

Supplementary material

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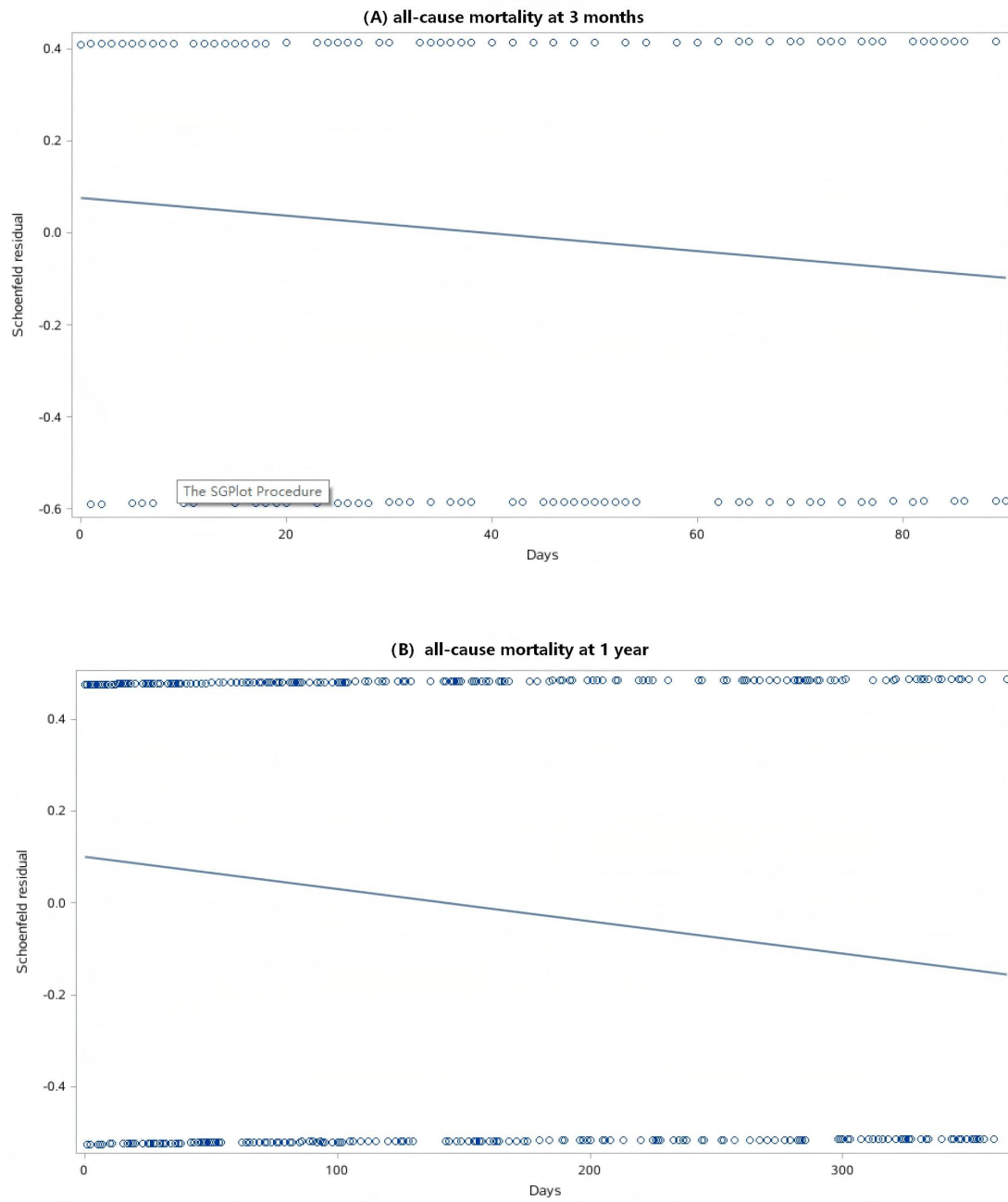
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Supplementary Figure

Figure S1 Schoenfeld residual plots for the proportional hazards assumption. (A) all-cause death at 3 months. **(B)** all-cause death at 1 year.



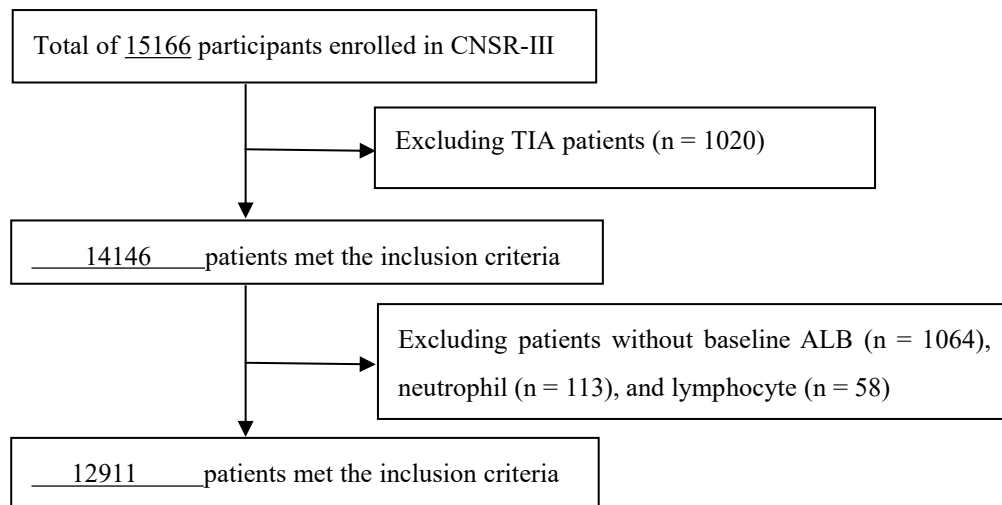
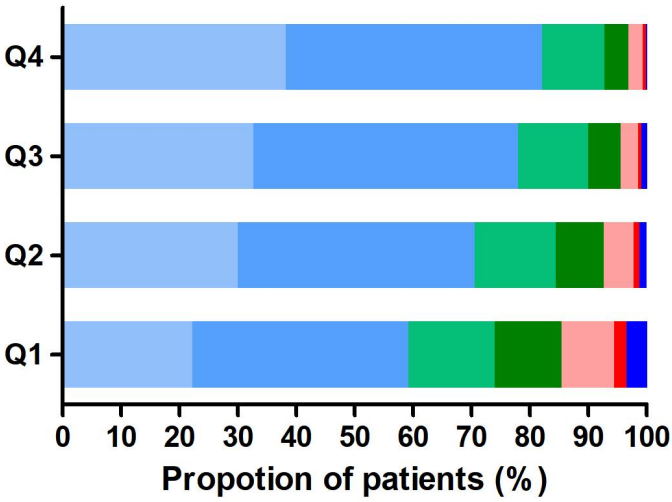


Figure S2 Flowchart. CNSR-III: the Third China National Stroke Registry-III; TIA: transient ischemic attack; ALB: albumin.

Figure S3 Distribution of mRS score at 3 months (A) and 1 year (B). mRS, modified Rankin Scale.

(A) mRS at 3 months



(B) mRS at 1 year

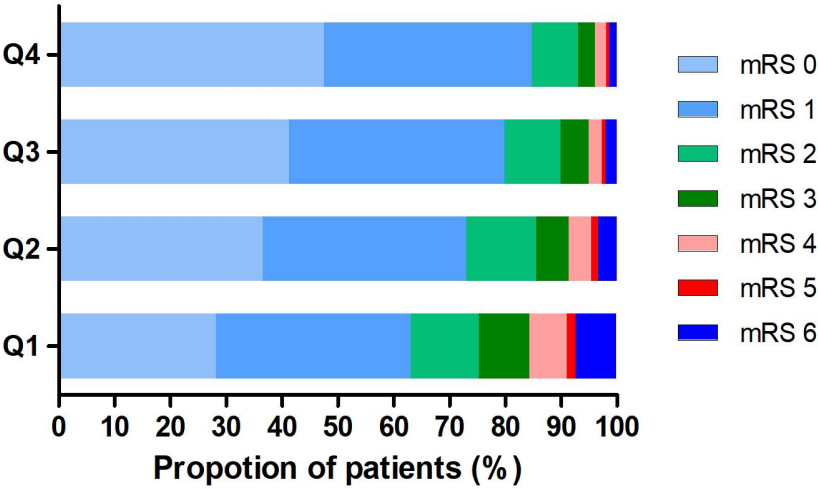
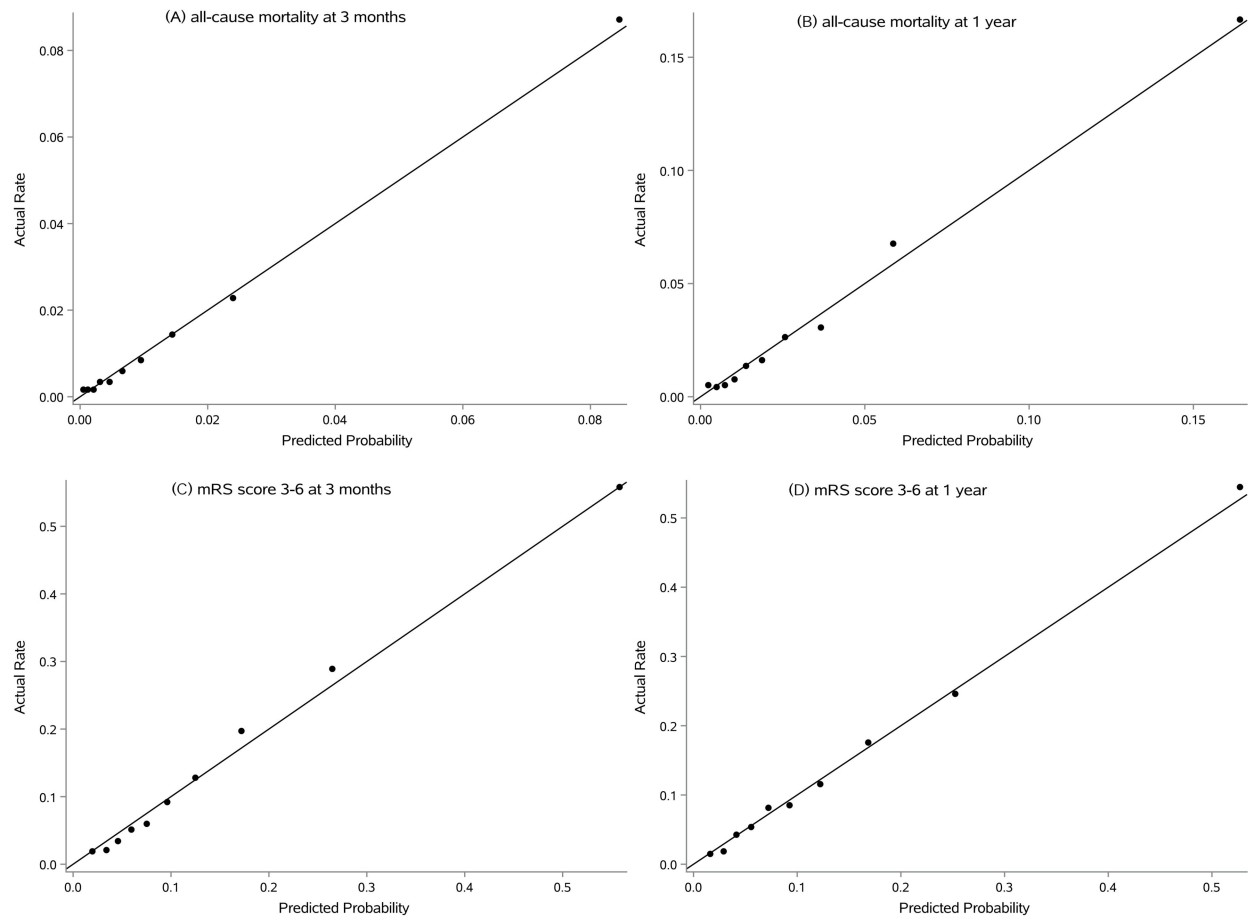


Figure S4 Calibration curves for the primary outcomes. (A) all-cause mortality at 3 months. (B) all-cause mortality at 1 year. (C) poor functional outcome at 3 months. (D) poor functional outcome at 1 year.



Supplementary Table

Table S1 Variance inflation factors for covariates in Model 2

Parameter	VIF			
	3 months follow-up		1-year follow up	
	Death	mRS 3-6	Death	mRS 3-6
Age	1.12	1.12	1.12	1.12
Male gender	1.23	1.23	1.23	1.23
NIHSS score	1.09	1.09	1.09	1.10
TOAST	1.07	1.07	1.07	1.07
classification				
Pre-stroke mRS	1.03	1.03	1.03	1.03
Hypertension	1.05	1.05	1.05	1.05
Diabetes mellitus	1.01	1.01	1.01	1.01
Atrial fibrillation	1.06	1.06	1.06	1.06
Smoking	1.10	1.10	1.10	1.10
Previous	1.03	1.03	1.03	1.03
stroke/TIA				
SBP	1.07	1.07	1.07	1.08
LDL	1.08	1.08	1.08	1.08
Intravenous	1.25	1.25	1.25	1.25
thrombolysis				

Abbreviations: VIF, variance inflation factor; mRS, modified Rankin Scale; NIHSS, National Institute of Health Stroke Scale; TOAST, the Trail of Org 10172 in Acute Stroke Treatment; TIA, transient ischemic attack; SBP, systolic blood pressure; LDL, low-density lipoprotein.

Table S2 Baseline characteristics of included versus excluded AIS patients

Variables	Total (N = 14146)	Exclude (N = 1235)	Include (N = 12911)	<i>p</i>	ASD/HL estimator
Age, years, median (IQR)	63.0 (54.0–70.0)	62.0 (54.0–70.0)	63.0 (54.0–70.0)	0.6095	0.0
Male, n (%)	9720 (68.7)	878 (71.1)	8842 (68.5)	0.0589	5.7
BMI, kg/m ² , median (IQR)	24.5 (22.6–26.6)	24.7 (22.9–26.7)	24.5 (22.6–26.5)	0.0117	0.2
Smoking status, n (%)	4503 (31.8)	396 (32.1)	4107 (31.8)	0.8544	0.6
Alcohol consumption, n (%)	2010 (14.2)	156 (12.6)	1854 (14.4)	0.0965	5.3
Baseline NIHSS, median (IQR)	3.0 (2.0–6.0)	4.0 (2.0–6.0)	3.0 (2.0–6.0)	0.0038	0.0
Pre-stroke mRS 2-5, n (%)	1308 (9.2)	116 (9.4)	1192 (9.2)	0.8526	0.7
TOAST types, n (%)				0.4843	
LAA	3667 (25.9)	325 (26.3)	3342 (25.9)		0.9
CE	881 (6.2)	67 (5.4)	814 (6.3)		3.8
SAO	3137 (22.2)	274 (22.2)	2863 (22.2)		0.0
SOE	171 (1.2)	10 (0.8)	161 (1.2)		4.0
SUE	6290 (44.5)	559 (45.3)	5731 (44.4)		1.8
Medical history, n (%)					
Atrial fibrillation	986 (7.0)	76 (6.2)	910 (7.0)	0.2383	3.2
Prior Stroke/TIA	3134 (22.2)	252 (20.4)	2882 (22.3)	0.1212	4.6
Hypertension	8887 (62.8)	789 (63.9)	8098 (62.7)	0.4184	2.5
Diabetes mellitus	3310 (23.4)	312 (25.3)	2998 (23.2)	0.1053	4.9
Dyslipidemia	1075 (7.6)	101 (8.2)	974 (7.5)	0.4217	2.6
SBP, mmHg, median (IQR)	149.0 (135.0–164.0)	149.0 (136.5–164.0)	149.0 (135.0–164.0)	0.8916	0.0
Laboratory data, median (IQR)					
LDL, mmol/L	2.4 (1.8–3.1)	2.4 (1.8–3.0)	2.4 (1.8–3.1)	0.0011	-0.1
HDL, mmol/L	1.1 (0.9–1.3)	1.0 (0.8–1.2)	1.1 (0.9–1.3)	<.0001	-0.1
ALT, U/L	18.0 (13.0–25.8)	19.9 (14.0–29.0)	18.0 (13.0–25.3)	0.0013	1.5

ALB, g/L	40.4 (37.9–43.0)	40.9 (38.0–43.0)	40.4 (37.9–43.0)	0.5363	0.2
WBC, 109/L	6.9 (5.7–8.5)	7.1 (6.0–8.7)	6.9 (5.7–8.4)	0.0004	0.2
Hemoglobin, g/L	141.0 (130.0–152.0)	143.0 (133.0–154.0)	141.0 (130.0–151.3)	<.0001	2.0
Platelet, 109/L	211.0 (175.0–253.0)	217.0 (179.0–255.0)	211.0 (175.0–253.0)	0.0370	4.0
Neutrophil, 109/L	4.5 (3.5–5.8)	4.7 (3.7–5.9)	4.5 (3.5–5.8)	<.0001	0.2
Lymphocyte, 109/L	1.7 (1.3–2.2)	1.7 (1.3–2.2)	1.7 (1.3–2.2)	0.5668	0.0
Uric acid, μ mol/L	297.0 (242.0–360.0)	294.5 (238.0–361.0)	297.0 (243.0–359.5)	0.5681	-2.0
Serum creatinine, μ mol/L	69.0 (58.0–82.0)	70.0 (59.0–82.0)	69.0 (58.0–82.0)	0.1641	1.0
NLR	2.6 (1.9–3.8)	5.2 (4.2–7.3)	3.0 (2.7–3.5)	<.0001	
ALI	38.5 (25.5–54.7)	18.0 (12.7–22.0)	31.9 (28.8–35.1)	<.0001	
Inpatient medication, n (%)					
Antihypertensive	6576 (46.5)	623 (50.4)	5953 (46.1)	0.0035	8.6
treatment					
Antiplatelet therapy	13648 (96.5)	1192 (96.5)	12456 (96.5)	0.9385	0.0
Anticoagulation treatment	1481 (10.5)	134 (10.9)	1347 (10.4)	0.6473	1.6
lipid-lowering treatment	13579 (96.0)	1184 (95.9)	12395 (96.0)	0.8200	0.5
Hypoglycemic treatment	3598 (25.4)	352 (28.5)	3246 (25.1)	0.0096	7.7
Acute recanalization therapy,					
n (%)					
Intravenous thrombolysis	1520 (10.7)	168 (13.6)	1352 (10.5)	0.0007	9.5
Endovascular treatment	92 (0.7)	6 (0.5)	86 (0.7)	0.4515	2.6
Follow-up in 3 months, n					
n (%)					
All-cause mortality	217 (1.5)	26 (2.1)	191 (1.5)	0.0873	4.5
mRS score 3-6	2052 (14.5)	175 (14.2)	1877 (14.5)	0.9382	0.9
CVE	956 (6.8)	79 (6.4)	877 (6.8)	0.5965	1.6
Stroke recurrence	924 (6.5)	75 (6.1)	849 (6.6)	0.4944	2.1
Follow-up in 1 year, n (%)					
All-cause mortality	486 (3.4)	45 (3.6)	441 (3.4)	0.6742	1.1

mRS score 3-6	1947 (13.8)	181 (14.7)	1766 (13.7)	0.6067	2.9
CVE	1505 (10.6)	125 (10.1)	1380 (10.7)	0.5369	2.0
Stroke recurrence	1424 (10.1)	118 (9.6)	1306 (10.1)	0.5315	1.7

Abbreviations: AIS, acute ischemic stroke; ASD, absolute standardized difference; IQR, interquartile range; BMI, body mass index; NIHSS, National Institute of Health Stroke Scale; mRS, modified Rankin scale; TOAST, the Trail of Org 10172 in Acute Stroke Treatment; LAA, large artery atherosclerosis; CE, cardioembolism; SAO, small artery occlusion; SOE, stroke of other determined etiology; SUE, stroke of undetermined etiology; TIA, transient ischemic attack; SBP, systolic blood pressure; LDL, low-density lipoprotein; HDL, high-density lipoprotein; ALT, alanine aminotransferase; ALB, albumin; WBC, white blood cell; NLR, neutrophil-to-lymphocyte ratio; ALI, advanced lung cancer inflammation index; CVE, combined vascular events.

Table S3 Sensitivity analysis: comparison of results between the parsimonious model and the original comprehensive model

Outcomes	Model 2 (13 covariates)		Original Model (28 covariates)	
	HR/OR (95% CI)	P	HR/OR (95% CI)	P
3-month				
All-cause mortality	0.61 (0.52, 0.72)	<.0001	0.62 (0.52, 0.73)	<.0001
Poor functional outcome	0.73 (0.69, 0.77)	<.0001	0.73 (0.69, 0.77)	<.0001
Stroke recurrence	0.87 (0.82, 0.93)	<.0001	0.87 (0.81, 0.93)	<.0001
CVE	0.87 (0.82, 0.93)	<.0001	0.87 (0.81, 0.93)	<.0001
1 year				
All-cause mortality	0.68 (0.61, 0.75)	<.0001	0.69 (0.62, 0.77)	<.0001
Poor functional outcome	0.76 (0.72, 0.80)	<.0001	0.76 (0.72, 0.81)	<.0001
Stroke recurrence	0.89 (0.85, 0.94)	<.0001	0.89 (0.85, 0.94)	<.0001
CVE	0.89 (0.85, 0.94)	<.0001	0.89 (0.85, 0.94)	<.0001

Note: ALI was modeled as a continuous variable (per IQR increase).

Model 2 adjusted for: age, sex, smoking, admission NIHSS score, pre-stroke mRS score, TOAST classification, diabetes mellitus, hypertension, atrial fibrillation, prior stroke or TIA, SBP, LDL, and intravenous thrombolysis.

Original model adjusted for: age, sex, smoking, alcohol consumption, admission NIHSS score, pre-stroke mRS score, TOAST classification, medical history (dyslipidemia, diabetes mellitus, hypertension, atrial fibrillation, and prior stroke or TIA), SBP, in-hospital therapies including intravenous thrombolysis, endovascular procedures, antiplatelet agents, lipid-lowering medications, anticoagulants, hypoglycemic treatments, and antihypertensive drugs, and laboratory tests (LDL, HDL, ALT, WBC, hemoglobin, platelets, uric acid, and serum creatinine).

Abbreviations: HR, hazard ratio; OR, odds ratio; CI, confidence interval; CVE, combined vascular events; ALI, advanced lung cancer inflammation index; IQR, interquartile range; NIHSS, National Institute of Health Stroke Scale; mRS, modified Rankin scale; TOAST, the Trail of Org 10172 in Acute Stroke Treatment; TIA, transient ischemic attack; SBP, systolic blood pressure; LDL, low-density lipoprotein; HDL, high-density lipoprotein; ALT, alanine aminotransferase; WBC, white blood cell.

Table S4 Sensitivity analysis: comparison of primary analysis and median imputation analysis

Outcomes	Primary analysis		Median imputation	
	HR/OR (95% CI)	P	HR/OR (95% CI)	P
3-month				
All-cause mortality	0.61 (0.52, 0.72)	<.0001	0.63 (0.54, 0.75)	<.0001
Poor functional outcome	0.73 (0.69, 0.77)	<.0001	0.74 (0.70, 0.78)	<.0001
Stroke recurrence	0.87 (0.82, 0.93)	<.0001	0.88 (0.83, 0.94)	0.0001
CVE	0.87 (0.82, 0.93)	<.0001	0.88 (0.83, 0.94)	0.0001
1-year				
All-cause mortality	0.68 (0.61, 0.75)	<.0001	0.69 (0.62, 0.76)	<.0001
Poor functional outcome	0.76 (0.72, 0.80)	<.0001	0.76 (0.72, 0.81)	<.0001
Stroke recurrence	0.89 (0.85, 0.94)	<.0001	0.90 (0.86, 0.95)	<.0001
CVE	0.89 (0.85, 0.94)	<.0001	0.90 (0.86, 0.95)	<.0001

Note: ALI was modeled as a continuous variable (per IQR increase). Both analyses adjusted for Model 2 covariates (age, sex, smoking, admission NIHSS score, pre-stroke mRS score, TOAST classification, diabetes mellitus, hypertension, atrial fibrillation, prior stroke or TIA, SBP, LDL, and intravenous thrombolysis). In the median imputation analysis, missing continuous covariates were imputed using the median value of the respective variable.

Abbreviations: HR, hazard ratio; OR, odds ratio; CI, confidence interval; CVE, combined vascular events; ALI, advanced lung cancer inflammation index; IQR, interquartile range; NIHSS, National Institute of Health Stroke Scale; mRS, modified Rankin scale; TOAST, the Trail of Org 10172 in Acute Stroke Treatment; TIA, transient ischemic attack; SBP, systolic blood pressure; LDL, low-density lipoprotein.

Table S5 Predictive values of ALI for adverse outcomes

Outcomes	AUC (95% CI)	Cutoff	Sensitivity (%)	Specificity (%)	Youden index
3 months follow-up					
Death	0.736 (0.699, 0.773)	24.3	58.1	77.7	0.36
mRS 3–6	0.666 (0.653, 0.680)	32.77	60.5	64.5	0.25
Stroke recurrence	0.563 (0.543, 0.584)	26.57	36.5	73.9	0.10
CVE	0.565 (0.545, 0.585)	26.57	36.7	73.9	0.11
1-year follow-up					
Death	0.700 (0.674, 0.725)	35.83	73.5	55.8	0.29
mRS 3–6	0.664 (0.650, 0.678)	31.23	57.4	67.5	0.25
Stroke recurrence	0.553 (0.536, 0.569)	35.09	51.3	57.1	0.08
CVE	0.555 (0.539, 0.572)	33.22	47.9	60.7	0.09

Abbreviations: ALI, advanced lung cancer inflammation index; AUC, area under the curve; mRS, modified Rankin Scale; CVE, combined vascular events.

Table S6 Comparison of predictive performances of ALI, ALB, NLR, and BMI in predicting all-cause mortality and poor functional outcome

Outcome	AUC (95% CI)	P	Outcome	AUC (95% CI)	P
3 months (Death)			1-year (Death)		
ALI	0.736 (0.699, 0.773)	Ref.	ALI	0.700 (0.674, 0.725)	Ref.
NLR	0.707 (0.668, 0.746)	<.0001	NLR	0.673 (0.646, 0.699)	<.0001
Albumin	0.657 (0.616, 0.698)	0.0015	Albumin	0.635 (0.607, 0.663)	0.0001
BMI	0.598 (0.554, 0.641)	<.0001	BMI	0.585 (0.557, 0.614)	<.0001
3 months (mRS 3–6)			1 year (mRS 3–6)		
ALI	0.666 (0.653, 0.680)	Ref.	ALI	0.664 (0.650, 0.678)	Ref.
NLR	0.657 (0.644, 0.671)	<.0001	NLR	0.648 (0.634, 0.662)	<.0001
Albumin	0.559 (0.545, 0.574)	<.0001	Albumin	0.590 (0.576, 0.605)	<.0001
BMI	0.543 (0.528, 0.558)	<.0001	BMI	0.549 (0.534, 0.564)	<.0001

Abbreviations: ALI, advanced lung cancer inflammation index; ALB, albumin; NLR, neutrophil-to-lymphocyte ratio; BMI, body mass index; AUC, area under the curve; mRS, modified Rankin scale.