described what we focused on when selecting a Full-Auto CAT. Even if Full-Auto CAT is not affordable, I recommended a Semi-Auto-CAT over a manual CAT for safety reasons. Through a discussion with a participant, I afterwards noticed that Semi-Auto-CAT was useful when Full-Auto CAT was out of order. I also showed that Japanese BLS have recently started to explain rare blood types or clinically significant antibodies and provide a hand-held information card to such patients, helping them go to another hospital. Most participants seemed to have great interest in our patient service as I received several questions about transfusion information cards from audience. The involvement of the transfusion management system (TMS) is indispensable for producing such leaflet outputs. To ensure safe and prompt transfusion and cell therapy, not only automated testing equipment but also the TMS is equally essential. In recent years, the rise of novel cell therapies has expanded the scope that TMS must cover. It is imperative to reaffirm the importance of a rigid and flexible TMS.

One of the highlights of the conference was a plenary lecture titled "Opportunities and Limitations of Big Data in Laboratory Medicine." The speaker emphasized that while big data contributes significantly to improving diagnostic accuracy, advancing personalized medicine, and facilitating research, challenges remain in terms of data quality, standardization, privacy protection, and ethical considerations. This discussion aligned seamlessly with the common keyword of "Digital Transformation," underscoring the evolving role of technology in laboratory medicine.

Several symposiums offered cutting-edge topics. In the joint

symposium between the International Committee for Standardization of Hematology (ICSH) and KSLM, the history of ICSH and challenges in guideline formulation were addressed. Other discussions centered on clinical microbiology testing using next-generation sequencing (NGS), the integration of artificial intelligence (AI) with clinical laboratory testing, and the ClinGen guidelines, which aim to standardize the clinical interpretation of genetic variants globally to ensure accuracy and consistency in genetic diagnostics. These discussions highlighted how the Fourth Industrial Revolution will ripple through clinical laboratory medicine.

In the general session on transfusion medicine and cell therapy, a report studying xenotransfusion caught my attention. Swine RBCs, when transfused into non-human primates, rapidly recovered hemoglobin levels, but induced severe immune reactions with subsequent major organ damage. These evidence suggest there is a long road to clinical application. As a BLS, I was interested in a report to evaluate the effects of IL-2 on freshly thawed CAR-NK cells: an alternative to allogeneic CAR-T cells. The authors found that IL-2 stimulation enhanced the recovery rates and prolonged cell viability, suggesting a promising implication for future clinical applications. However, there were no reports on AI or big data utilization in transfusion and cell therapy, indicating an area with untapped potential.

LMCE 2024 officially ended with the Invited Dinner at the Grand Walkerhill Seoul Hotel after three enriching days (Fig. 2), but unfortunately, I had no time to attend. I also learned a lot about automated testing apparatus and TMS in addition to the latest blood transfusion and cell therapy as described above, which are inevitable for future departments of blood transfusion. Thus, I believe JSTMCT should maintain its connection with KSLM, and I hope this report encourages

personnel involved in blood transfusion to attend LMCE in the near future.

Finally, I would like to express my gratitude to Dr. T. Nakayama for his invaluable guidance and support in preparation for my participation in this conference.

Figure 2. Invited Dinner at the Grand Walkerhill Seoul Hotel

Announcement

Join us in Yokohama to shape the future of medicine!

An invaluable opportunity to explore new horizons in safe transfusion and cell therapy.

The 74th Annual Meeting of the JSTMCT

May 14-16, 2026
PACIFICO Yokohama North

Announcement

Kuala Lumpur Awaits!

ISBT International Congress 2026

20–24 June 2026 in Kuala Lumpur, Malaysia

Be part of the leading global event in transfusion medicine. Learn, connect, and experience Malaysia.

Save the date – More details soon.

…and more,

Announcement

Coming to Japan in 2028!

ISBT International Congress 2028

4–8 June 2028 in Yokohama, Japan

Join colleagues from around the globe to share cutting-edge research, exchange ideas, and explore the latest advances in transfusion medicine and related fields.

Save the date – we look forward to welcoming you!