

Active Hemovigilance of Pediatric Patients Supported with Plasma Components Prepared with Photochemical Treatment (INTERCEPT)

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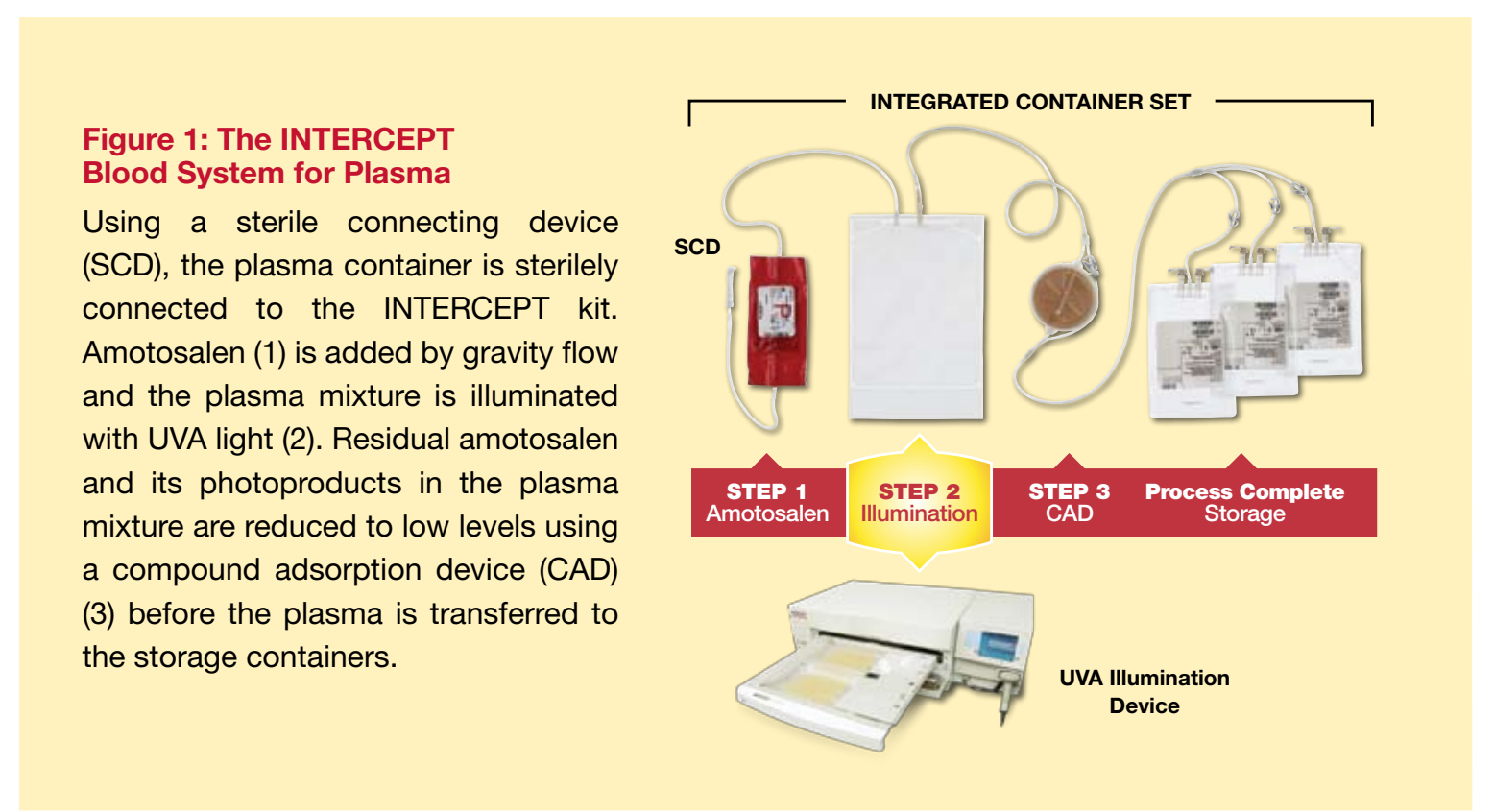


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Background

Platelet components photochemically pathogen inactivated using the INTERCEPT Blood System™ have been transfused in routine clinical practice to a broad patient population in Europe for 5 years. Transfusion of INTERCEPT™ platelets to pediatric patients has been shown to be safe and effective (Van Haute 2006, Rasongles 2009).^{1,2} The INTERCEPT Blood System was also CE Marked in 2006 for pathogen inactivation of plasma components and has been in clinical use for 2 years. To establish a post-approval commercial use safety database, an active hemovigilance (HV)

program was implemented for transfusion of INTERCEPT plasma components (IPL). An electronic data capture system (EDCS) was used to collect data over the internet on a real time basis. EDCS accommodates data collected at multiple sites over extended periods of time to gather safety information on routine transfusion of IPL. This HV program is ongoing. To date, the safety profile of 6,359 transfusions comprised of 16,245 units of IPL have been documented (Cazenave 2009).³ Among the 6,359 transfusions, a significant number of IPL transfusions were administered to patients ≤18 years old.



Aims

The current study evaluated the transfusion safety profile in pediatric patients receiving IPL. Results of 1,029 IPL transfusions in pediatric patients including infants are reported.

Methods

Blood centers participating in this study produced IPL (approximately 200 mL per component) in routine practice. Plasma transfusions were ordered by primary care physicians per standard of care. This study assessed the response to all study IPL transfusions within the first 24 hours. The primary endpoint was the incidence of acute transfusion reactions (ATR). An ATR was defined as an adverse event

(AE) possibly related, probably related, or related to the plasma transfusion. For each transfusion, patient demographics and primary diagnosis/therapy were recorded regardless of whether an AE was observed. For AEs, the following data were collected: time of event following transfusion, clinical description, objective clinical parameters (vital signs), results from clinical and laboratory tests

(radiographs, bacterial cultures), severity (grade 0-4), serious or non-serious nature, and causal relationship (unrelated, probably unrelated, possibly related, probably related, or related). Patients were followed for 7 days following each IPL transfusion for occurrence of serious adverse events (SAE).

Results

This report included 1,029 transfusions, comprised of 1,641 units of IPL, administered to 348 pediatric patients (61.8% male, 38.2% female). The mean age was 4.2 years (160 children between 1-18 years, 188 infants <1 year). Of the 348 patients, 109 (31.3%) received IPL transfusions for a hematologic disorder (including 3 with congenital coagulation deficiency, 101 with acquired coagulopathy, and 2 with TTP), 83 (23.9%) for surgery,

156 (44.8%) with another diagnosis as an indication for plasma transfusion (Table 1). Of all patients, 153 (44%) patients had previous transfusions, of which 63 (18.1%) patients received INTERCEPT platelets. The distribution of diagnosis among the two age groups was similar with the exception that both TTP patients were in the 1-18 year group. The majority of infants (< 1 year old) received IPL transfusions in intensive care units while majority of children (1-18 years)

received IPL transfusion in regular hospital wards. The average number of transfusions per patient was 3.0 transfusions (range 1-55, median 2.0). Each patient received a mean of 4.7 units of IPL (range 1-99, median 2.0) (Table 2). Compared to frequency of transfusions in infants (<1 year), older pediatric patients (1-18 years) received on average higher numbers of transfusions and plasma components (3.4 transfusion/7.0 IPL vs. 2.6 transfusion/2.7 IPL). Patients

1-18 years old with hematology diseases received more transfusions and plasma products (mean 4.7 txn/7.5 IPL) than other diseases. One patient with congenital coagulation deficiency and two patients with TTP in 1-18 yrs age group received the largest number of transfusions and IPL products (Table 3). Among the 1,029 transfusions, no AE, ATR, SAE, deaths or episodes of TRALI due to an IPL transfusion were reported.

Table 1: Demographics of Pediatric Patients Transfused with INTERCEPT-Plasma (IPL)^a

Demographic	Total Patients (<1-18 yrs) n=348	Children (1-18 yrs) n=160	Infants (<1 yr) n=188
Gender			
male	215 (61.8%)	106 (66.3%)	109 (58.0%)
female	133 (38.2%)	54 (33.8%)	79 (42.0%)
Age (yrs)			
Mean±SD	4.2 ± 6.2	9.2 ± 6.1	NA ^b
Range	<1 to 18	1-18	<1
Care location			
Intensive care unit	218 (62.6%)	64 (40%)	154 (81.9%)
Non-intensive care unit	129 (37.1%)	95 (59.4%)	34 (18.1%)
Outpatient	1 (0.3%)	1 (0.6%)	0 (0%)
Hematology patients	109 (31.3%)	56 (35.0%)	53 (28.2%)
Congenital coagulopathy	3 (2.8%)	1 (1.8%)	2 (3.8%)
Acquired coagulopathy	101 (92.7%)	51 (91.0%)	50 (94.3%)
Immunodeficiency	3 (2.8%)	2 (3.6%)	1 (1.9%)
TTP	2 (1.8%)	2 (3.6%)	0 (0%)
Surgery patients	83 (23.9%)	39 (24.4%)	44 (23.4%)
Other patients	156 (44.8%)	65 (40.6%)	91 (48.4%)

a. The number of patients (n) and the proportion (%) within each category are presented.
b. Age for infants was recorded as <1 year. NA=not applicable.

Table 2: INTERCEPT-Plasma and Patient Characteristics

	Number of Transfusions (total=1,029)
Plasma Type	
Apheresis	1,029 (100%)
Whole blood	0 (0%)
Plasma components	1,641 (100%)
	Number of Patients (total=348)
Previous transfusion history	153 (44.0%)
Previous transfusion of I-platelets	63 (18.1%)
Plasma use per patient	
Mean number transfusions ±SD (range)	3.0 ± 4.7 (1-55)
Mean number plasma units ±SD (range)	4.7 ± 9.1 (1-99)

Table 3: Transfusion Frequency per Patient by Age Group and Diagnosis (Mean ±SD txns or IPL units)

Patient Population	Children (1-18 yrs) n=160	Infants (<1 yr) ^a n=188
	Number of transfusions (Mean ±SD)	
Hematology patients	4.7 ± 8.9	2.7 ± 2.7
Congenital coagulopathy	36.0 ^b	1.0 ± 0
Acquired coagulopathy	3.3 ± 3.7	2.8 ± 2.8
Immunodeficiency	1.5 ± 0.7	1.0 ^b
TTP	28.0 ± 38.2	
Surgery patients	2.0 ± 3.2	3.3 ± 4.5
Other patients	3.1 ± 3.9	2.2 ± 2.4
Total	3.4 ± 6.1	2.6 ± 3.1
	Number of IPL units (Mean ±SD)	
Hematology patients	7.5 ± 12.0	2.7 ± 2.7
Congenital coagulopathy	37 ^b	1.0 ± 0
Acquired coagulopathy	6.1 ± 8.1	2.8 ± 2.8
Immunodeficiency	4.0 ± 2.8	1.0 ^b
TTP	34.0 ± 46.7	
Surgery patients	2.9 ± 3.5	3.7 ± 4.6
Other patients	9.1 ± 15.9	2.3 ± 2.4
Total	7.0 ± 12.7	2.7 ± 3.2

a. Volume of IPL transfused is based on the body weight of an infant. Any transfusion with a volume up to approximately 200 mL was counted as one IPL.
b. Standard deviation was not calculated based on one patient's data.

Conclusions

- In this study, no acute transfusion reactions or serious transfusion reactions with IPL transfusions were reported in pediatric patients including infants.
- Routine IPL transfusion is safe and well tolerated in the pediatric patient population, including those with hematological diseases.

References

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