The 65th ASH Annual Meeting Abstracts

POSTER ABSTRACTS

311.DISORDERS OF PLATELET NUMBER OR FUNCTION: CLINICAL AND EPIDEMIOLOGICAL

Platelet Count Response to Obstetrical Use of IVIG for Maternal Thrombocytopenia: A 14-Year Retrospective Study

Roy Khalife, MD MHPE [1,2], *Bonnie T Niu, BSc* [3], *Iris Perelman, MSc* [1], *Darine El-Chaar, MD* [4,1], *Dean Fergusson, PhD* [2,5], *Alan Karovitch, MD MD* [4,2], *Johnathan P. Mack, MD MSc* [2,1], *Melanie Tokessy* [6], *Kathryn Elizabeth Webert, MD MSc* [7,8], *Alan T. Tinmouth, MD MSc* [2,1,9]

[1] Ottawa Hospital Research Institute, Ottawa, Canada
[2] Department of Medicine, University of Ottawa, Ottawa, Canada
[3] Faculty of Medicine, University of Ottawa, Ottawa, Canada
[4] Department of Obstetrics and Gynecology, University of Ottawa, Ottawa, Canada
[5] Ottowa Hospital Research Institute, Ottawa, Canada
[6] Eastern Ontario Regional Laboratory Association, Ottawa, Canada
[7] Canadian Blood Services, Ancaster, Canada
[8] Department of Medicine and the Department of Molecular Medicine and Pathology, McMaster University, Hamilton, Canada
[9] Canadian Blood Services, Ottawa, Canada

Introduction:
Thrombocytopenia affects approximately 10% of pregnant individuals with Gestational Thrombocytopenia (GT) accounting for 80% of cases and Immune Thrombocytopenia (ITP) representing 3% of cases. Distinguishing between GT and ITP is challenging, leading to many pregnant individuals with moderate thrombocytopenia receiving treatment for 'possible ITP' with Intravenous Immunoglobulin (IVIG) in attempt to raise platelet counts (PLT) for safe labor and delivery and to potentially allow for neuraxial anesthesia. However, evidence on the impact of IVIG on PLT during pregnancy remains limited, and predictive factors for IVIG response are lacking. We aim to investigate the effect of IVIG on PLT in pregnant individuals with moderate thrombocytopenia (PLT $< 100 \times 10^9$/L). The specific objectives are to assess the incremental response in maternal PLT following IVIG administration, the proportion of PLT exceeding 80×10^9/L after IVIG administration, the proportion of incremental increase in PLT by more than 20×10^9/L following IVIG administration, and to identify factors associated with these outcomes.

Methods:
We conducted a retrospective cohort study using administrative and chart review data between 2007-2020. We included all pregnant individuals who received IVIG for moderate thrombocytopenia. Data collected encompassed parameters such as age, gestational age at delivery, platelet counts at various timepoints, highest immature platelet fraction (IPF) during pregnancy, IVIG dose and frequency, hemoglobin levels, transfusions, and corticosteroid use. Data were analyzed using descriptive statistics. Paired *t*-test was used to compare means of PLT pre- and post-IVIG administration. Simple logistic regression was used to assess predictors of PLT $\geq 80 \times 10^9$/L and PLT increment $\geq 20 \times 10^9$/L post-IVIG.

Results:
Out of 651 deliveries with moderate thrombocytopenia, 79 (12.1%) received IVIG for a total of 4,527.50 grams and a median dose of 60 g (IQR: 30 - 77.5). Excluding 22 pregnancies due to other interventions such as platelet transfusions (n=12), corticosteroids (n=7), or both (n=3), 57 remained for analysis. The median incremental response in PLT following IVIG administration was 27 $\times 10^9$/L (IQR: 3-94). Pre-IVIG PLT median was 65 $\times 10^9$/L (IQR: 48-73), and post-IVIG PLT median was 98 $\times 10^9$/L (IQR: 69-142). PLT increment $\geq 20 \times 10^9$/L following IVIG was observed in 54.4% (31/57) of deliveries, and 57.9% (33/57) of deliveries achieved PLT $\geq 80 \times 10^9$/L following IVIG administration. Mean PLT post-IVIG (M = 112.51 $\times 10^9$/L, SD 55.88) were significantly greater than pre-IVIG PLT (M = 59 $\times 10^9$/L, SD = 19.71) by 53.51 points, $p = < .001$.
Nadir PLT < 30 in pregnancy was associated with a statistically significant increase in PLT $\geq 80 \times 10^9$/L following IVIG (odds ratio (OR) = 6.29, 95% confidence interval (CI) = 1.25-31.51, p < 0.05) and PLT increment $\geq 20 \times 10^9$/L (OR = 7.58, 95% CI = 1.51-38.05, p < 0.05). An IPF < 16% was also associated with a statistically significant increase in PLT $\geq 80 \times 10^9$/L (OR = 4.85, 95% CI = 1.08-21.76, p < 0.05) and PLT increment $\geq 20 \times 10^9$/L (OR = 4.85, 95% CI = 1.08 - 21.76, p < 0.05). Moreover, a

post-IVIG PLT increment $\geq$ 20 x10 ^{9}/L was positively associated with pre-IVIG PLT below 50 x10 ^{9}/L (OR = 8.67, 95% CI = 1.73 - 43.33, p < 0.05), but negatively associated with PLT 70-100 x10 ^{9}/L (OR = 0.18, 95% CI = 0.05 - 0.57, p < 0.05).

For post-IVIG PLT $\geq$ 80 x10 ^{9}/L, there were no statistically significant relationships with gestational age, maternal age, pre-pregnant PLT or pre-IVIG PLT. Similarly, for post-IVIG PLT increment $\geq$ 20 x10 ^{9}/L, there were no statistically significant relationships with GA, maternal age, pre-pregnant PLT, or a pre-IVIG PLT between 50-69 x10 ^{9}/L.

Conclusions:

IVIG administration shows promising results for pregnant individuals with moderate thrombocytopenia. The study highlights the importance of nadir PLT in pregnancy, IPF levels, and pre-IVIG PLT as potential factors influencing the response to IVIG treatment. Our study is limited by its retrospective and single-centered design, and small sample size. Nevertheless, these findings generate hypotheses and could inform future prospective multicenter studies to optimize IVIG administration in this setting, considering its effectiveness and potential risks while minimizing costs.

Disclosures No relevant conflicts of interest to declare.

Table 1. Demographic Variables and Outcomes Data

		N	Median (IQR 25th—75th)
Age		79	32 (29—35)
Gestational age at delivery		79	33.50 (30.75—36.25)
Lowest available pre-pregnancy platelet count (x10⁹/L)		69	76 (41—123)
Lowest platelet count during pregnancy (x 10⁹/L)		79	48 (29.4—64)
Highest Immature Platelet Fraction recorded during pregnancy		55	21.2 (14.2—28.65)
Platelet count at time of delivery (x10⁹/L)		79	76 (56.5—108.5)
Hemoglobin level at time of delivery (g/L)		79	121 (111—129)
IVIG dosing per delivery		79	60 (30—77.5)
		N	Frequency (%)
Deliveries with pre-pregnancy PLT count below 100 x 10⁹/L		69	43 (62.3)
Deliveries with pre-pregnancy PLT count below 150 x 10⁹/L		69	62 (89.9)
Deliveries in which corticosteroids were used		79	10 (12.7)
Deliveries requiring pre-delivery PLT transfusions		79	15 (19.0)
Deliveries requiring postpartum PLT transfusions		79	2 (2.5)
Deliveries requiring postpartum PRBC transfusions		79	4 (5.1)
Deliveries requiring postpartum FP transfusions		79	1 (1.3)
		N	Median (IQR 25th—75th)
Outcomes for all deliveries	Pre-IVIG PLT count (x 10⁹/L)	79	62 (48.5—73)
	Post-IVIG PLT count (x10⁹/L)	79	79 (62—132.5)
	Incremental PLT count response (x10⁹/L)	79	16 (1—82)
Outcomes for deliveries excluding pre-delivery corticosteroids or platelet transfusions use	Pre-IVIG PLT count (x 10⁹/L)	57	65 (48—73)
	Post-IVIG PLT count (x 10⁹/L)	57	98 (69—142)
	Incremental PLT count response (x 10⁹/L)	57	27 (3—94)

Table 2. Results from simple logistical regression of factors associated with (panel A) platelet count of 80 x10⁹/L or higher, and (panel B) platelet count increment of 20 x10⁹/L or higher following IVIG administration for labor and delivery.

Panel A	Platelet count following IVIG administration				
	Platelet count (x10⁹/L)		Logistical Regression for PLT = 80 x10⁹/L		
	< 80 (N=24)	= 80 (N=33)	OR	95% CI	p-value
Gestational age (weeks), n (%)					
< 37 weeks	3 (12.5)	8 (24.2)	2.24	0.53 – 9.53	0.28
= 37 weeks	21 (87.5)	25 (75.8)	0.45	0.11 – 1.90	
Age (years), n (%)					
< 35	15 (62.5)	24 (72.7)	1.60	0.52 – 4.94	0.41
= 35	9 (37.5)	9 (27.3)	0.63	0.20 – 1.93	
Lowest PLT recorded in pregnancy (x10⁹/L), n (%)					
< 30	2 (8.3)	11 (33.3)	6.29	1.25 – 31.51	0.025
= 30	22 (91.7)	22 (66.7)	0.16	0.03 – 0.80	
Pre-pregnancy PLT (x10⁹/L), n (%)					
< 100	12/21 (57.1)	19/29 (65.5)	1.23	0.39 – 3.85	0.73
= 100	9/21 (42.9)	10/29 (34.5)	0.82	0.26 – 2.56	
Immature Platelet Fraction (%), n (%)					
< 16	3/19 (15.8)	10/21 (47.6)	4.85	1.08 – 21.76	0.039
= 16	16/19 (84.2)	11/21 (52.4)	0.21	0.05 – 0.93	
Pre-IVIG PLT (x10⁹/L), n (%)					
< 50	4 (16.7)	11 (33.3)	2.50	0.69 – 9.13	0.17
50—69	9 (37.5)	12 (36.4)	0.95	0.32 – 2.83	0.93
70—100	11 (45.8)	10 (30.3)	0.51	0.17 – 1.53	0.23
Panel B	Platelet count increment following IVIG administration				
	PLT increment (x10⁹/L)		Logistical Regression for PLT increment = 20 x10⁹/L		
	< 20 (N=26)	= 20 (N=31)	OR	95% CI	p-value
Gestational age (weeks), n (%)					
< 37 weeks	3 (11.5)	8 (25.8)	2.67	0.63 – 11.34	0.184
= 37 weeks	23 (88.5)	23 (74.2)	0.38	0.89 – 1.59	
Age (years), n (%)					
< 35	17 (65.4)	22 (71.0)	1.29	0.42 – 3.97	0.652
= 35	9 (34.6)	9 (29.0)	0.77	0.25 – 2.37	
Lowest PLT recorded in pregnancy (x10⁹/L), n (%)					
< 30	2 (7.7)	11 (35.5)	7.58	1.51 – 38.05	0.014
= 30	24 (92.3)	20 (64.5)	0.13	0.03 – 0.66	

Figure 1

https://doi.org/10.1182/blood-2023-189377