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Supplementary file

Table S1. Characteristics of studies included in the systematic review.

Authors, reference	Type of article	Number of patients	Type of stroke
Valderrama [1]	case report	1	AIS
Oxley [2]	case series	5	AIS
Morassi [3]	case series	6	AIS (*n* = 4), HS (*n* = 2)
Tunc [4]	case series	4	AIS
Avula [5]	case series	4	AIS (*n* = 3), TIA (*n* = 1)
Oliver [6]	case report	1	AIS
Beyrouti [7]	case series	6	AIS
Al Saiegh [8]	case series	2	AIS (*n* = 1), SAH (*n* = 1)
Gunasekaran [9]	case report	1	AIS
Goldberg [10]	case report	1	AIS
Viguier [11]	case report	1	AIS
Escalard [12]	case series/ case control	10	AIS
Wang [13]	case series	5	AIS
Fara [14]	case series	3	AIS
Moshayedi [15]	case report	1	AIS
Deliwala [16]	case report	1	AIS
Sharafi-Razavi [17]	case report	1	HS
Jain [18]	retrospective cohort study (case control)	35	AIS (*n* = 26) HS (*n* = 9)
Yaghi [19]	retrospective cohort study (case control)	32	AIS
Benussi [20]	retrospective cohort study	43	AIS (*n* = 35), TIA (*n* = 5), HS (*n* = 3)
Rudilosso [21]	case report	1	AIS
Lodigiani [22]	retrospective cohort study	9	AIS
Malentacchi [23]	case report	1	AIS

Scullen [24]	retrospective cohort study/case series	2	HS + AIS (*n* = 1), AIS (*n* = 1)
Sweid [25]	retrospective cohort study/ case series	22	AIS (*n* = 17), ST (*n* = 2), HS (*n* = 3)

AIS – acute ischemic stroke; HS – haemorrhagic stroke; SAH – subarachnoid haemorrhage; ST – sinus thrombosis; TIA-transient ischemic attack.

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Table S2. Characteristics of stroke in COVID-19 patients.

Authors, reference	Age	Sex	Type of stroke	Territory	NIHSS on admission	History	Treatment	NIHSS on discharge	mRS on discharge	Outcome on discharge	D-dimer (ng/mL)	Fibrinogen (g/L)	CRP (mg/L)	PT (sec)	INR	ferritin µg/L	Platelet (count/ mm³)	WBC (count/ mm³)
Valderrama [1]	52	male	AIS	L-ICA, L-ACA, L-MCA	20	HT	IVT, MT,	NA	NA	favorable*1	>10000	2.35	11	NA	NA	588	NA	NA
	33	female	AIS	R-ICA	19	none	apixaban	13		discharged to rehabilitation	460	5.01		13.3		7	427000	7800
	37	male	AIS	L-MCA	13	none	MT, apixaban	5		discharged home	52	3.70		13.4		136	299000	9900
Oxley [2]	39	male	AIS	R-PCA	16	HL, HT	MT, aspirin	NA	NA	unfavorable*2	2230	7.39	NA	14.4	NA	1564	135000	5500
	44	male	AIS	L-MCA	23	DM	IVT, MT, hemicraniectomy, aspirin	19		unfavorable*3	13800	4.43		12.8		987	372000	9000
	49	male	AIS	R-MCA	13	mild stroke,DM	MT (stent), aspirin, clopidogrel	7		discharged to rehabilitation	1750	5.31		15.2		596	255000	4900
	64	male	AIS	Multiple lesions in both hemispheres		smoking, MI	aspirin, clopidogrel, ramipril		6	death	7744		175		1.62		78000	
	75	male	AIS	R-ACA		HT, DM	NA		6	death	NA		46		1.53		NA	
Morassi [3]	82	male	AIS	R-PCA	NA	HT, DM, TIA	aspirin, clopidogrel, enoxaparin	NA	6	death	NA	NA	181	NA		NA	NA	NA
	76	female	AIS	L-MCA		HT, DM, aortic valve replacement, stroke	aspirin, warfarin		4	unfavorable*4	1381		12				NA	
	57	male	HS	Bilateral cerebellar		HT, thrombocytosis	NA		6	death	2866		214				NA	
	57	male	HS	R-FL		none	enoxaparin		6	death	NA		21				NA	
	45	female	AIS	L-MCA	16	HT	aspirin and low dose LMWH			unfavorable*5	803		142			264 U/L		
Tunc [4]	67	female	AIS	L-MCA	5	HT	aspirin and clopidogrel	NA	NA	favourable*6	1040	NA	4	NA	NA	79 U/L	NA	NA
	72	male	AIS	L-MCA	10	HT	aspirin and low dose LMWH			unfavorable*5	644		33			132 U/L		
	77	male	AIS	VBI	2	DM	aspirin and clopidogrel			favourable*6	378		3.66			127 U/L		

Avula [5]	73	male	AIS	L-MCA	NA	HT, HL, carotid stenosis	aspirin	NA	6	death	NA	NA	262.2	19.7	NA	NA	182000	12320
	83	female	AIS	R-MCA	2	HT, HL, DM	NA		6	death	NA		NA	13.5		NA	138000	4950
	80	female	AIS	R-MCA	36	HT	NA		6	death	13966		162.4	15.2		891	380000	18890
	88	female	TIA	L-MCA	NA	HT, HL	aspirin, statin		NA	discharged to rehabilitation	3442		127	13.5		135.9	176000	7500
Oliver [6]	62	female	AIS	L-MCA	4	HT, HL, DM, TIA	IVT, aspirin	4	NA	favorable[*7]	1160	NA	192†	12.9	NA	4609.33†	409000	13200
Beyrouti [7]	64	male	AIS	VBI		none	aspirin, clopidogrel, LMWH		NA	NA	>80000	9.5	305.4	12.5	1.14	4927	305000	6750
	53	female	AIS	R-MCA, VBI		HT, DM, mitral valve replacement, AF, HF, PM	LMWH		6	death	7750	7.03	150	34.4	3.6	1853	254000	23050
	85	male	AIS	L-PCA	NA	HT, HL, AF, CAD, prostate cancer	apixaban	NA	NA	NA	16100	5.3	161.2	11.3	1.03	1027	173000	5080
	61	male	AIS	R-MCA		HT, stroke, leg ulcers	LMWH		NA	NA	27190	4.63	12.8	10.9	0.99	1167	408000	8970
	83	male	AIS	R-MCA		HT, DM, CAD, smoking and alcohol	IVT		NA	NA	19450	4.96	27.7	11.7	1.07	NA	197000	11030
	73	male	AIS	VBI		Gastric carcinoma (resected)	IVT		NA	NA	1080	NA	179.9	12.3	1.13	655	403000	7300
Al Saiegh [8]	62	female	AIS	NA	NA	NA	MT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	31	male	SAH				decompressive hemicraniectomy			discharged to rehabilitation								
Gunasekaran [9]	40	female	AIS	R-MCA	NA	none	NA	NA	NA	unfavorable[*8]	28.07†	8.60	NA	NA	NA	3079	NA	14000
Goldberg [10]	64	male	AIS	R-MCA, bilateral ACA	NA	HT, aplastic anaemia, splenectomy	NA	NA	6	death	elevated	elevated	NA	prolonged	NA	elevated	NA	elevated
Viguier [11]	66	male	AIS	L-MCA	10	none	LMWH	3	NA	favorable[*9]	2220	8.2	219	NA	NA	1096	NA	NA
Escalard [12]	59.5 (median)	male (*n* = 8/10) female (*n* = 2/10)	AIS (*n* = 10/10)	ICA (*n* = 3/10), MCA (*n* = 6/10), BA (*n* = 1/10)	22 (19-25.7)	HT (*n* = 5/10), DM (*n* = 4/10), HL (*n* = 3/10) smoking (*n* = 1/10), AF (*n* = 1/10),	IVT (*n* = 5/10), MT (*n* = 6/10)	25 (19.75–42) §	6 (*n* = 6/10)	death (*n* = 6/10), unfavorable[*10]	NA	NA	NA	NA	NA	NA	NA	NA
Wang [13]	50s	NA	AIS	L-MCA, L-ICA	27	HT, CAD, partial lung lobectomy	IVT, MT	NA	6	death	elevated	NA	elevated	prolonged	prolonged	NA	NA	NA
	60s		AIS	R-ICA	29	PE	IVT, MT	NA	6	death								
	50s		AIS	R-ICA, BA	28	MI	IVT, MT	NA	6	death								
	30s		AIS	R-ICA	10	HT, DM	IVT, MT	1	NA	favorable[*11]								
	40s		AIS	L-MCA	20	None	IVT, MT	15	NA	favorable[*12]								
Fara [14]	33	female	AIS	R-CCA, R-ICA	NA	None	aspirin, clopidogrel, apixaban	NA	NA	NA	elevated (*n* = 1/3)	NA	elevated (*n* = 3/3)	NA	NA	NA	NA	NA
	77	female	AIS	R-CCA,		HT, HL, DVT	enoxaparin											
	55	male	AIS	R-CCA, R-ICA		DM	eptifibatide, heparin											

Moshayedi [15]	80s	male	AIS	R-MCA, L-MCA, VBI	NA	STEMI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Deliwala [16]	31	female	AIS	R-MCA	NA	None	aspirin, statin	NA	NA	discharged to rehabilitation	2.72†	NA	38.09†	NA	NA	251†	NA	9.9†
Sharafi-Razavi [17]	79	male	HS	Right hemisphere + SAH + IVH	NA	NA	NA	NA	NA	NA	NA	NA	10	12	NA	NA	210000	NA
Jain [18]	NA	NA	AIS (n = 26) HS (n = 9)	NA	NA	NA	NA	NA	6 (n = 10/26 AIS), 6 (n = 5/9 HS)	death in n = 10/26 AIS and n = 5/9 HS cases	NA	NA	NA	NA		NA	NA	NA
Yaghi [19]	50s	male (n = 23/32) female (n = 9/32)	AIS (n = 32/32)	NA	19 (median)	HT	IVT, MT, aspirin	NA	NA	discharged to rehabilitation	>10000	NA	11	NA	NA	NA	NA	NA
	60s					HT, DM, HL, AF, HF, CAD	aspirin, clopidogrel		6	Death	342		31.6					
	70s					HT, DM, AF, HL, stroke	IVT, MT		6	Death	3247		72					
	70s					HT, HL	anticoagulant		6	Death	>10000		111					
	70s					HT	anticoagulant		6	Death	>10000		63.8					
	50s					HT, DM, HL	aspirin, clopidogrel		NA	discharged home	NA		NA					
	40s					HT, DM, HL	MT, aspirin		NA	discharged to rehabilitation	769		16.7					
	40s					none	anticoagulant		6	death	>10000		170					
	60s					HT, AF	anticoagulant		NA	discharged home	NA		6.9					
	50s					HT, DM, HL	anticoagulant		6	death	319		101.1					
	60s					HL	anticoagulant		NA	unfavorable[*13]	4841		214.3					
	70s					HT, AF	IVT, MT, anticoagulant		NA	unfavorable[*13]	>10000		94.4					
	60s					HT, HL	IVT, MT, anticoagulant		6	death	4102		154.4					
	40s					none	anticoagulant		6	death	>10000		141.8					
	40s					DM, HL	anticoagulant		NA	discharged to rehabilitation	>10000		38.08					
	70s					HT, HL, AF	anticoagulant		6	death	3723		76					
	40s					HT, HL, DM, CAD	aspirin		6	death	2004		17					
	60s					HT, HL, DM, CAD, AF	anticoagulant		NA	discharged to rehabilitation	226		108					
	70s					HT, HL	aspirin		NA	discharged to rehabilitation	662		60.3					
	60s					HL, DM	anticoagulant		6	death	4786		70					
	60s					HT, HL, CAD	anticoagulant		6	death	5870		248					
	60s					none	anticoagulant		6	death	3081		323.73					
	40s					HT	MT, anticoagulation		NA	unfavorable[*13]	2735		11.9					
	70s					DM	anticoagulant		6	death	2814		142.1					
	50s					none	anticoagulant		NA	unfavorable[*13]	3248		9.9					

	60s					HL	anticoagulant		NA	unfavorable*13	>10000		297						
	60s					none	anticoagulant		NA	unfavorable*13	2703		314.5						
	70s					DM, CAD	anticoagulant		NA	unfavorable*13	>10000		366.5						
	40s					HT, HL, HF	anticoagulant		NA	unfavorable*13	2087		235						
	50s					none	anticoagulant		NA	discharged to rehabilitation	6933		210.78						
	50s					none	anticoagulant		NA	unfavorable*13	>10000		284.91						
	60s					HL	anticoagulant		NA	unfavorable*13	3058		83.03						
Benussi [20]	76.9 (median)	Male (*n* = 22) female (*n* = 21)	AIS (*n* = 35/43) TIA (*n* = 5/43) HS (*n* = 3/43)	NA	10 (3–15)	HT (*n* = 26/43), DM (*n* = 10/43), CAD (*n* = 8/43), HL (*n* = 10/43), malignancy (*n* = 2/43),	IVT (*n* = 4/32) MT (*n* = 2/43) bridging (*n* = 3/43)	9 (1–19)	5 (2–6) median (IQR)	favourable*14 (*n* = 11/43) death (*n* = 15/43)	735.5 (364.3–2910.8)	4.71 (3.68–5.45)†	28.0 (4.4–71.1)	12.8 (12.2–15.6)	NA	452.5 (268–871)	276000 (197000–315000)†	8900 (6700–11700)†
Rudilosso [21]	50	male	AIS	L-PCA	NA	none	LMWH, unfractionated heparin, VCI filter	NA	NA	favorable*15	NA	NA	NA	NA	NA	NA	NA	NA
Lodigiani [22]	67	male	AIS	NA	NA	NA	IAT, MT, LMWH	NA	NA	discharged home	8608	NA	NA	NA	NA	NA	NA	NA
	67	male	AIS				aspirin		NA	discharged home	6435							
	76	female	AIS				aspirin, nadroparin		6	death	NA							
	64	male	AIS				IVT, aspirin, nadroparin		NA	discharged home	677							
	68	male	AIS				clopidogrel, nadroparin		NA	NA*16	280							
	69	male	AIS				MT, aspirin, heparin		NA	NA*16	249							
	57	male	AIS				heparin, VCI filter		NA	NA*16	6071							
	73	female	AIS				IVT, nadroparin		NA	discharged home	1158							
	75	female	AIS				nadroparin		6	death	61000							
Malentacchi [23]	81	male	AIS	Bilateral MCA	NA	prostate adenocarcinoma, CLL	anticoagulant	NA	6	death	2017	5.39	136.2	NA	1.2	NA	NA	59000†
Scullen [24]	53	male	HS + AIS	Right	NA	HT	NA	NA	NA	unfavorable*17	NA	NA	NA	NA	NA	NA	NA	NA

	65	male	AIS	temporal lobe MCA	NA			NA								
Sweid [25]	NA	NA	AIS (*n* = 17) ST (*n* = 2) HS (*n* = 3)	NA AchA aneurysm, PCOM aneurysm	13,8±8.0 (mean) NA	HT (*n* = 10/22), CHD (*n* = 3/22), DM (*n* = 2/22), AF (*n* = 3/22)	MT (*n* = 16/17) NA	NA	mRS 3-6 (*n* = 11/22), mRS 6 (*n* = 8/22)	unfavorable including death*18 (*n* = 11/22), death (*n* = 8/22)	34.974±67.543†	NA	208±379	NA	NA	NA	NA	NA

AF – atrial fibrillation; AIS – acute ischemic stroke; AChA – anterior choroidal artery; BA – basilar artery; CAD – coronary artery disease; CCA – common carotid artery; CHD- chronic heart disease (unspecified); DM – diabetes mellitus; DVT – deep venous thrombosis; HF –heart failure; HL – hyperlipidaemia, HS – haemorrhagic stroke; HT – hypertension; ICA – internal carotid artery; IVH – intraventricular haemorrhage; IVT – intravenous thrombolysis; LMWH – low molecular weight heparin; MCA – middle cerebral artery; mRS – modified Rankin score; MT – mechanical thrombectomy; NA – not available; NIHSS - National Institutes of Health Stroke Scale; PCA – posterior cerebral artery; PCoM – posterior communicating artery; PM – pacemaker; SAH – subarachnoid haemorrhage; ST – sinus thrombosis; STEMI- ST elevation myocardial infarction; TIA – transient ischemic attack; VCI – vena cava inferior filter, §-NIHSS (median; IQR) at 24h; †- unit of laboratory measurement is unclear or questionable. Laboratory values closest to admission are provided.

Specific outcomes: *1 = moderate aphasia, improved strength in the right arm, and leg, *2 = intensive care unit, intubated and sedated, with multiorgan failure, *3 = remained at stroke unit, NIHSS:23, *4 = mRS 4 on discharge, *5 = bedridden,*6 = discharged well according to authors, *7 = NIHSS 4 on discharge, *8 = poor prognosis according to authors, patient provided with comfort measures, *9 = NIHSS improved from 10 on admission to 3 by discharge, *10 = none of the patients had neurological improvement according to authors, *11 = NIHSS 1 on discharge, *12 = NIHSS improved from 20 on admission to 15 by discharge, *13 = critical condition according to authors, *14 = criteria for favorable outcome is not provided, *15 = patient recovered from the neurological deficit within 24h,*16 = patient remained hospitalized, but outcome was not specified, *17 = critical condition, *18 = mRS 3–6.

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