

Retrospective Evaluation of High Titer Convalescent Plasma in Hospitalized Patients with COVID-19 Infection in Northern Colorado

John-Michael Benson (1), Amanda Barzak (2) Steven R. Schuster (2) and Daniel Monkowski (2)

1- University of Colorado School of Medicine 2 - UCHealth - University of Colorado Health System



INTRODUCTION:

- Globally more than five and a half million people have died as a result of COVID-19. Convalescent plasma (CP) has been studied as a potential treatment and has produced mixed results. Currently, the Infectious Diseases Society of America recommends against the use of CP outside of clinical trials.
- Studies supporting CP suggest that early transfusion and high titer status are important variables.
- There have been only two studies published using both high titer and symptom onset (as opposed to hospital admission) as a measure of disease course.

PURPOSE:

To determine if high titer CP given within three days of symptom onset leads to different clinical outcomes than those transfused later than three days or not transfused at all during their hospital admission for COVID-19

METHODS:

Time period: 9/17/20- 2/3/21

Hospitals: PVH, GH, MCR

- 1,137 patients admitted for COVID-19
- 587 Transfused, 550 Not Transfused
- 329 Transfused with High Titer CP

Analysis:

- 238 Charts reviewed
- 138 Patients received high titer CP (**CPHIGH**)
 - 25 within 3 days of symptom onset (**CP3**)
 - 113 later than three days (**CPLate**)
- 100 Patients not receiving CP (**Control**)

Endpoints:

- Primary: Mortality
- Secondary: Days in Hospital, Intubation Status

Data collection/analysis: REDCap, Epic, Garth Englund, Excel, CIDA

Figure 1: Flowchart of subject study population

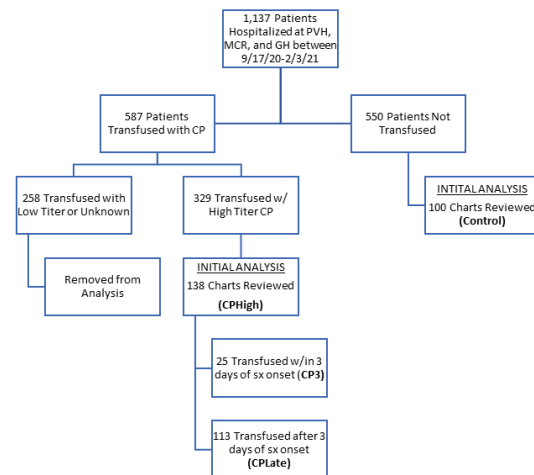


Figure 1 - Bold indicates group studied individually

RESULTS:

Table 2: Number of patients in each subgroup meeting outcome measures

	CP3 (n=25)		CPLate (n=113)		CPHigh (n=138)		Control (n=100)	
	#	%	#	%	#	%	#	%
Discharged Alive	23	92%	98	87%	121	88%	85	85%
Inpatient Deceased	2	8%	15	13%	17	12%	15	15%
Intubated								
Yes	2	8%	17	15%	19	14%	11	11%
No	23	92%	96	85%	119	86%	89	89%
Hospital Days admitted	8.35 +/- 11.14		9.81 +/- 11.83		9.53 +/- 11.67		6.78 +/- 9.15	

Table 3: Statistical comparisons of outcome measures between groups

	CP3 vs Control		CPLate vs Control		CPHigh Vs Control	
Mortality						
P-Value	0.36		0.47		0.72	
Odds Ratio	0.49		0.57		0.87	
Intubation Status						
P-Value	0.66		0.35		0.38	
Odds Ratio	0.70		0.49		1.43	
Hospital Days admitted						
P-Value	0.49		0.59		0.06	

CONCLUSIONS:

- The literature surrounding CP use as a treatment for COVID-19 is mixed, but recent studies have emphasized the importance of using only high titer units early in the disease course.
- While not statistically significant, there is a positive trend in our results to support the claim that those transfused early have the best outcomes.
- This is best demonstrated by a 51% lower likelihood of mortality in the CP3 group versus control group, and only a 13% reduction in mortality in the CPLate group versus control group.
- Our results highlight the importance of using date of symptom onset, as opposed to admission date, as a critical metric to stratify if a patient will benefit from high titer CP administration in treating COVID-19.

Acknowledgements:

REDCap (NIH/NCATS Colorado CTSA Grant Number UL1 TR002535)
Garth Englund Blood Bank
Center for Innovative Design and Analysis (CIDA)