

# **SARS-CoV-2 vaccination and immune thrombotic thrombocytopenic purpura**

## **SUPPLEMENTAL DATA**

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**Table S1. Details of iTTP recurrence after COVID-19 vaccines in the multicenter (Johns Hopkins University, University of Minnesota, Ohio State University) cohort**

Site	Age/ Sex	Vaccine type / dose	Days since vaccine dose	ADAMTS13 activity within 3 months pre- vaccine	Platelet count / ADAMTS13 at diagnosis of relapse	Symptoms	Treatment and outcome
OSU	28/F	Pfizer / 1st	6	< 2%	57 x 10 <sup>9</sup> /L, <5%	Petechiae, ataxia, and slurred speech	Caplacizumab, rituximab, and corticosteroids without plasma exchange. Platelet count normal in 24 hours and ADAMTS13 60% at 9 weeks.
JHU	34/F	Moderna/ 2 <sup>nd</sup>	35	Unknown	5 x 10 <sup>9</sup> /L, <5%	Headache, left arm weakness	Plasma exchange, corticosteroids, and rituximab. Platelet count normal after 5 days, ADAMTS13 normalization (78%) at 25 days from diagnosis.
JHU	56/F	Pfizer / 2 <sup>nd</sup>	52	100%	134 x 10 <sup>9</sup> /L, 19%	Fatigue	Thrombocytopenia was likely due to a myeloid disorder rather than clinical iTTP relapse.  Received plasma exchange, steroids, rituximab and recovered ADAMTS13 activity (>100%) at two weeks but thrombocytopenia persisted. Bone marrow biopsy revealed a clonal myeloid disorder most consistent with chronic myelomonocytic leukemia (hypercellular marrow with 60% monocytes, del 20q and KRAS mutation).
Minn	35/F	Pfizer / 1st	143	Unknown	22 x 10 <sup>9</sup> /L, <5%	Fatigue, cognitive impairment	Plasma exchange, corticosteroids and rituximab. Platelet count normalization after 5 days of plasma exchange.

**Table S2. Details of iTTP cases after mRNA COVID-19 vaccines reported in VAERS**

VAERS no	Vaccine type	Age	Sex	Dose no.	Time since dose	Symptoms	Platelet count (x10 <sup>9</sup> /L)	AD13 activity	Notes on treatment and outcome	Certainty of TTP Diagnosis
1407787-1	Moderna	19	F	2	51	Purpuric rash, thrombocytopenia	4	NR	NR	Possible
1470412-1	Moderna	25	F	1	29	Epistaxis, thrombocytopenia, anemia	7	NR	PEX, IVIG, steroids, Steroids, multiple other drugs (unspecified)	Possible
1574026-1	Moderna	25	F	2	0	Thrombocytopenia	16	NR	Patient died, treatment NR	Probable
1159611-1	Moderna	22	M	UNK	1	Dizziness, nausea, vomiting, petechiae, epistaxis, thrombocytopenia	9	<5%	PEX	Confirmed
1431299-1	Moderna	24	M	2	10	Right arm weakness, facial droop, tongue deviation, altered mental status, thrombocytopenia	24	<5%	PEX, steroids, rituximab	Confirmed
1238201-1	Moderna	42	F	2	62	Chills, fatigue, loss of consciousness, myalgia, fever	9	<5%	PEX, steroids, rituximab. Plan to start caplacizumab. Outcome pending	Confirmed
1280882-1	Moderna	49	F	1	8	Recurrent TTP presenting with diarrhea, malaise, foggy	16	NR	NR, episode resolved, foggy persists	Probable
1740051-1	Moderna	48	M	1	NR	Recurrent TTP with dysarthria, Hemiparesis, Parasthesia	10	<3%	PEX, steroids, rituximab.	Confirmed
1430563-1	Moderna	50	F	2	21	Decreased appetite, dyspnea, fatigue, headache. Discharge home from ER and found down at home.	NR	NR	NR, Died in hospital. Doctors suspected TTP.	Possible
1318918-1	Moderna	62	F	2	14	Stroke	<10	<5%	NR, outcome pending, permanent hemiparesis and speech deficit predicted	Confirmed
1420583-1	Moderna	63	M	2	11	Abdominal pain, AKI, dyspnea, fatigue, altered mental status	14	<5%	PEX. Hematologic parameters, renal function, and mentation have improved	Confirmed
1713660-1	Moderna	63	M	2	13	Abdominal pain, delirium, epistaxis, Fecal vomiting, Hematemesis, Headache, Malaise	NR	NR	Pt died. Dx with brain hemorrhage that led to stroke, tentative dx of TTP versus ITP due to low platelet count	Possible
1909945-1	Moderna	71	F	3	28	Aphasia, back pain, seizure, unresponsive to stimuli	17	NR	Intubated and treated with PEX and caplacizumab. Still intubated at time of documentation, but becoming more responsive to commands	Probable
1216640-1	Moderna	73	M	1	26	Stroke-like symptoms, Transient ischemic attack, Speech disorder	19K	<5%	PLEX, steroids, and rituximab. Pt recovered well	Confirmed
1214316-1	Moderna	81	Male	1	1	Confusion, weakness, fatigue, impaired speech, thrombocytopenia, schistocytes	34	NR	Plasma infusion, PEX, steroids	Probable

10176 42-1	Pfizer	19	F	1	9	TTP relapse in a patient with history of TTP, off treatment for 5 years	NR	NR	NR	Probable
12080 74-1	Pfizer	26	F	2	64	Abdominal pain, low grade fever	NR	NR	PEX	Possible
09103 16-1	Pfizer	22	M	1	4		2	NR	PEX, corticosteroids	Possible
14138 89-1	Pfizer	20	M	1	26	Chest pain, arm numbness, abdominal tingling	31	7%	PLEX, steroids, rituximab, caplacizumab.	Confirmed
12676 37-1	Pfizer	30	F	2	27		9	NR	NR. Pt alive after hospital treatment	Possible
15318 91-1	Pfizer	32	F	UNK	26	Facial and arm numbness and weakness, chest pain	8	NR	Hx of aHUS, treated with PLEX	Probable
19126 19-1	Pfizer	32	M	2	82	Headache, confusion, slurred speech, seizure, stroke	5	<5	PEX, steroids and Caplacizumab	Confirmed
10319 09-1	Pfizer	56	F	2	22	Back pain, thrombocytopenia	9	NR	PEX and steroids. Patient died	Probable
12098 25-1	Pfizer	54		2	23	NR	NR	NR	NR. Patient died. Treatment NR	Possible
12733 29-1	Pfizer	59	F	2	0	Word finding difficulty, weakness, headache, jaw pain, decreased oral intake, stroke	NR	NR	PEX	Probable
11870 08-1	Pfizer	64	F	1	0	Fatigue, malaise, pain, pyrexia, emesis, rash	12	NR	PEX, steroids, antibiotics	Possible
14300 36-1	Pfizer	61	M	1	3	Fatigue, confusion, altered mental status, decreased oral intake, Seizure, AKI	6	<3%	PEX, rituximab, RBC transfusion	Confirmed
10069 94-1	Pfizer	75	F	1	1	Possible recurrence in patient with history of TTP in 1996	NR	NR	NR. Patient died.	Possible
11371 06-1	Pfizer	71	M	2	2	Upper abdominal pain, Back pain, T aphasia	23	<5%	PEX, steroids. Complete resolution	Confirmed
12433 36-1	Pfizer	80	M	2	39	Asthenia, decreased appetite, gait disturbance, encephalopathy, lethargy, malaise	6	<2%	PEX, red cell and platelet transfusion	Confirmed
15180 10-1	Pfizer	UNK	F	UNK	UNK	Asthenia, dysarthria, Fatigue, Headaches, Hypoesthesia	NR	NR	Platelet transfusion, other details NR	Possible
15282 28-1	Pfizer	UNK	M	2	UNK	Severe fatigue, shortness of breath	22	<2%	PEX, rituximab	Confirmed
19419 18-1	Pfizer	80	M	2	UNK	Weakness, Malaise	NR	<2%	PEX, steroids, rituximab	Confirmed
15872 65-1	J&J	32	F	1	107	Placental abruption at 35 weeks attributed to TTP requiring cesarean section, thrombocytopenia	9K	NR	Platelet transfusions, PEX	Possible
13850 16-1	J&J	42	M	1	11	Malaise, bruising, MAHA, thrombocytopenia	NR	NR	PEX	Possible
12670 91-1	J&J	60	M	1	6	Contusion, fatigue, petechiae, speech problems	13	<5%	PLEX, steroids, and Rituximab	Confirmed

13347 87-1	J&J	U N K	F	1	37	Emesis, Altered mental status, acute kidney injury	29	<12%	PEX, steroids, hemodialysis, red cell transfusion.	Confirmed
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F indicates female, M indicates male, NR indicates not reported, UNK indicates unknown, J&J indicates Johnson and Johnson

United States Department of Health and Human Services (DHHS), Public Health Service (PHS), Centers for Disease Control (CDC) / Food and Drug Administration (FDA), Vaccine Adverse Event Reporting System (VAERS) 1990 - 12/17/2021, CDC WONDER On-line Database. Accessed at <http://wonder.cdc.gov/vaers.html> on Dec 28, 2021