Intravenous plasma therapy in two family members with autism

Keywords: Brain derived neurotrophic factor (BDNF), Intravenous, plasma, plasma growth factors, neurogenesis, autologous, autism

Abstract: The use of platelet-rich plasma has been a common alternative treatment within the field of regenerative medicine. With over 30 years of use and thousands of published research articles in various disciplines and treatment applications, the safety and efficacy of local administration (site specific) PRP is well understood. However, the intravenous administration of plasma treatments and the extent of its treatment benefits is not known. Here, we report the case of two family members with autism who received a dose specific TruDOSE™ intravenous plasma.

Case Report: This case report highlights the rapid and significant changes to various neurological domains measured by CNS Vital Signs (CNSVS)[1] in two autistic family members following an intravenous TruDOSE™ plasma treatment. Baseline CNSVS measurements were recorded before treatment and then measured again at the 5 month follow up.

Therapeutic Intervention: Following informed consent, each patient received a dose specific TruDOSE™ intravenous plasma treatment with no adverse events observed.

History: The two autistic patients are a brother and sister: a nine-year-old female and an 18-year-old male. The mother describes both kids suffering from sensory disorders (sights and sounds) and having major social anxiety. Other than grandma, both kids were simply incapable of interacting with others, even with people the family knew personally. Due to the academic social delays of the 18-year-old, he has been home schooled since the 5th grade. The 9-year- old has only known home school for the same reasons. The mother comments she has sought out every treatment imaginable; natural therapies, active therapies, protocols, learning programs, and various interventions for both kids. She describes the various treatments making marginal gains but there would always be regression within a short period of time if not directly in the program or working with the specialist. Collectively, the mother reasonably remarks they have spent well over a $100,000 for treatments in total for both kids.

Clinical Progression: Baseline and 5-month CNS measurements are below, as well as direct quotes from the mother.

Discussion: Blood vessels are critical for any tissue to survive, especially neurons. Neurons and blood vessels within a healthy brain resemble a healthy tree with a fully branched canopy. There's a trunk, a root system and there are the branches, called dendrites. **Dendritic arborization**, also known as **dendritic branching**, is a multi-step biological process by which neurons form new dendritic trees and branches to create new synapses.[2] A healthy brain will resemble a branched network connecting different parts of the brain to create uninterrupted neural communication. This connected network of synapses seamlessly communicates together to create speech, memory, social interactions, and other aspects of the nervous system. Conversely, imaging from postmortem[3] autistic brains reveal neurons and blood vessels that resemble a diseased tree. Injured brains form a network of splitting vascular and neuron branches that create knots that new branches form. These malformed brain characteristics can also be seen with other neurological conditions like depression, schizophrenia, Down syndrome, and anxiety. Therefore, it seems reasonable that a treatment encouraging healthy neuron and vasculature growth could help reconnect the synaptic network and potentially improve various neurological domains.

The current case report reveals the significant CNS measurement improvements as well as quality of life improvements in two autistic patients. Platelets within the TruDOSE™ plasma treatment possess growth factors that specifically encourage neuron (BDNF) and vascular growth (VEGF). The historical evidence regarding both growth factors is well documented and one can easily suggest these two patients are experiencing healthy dendritic branching. One interesting note is the 18-year old's CNS scores, where his composite memory, visual memory and reaction time became average. On the surface one can say these domains regressed; however, we believe there is another explanation. It is commonly understood the autistic brain (or other like conditions i.e. Asperger's) hyper accelerates one aspect, while other aspects of the brain become delayed. Similarly, if one becomes blind, the body heightens other senses, like hearing, to bring balance or homeostasis. This phenomenon is how the body continually strives for a state of balance or homeostasis. In the case of the 18-year-old, the new neuron connections increased function of the other CNS domains causing the three hyper accelerated domains to normalize to a state of brain homeostasis. In conclusion, these early results provide a promising holistic treatment for those with autism.

[1] CNSVS is a computerized neurocognitive test battery consisting of seven tests: verbal and visual memory, finger tapping, symbol digit coding, the Stroop Test, a test of shifting attention and the continuous performance test.
[2] https://www.sciencedaily.com/releases/2016/04/160427150908.htm. Richard C. Lewis. 2016. University of Iowa.
[3] Azmitia et al. 2016. Persistent angiogenesis in the autism brain: An immunocytochemical study of postmortem cortex, brainstem and cerebellum

Clinical Progression: **18-year-old**. CNS measurements. **First image** - baseline. **Second image** – 5 month follow up.

CNS Vital Signs Report			Test Date: June 10, 2021 15:19:08
Patient ID:			Administrator:
Age: 17			Language: English (United States)
Total Test Time: 45:21 (min:secs)	CNSVS Duration: 44:34 (min:secs)		CNSVS Online Version 1.1.15

Patient Profile	Percentile Range				> 74	25 - 74	9 - 24	2 - 8	< 2
	Standard Score Range				> 109	90 - 109	80 - 89	70 - 79	< 70
Domain Scores	Patient Score	Standard Score	Percentile	VI**	Above	Average	Low Average	Low	Very Low
Neurocognition Index (NCI)	NA	75	5	No				X	
Composite Memory	106	112	79	Yes	X				
Verbal Memory	55	109	73	Yes		X			
Visual Memory	51	110	75	Yes	X				
Psychomotor Speed	143	79	8	Yes				X	
Reaction Time*	527	120	91	No	X				
Complex Attention*	34	12	1	No					X
Cognitive Flexibility	14	54	1	No					X
Processing Speed	35	70	2	Yes				X	
Executive Function	36	84	14	Yes			X		
Social Acuity	6	86	18	Yes			X		
Reasoning	5	91	27	Yes		X			
Working Memory	10	98	45	No		X			
Sustained Attention	15	76	5	No				X	
Simple Attention	35	54	1	Yes					X
Motor Speed	108	94	34	Yes		X			

CNS Vital Signs Report			Test Date: November 16, 2021 00:19:59
Patient ID:			Administrator:
Age: 18			Language: English (United States)
Total Test Time: 39:36 (min:secs)	CNSVS Duration: 39:01 (min:secs)		CNSVS Online Version 1.1.16

Patient Profile	Percentile Range				> 74	25 - 74	9 - 24	2 - 8	< 2
	Standard Score Range				> 109	90 - 109	80 - 89	70 - 79	< 70
Domain Scores	Patient Score	Standard Score	Percentile	VI**	Above	Average	Low Average	Low	Very Low
Neurocognition Index (NCI)	NA	96	40	Yes		X			
Composite Memory	100	100	50	Yes		X			
Verbal Memory	50	91	27	Yes		X			
Visual Memory	50	107	68	Yes		X			
Psychomotor Speed	136	75	5	Yes				X	
Reaction Time*	626	100	50	Yes		X			
Complex Attention*	8	103	58	Yes		X			
Cognitive Flexibility	47	101	53	Yes		X			
Processing Speed	33	67	1	Yes					X
Executive Function	50	103	58	Yes		X			
Social Acuity	10	109	73	Yes		X			
Reasoning	3	84	14	Yes			X		
Working Memory	8	91	27	No		X			
Sustained Attention	13	73	4	No				X	
Simple Attention	37	77	6	Yes				X	
Motor Speed	101	89	23	Yes			X		

6-month direct quotes from mom:

- *My son would stay in his room all day because of the social anxiety and he did not know how to make friends. No matter what we tried he would not interact with friends.*
- *Now (after the treatment), we can't keep him home. He wants to stay the night with people. He now goes to the gym. He got himself a job. He has his own bank account and he's even graduating high school this year now.*
- *Before he would not take his driving test, because he knew he would fail it… plus he had social anxiety and he did not want to be around strangers to take the test.*
- *After the treatment, he passed his drivers test on the first try without studying. He now drives himself places by himself and being around strangers doesn't bother him anymore.*
- *In fact, he actually went on a graduation retreat with other home-schooled kids his age, kids he had never met. He went on this retreat by himself, made friends, and has now joined social groups of these friends and wanting to meet up and be part of all their social interactions.*
- *Nobody would ever thought, none of our friends, that my son would be able to be a self-sufficient adult and we have prepared to have him live with us.*

Clinical Progression: **9 year old**. CNS measurements. **First image** - baseline. **Second image** – 5 month follow up.

CNS Vital Signs Report		Test Date: June 10, 2021 14:03:06
Patient ID: [redacted]		Administrator: [redacted]
Age: 9		Language: English (United States)
Total Test Time: 51:05 (min:secs)	CNSVS Duration: 50:49 (min:secs)	CNSVS Online Version 1.1.15

Patient Profile	Percentile Range				> 74	25 - 74	9 - 24	2 - 8	< 2
	Standard Score Range				> 109	90 - 109	80 - 89	70 - 79	< 70
Domain Scores	Patient Score	Standard Score	Percentile	VI**	Above	Average	Low Average	Low	Very Low
Neurocognition Index (NCI)	NA	56	1	No					X
Composite Memory	66	27	1	Yes					X
Verbal Memory	34	27	1	Yes					X
Visual Memory	32	53	1	Yes					X
Psychomotor Speed	111	95	37	Yes		X			
Reaction Time*	1134	57	1	Yes					X
Complex Attention*	60	42	1	No					X
Cognitive Flexibility	-26	59	1	No					X
Processing Speed	18	82	12	Yes			X		
Executive Function	-13	71	3	No				X	
Social Acuity	5	86	18	Yes			X		
Reasoning	2	91	27	Yes		X			
Working Memory	-1	71	3	No				X	
Sustained Attention	-27	34	1	No					X
Simple Attention	21	51	1	No					X
Motor Speed	91	104	61	Yes		X			

CNS Vital Signs Report		Test Date: November 14, 2021 15:06:59
Patient ID: [redacted]		Administrator: [redacted]
Age: 9		Language: English (United States)
Total Test Time: 46:57 (min:secs)	CNSVS Duration: 46:22 (min:secs)	CNSVS Online Version 1.1.16

Patient Profile	Percentile Range				> 74	25 - 74	9 - 24	2 - 8	< 2
	Standard Score Range				> 109	90 - 109	80 - 89	70 - 79	< 70
Domain Scores	Patient Score	Standard Score	Percentile	VI**	Above	Average	Low Average	Low	Very Low
Neurocognition Index (NCI)	NA	83	13	Yes			X		
Composite Memory	79	56	1	Yes					X
Verbal Memory	38	43	1	Yes					X
Visual Memory	41	83	13	Yes			X		
Psychomotor Speed	111	95	37	Yes		X			
Reaction Time*	984	79	8	Yes				X	
Complex Attention*	28	94	34	Yes		X			
Cognitive Flexibility	2	89	23	Yes			X		
Processing Speed	22	88	21	Yes			X		
Executive Function	5	91	27	Yes		X			
Social Acuity	12	123	94	Yes	X				
Reasoning	-3	77	6	Yes				X	
Working Memory	3	84	14	No			X		
Sustained Attention	16	89	23	No			X		
Simple Attention	33	90	25	Yes		X			
Motor Speed	87	100	50	Yes		X			

6-month direct quotes from mom:

- *First of all, she is home schooled to provide one on one instruction because she needs it. Part of her disability is she cannot handle social interaction with the sensory and stress…even with people she knows.*
- *She **should** be at a 3rd grade level for reading and math along with her peers.*
- *(Before the treatment) She started out at a kindergarten level of math and reading. Within 30 days she's now doing mental math and feels that showing her work on paper is below her. She has blown through all of the lessons in such a short amount of time and is caught up. She has essentially gone from K to 3rd grade level and essentially three years of math in just 3 months.*

- *For her reading, we had her on several different development programs trying to get her caught up. After the treatment, she started blowing through all of them [the reading programs] and accelerated so fast that now she reads on level books.*
- *She has overcome the social interaction disability and now when we interact with people she speaks for herself.*
- *Now, we are testing for her to go to public school because she has requested it.*

- *She was completely nonverbal as toddler up to the age of 5. She would only sign to me and we have always had her in speech therapy which has helped but hasn't overcome the need for the therapy.*
- *Last week we had her tested for the speech therapy again, and her therapists said she does not need therapy anymore.*