

Supplementary Table S1 The predictive performance of RAR on all-cause mortality

Variables	Cut-off	Sensitivity	Specificity	PPV	NPV	AUC (95%CI)
RAR	3.90	0.635	0.636	0.505	0.748	0.671 (0.63, 0.709)
SOFA	1.50	0.450	0.736	0.500	0.695	0.611 (0.572, 0.650)
SAPS II	34.50	0.732	0.635	0.540	0.802	0.736 (0.702, 0.770)
RAR+SOFA+SAPS II		0.815	0.618	0.555	0.850	0.767 (0.734, 0.799)

Abbreviations: RAR, red blood cell distribution width to albumin ratio; SOFA, sequential organ failure assessment; SAPS II, simplified acute physiology score II; PPV, positive predictive value; NPV, negative predictive value; AUC, area under the curve.

Supplementary Table S2 Description of missing data

Variables	Non-missing	Missing (%)
Age	817	0
Gender	817	0
Weight	810	7 (0.86%)
Hypertension	817	0
MI	817	0
CHF	817	0
COPD	817	0
Diabetes	817	0
PVD	817	0
Liver disease	817	0
Renal disease	817	0
Malignancy	817	0
RBC	817	0
Platelets	817	0
WBC	814	3 (0.37%)
ALT	758	59 (7.22%)
AST	809	8 (0.98%)
ALP	805	12 (0.15%)
Anion gap	815	2 (0.24%)
Bicarbonate	817	0
BUN	812	5 (0.61%)
Calcium	756	61 (7.47%)
Creatinine	817	0

Variables	Non-missing	Missing (%)
Glucose	815	2 (0.24%)
Sodium	817	0
Potassium	817	0
INR	783	34 (4.16%)
APTT	813	4 (0.49%)
SBP	817	0
DBP	817	0
Heart rate	817	0
Resp rate	816	1 (0.12%)
SPO2	814	3 (0.37%)
Temperature	817	0
Noerpinephrine	817	0
Vasopressin	817	0
Ventilation	817	0
SOFA	817	0
SAPSI	817	0
GCS	817	0
CCI	817	0
30-Day-mortality	817	0
90-Day-mortality	817	0
365-Day-mortality	817	0

Abbreviations: RAR, red blood cell distribution width-to-albumin ratio; MI, myocardial infarction; CHF, congestive heart failure; COPD, chronic obstructive pulmonary disease; PVD, peripheral vascular_disease; RBC, red blood cell; WBC, white blood cell; ALT, alanine aminotransferase; AST, aspartate aminotransferase; ALP, alkaline phosphatase; BUN, blood urea nitrogen; INR, international normalized ratio; GCS, Glasgow coma scale; SOFA, sequential organ failure assessment; SAPS II, simplified acute physiology score II; CCI, Charlson comorbidity index; SBP, systolic blood pressure; DBP, diastolic blood pressure; SpO2, saturation of pulse oxygen.

Supplementary Table S3 Relationship between RAR and mortality among sICH patients after excluding participants with incomplete data of covariates

RAR	Model I		Model II		Model III	
	HR (95%CI)	<i>P</i>	HR (95%CI)	<i>P</i>	HR (95%CI)	<i>P</i>
30-D mortality						
RAR	1.28 (1.17,1.40)	<0.001	1.29 (1.18,1.42)	<0.001	1.35 (1.10,1.52)	<0.001
≤3.90	Ref		Ref		Ref	
>3.90	2.22 (1.66, 2.96)	<0.001	2.22 (1.66, 2.96)	<0.001	2.27 (1.51, 2.41)	<0.001
90-D mortality						
RAR	1.32 (1.22,1.43)	<0.001	1.34 (1.23,1.45)	<0.001	1.35 (1.15,1.58)	<0.001
≤3.90	Ref		Ref		Ref	
>3.90	2.41 (1.85, 3.15)	<0.001	2.41 (1.85, 3.15)	<0.001	2.22 (1.54, 3.20)	<0.001
365-D mortality						
RAR	1.33 (1.23,1.43)	<0.001	1.34 (1.25,1.45)	<0.001	1.37 (1.19,1.59)	<0.001
≤3.90	Ref		Ref		Ref	
>3.90	2.31 (1.81, 2.95)	<0.001	2.31(1.81, 2.95)	<0.001	2.17 (1.56, 3.01)	<0.001

Model I: Unadjusted.

Model II: Adjusted for gender,age,weight.

Model III: Adjusted for gender, age, weight, GCS, SOFA, SAPSII, CCI, Primary hypertension, MI, CHF, COPD, PVD, Diabetes, Severe liver disease, Renal disease, Malignancy, RBC, WBC, PLT, ALT, AST, ALP, sodium, potassium, calcium, glucose, anion gap, bicarbonate, BUN, creatinine, INR, APTT, SBP, DBP, heart rate, resp rate, SPO2, temperature, noerpinephrine, vasopressin, ventilation.

Supplementary Table S4 Sensitivity analysis of RAR predictive performance for 30-day mortality: comparison between 90-day-optimized threshold (3.9) and 30-day-optimized threshold (3.94).

Variables	Model Using 90-Day-Optimized Threshold (3.90)	Model Using 30-Day-Optimized Threshold (3.94)
HR (95%CI)	1.35 (1.10,1.52)	1.28 (1.12,1.48)
<i>P</i>	<0.001	<0.001
AUC	0.671	0.638
Sensitivity	0.635	0.613
Specificity	0.636	0.622

Abbreviations: HR, Hazard Ratio; CI, Confidence Interval; AUC, area under the curve.

Supplementary Table S5 After excluding participants with severe malnutrition (albumin < 25 g/L), association between RAR and survival

RAR	Model I		Model II		Model III	
	HR (95%CI)	<i>P</i>	HR (95%CI)	<i>P</i>	HR (95%CI)	<i>P</i>
30-D mortality	1.35 (1.20,1.52)	<0.001	1.37 (1.21,1.56)	<0.001	1.30 (1.07,1.58)	0.009
90-D mortality	1.43 (1.29,1.60)	<0.001	1.47 (1.31,1.64)	<0.001	1.39 (1.16,1.66)	<0.001
365-D mortality	1.40 (1.26,1.55)	<0.001	1.43 (1.28,1.59)	<0.001	1.29 (1.09,1.52)	0.003

Model I: Unadjusted.

Model II: Adjusted for gender,age,weight.

Model III: Adjusted for gender, age, weight, GCS, SOFA, SAPS II, CCI, Primary hypertension, MI, CHF, COPD, PVD, Diabetes, Severe liver disease, Renal disease, Malignancy, RBC, WBC, PLT, ALT, AST, ALP, sodium, potassium, calcium, glucose, anion gap, bicarbonate, BUN, creatinine, INR, APTT, SBP, DBP, heart rate, resp rate, SPO2, temperature, noerpinephrine, vasopressin, ventilation.

Supplementary Table S6 After excluding participants with baseline heart disease and cancer, association between RAR and survival

RAR	Model I		Model II		Model III	
	HR (95%CI)	<i>P</i>	HR (95%CI)	<i>P</i>	HR (95%CI)	<i>P</i>
30-D mortality	1.42 (1.28,1.60)	<0.001	1.47 (1.32,1.65)	<0.001	1.56 (1.26,1.93)	<0.001
90-D mortality	1.49 (1.34,1.64)	<0.001	1.53 (1.38,1.70)	<0.001	1.60 (1.32,1.95)	<0.001
365-D mortality	1.47 (1.33,1.62)	<0.001	1.45 (1.27,1.65)	<0.001	1.61 (1.27,2.05)	<0.001

Model I: Unadjusted.

Model II: Adjusted for gender,age,weight.

Model III: Adjusted for gender, age, weight, GCS, SOFA, SAPSII, CCI, Primary hypertension, COPD, PVD, Diabetes, Severe liver disease, Renal disease,, RBC, WBC, PLT, ALT, AST, ALP, sodium, potassium, calcium, glucose, anion gap, bicarbonate, BUN, creatinine, INR, APTT, SBP, DBP, heart rate, resp rate, SPO₂, temperature, noerpinephrine, vasopressin, ventilation.

Supplementary Table S7 Association between RAR and survival outcomes following exclusion of potential mediators, including mechanical ventilation and vasopressor administration

RAR	Model I		Model II		Model III	
	HR (95%CI)	P	HR (95%CI)	P	HR (95%CI)	P
30-D mortality	1.27 (1.18,1.38)	<0.001	1.30 (1.20,1.41)	<0.001	1.29 (1.12,1.47)	<0.001
90-D mortality	1.33 (1.24,1.43)	<0.001	1.35 (1.26,1.46)	<0.001	1.31 (1.16,1.48)	<0.001
365-D mortality	1.33 (1.24,1.42)	<0.001	1.35 (1.26,1.45)	<0.001	1.27 (1.24,1.42)	<0.001

Model I: Unadjusted.

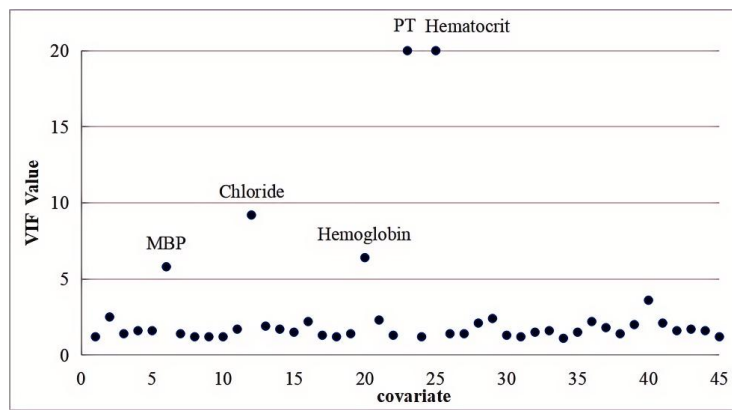
Model II: Adjusted for gender,age,weight.

Model III: Adjusted for gender, age, weight, GCS, SOFA, SAPS II, CCI, Primary hypertension, MI, CHF, COPD, PVD, Diabetes, Severe liver disease, Renal disease, Malignancy, RBC, WBC, PLT, ALT, AST, ALP, sodium, potassium, calcium, glucose, anion gap, bicarbonate, BUN, creatinine, INR, APTT, SBP, DBP, heart rate, resp rate, SPO2, temperature.

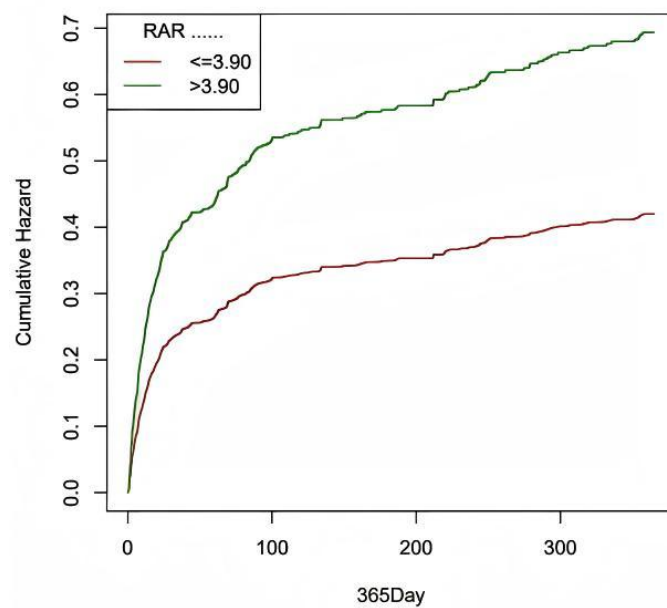
Supplementary Table S8 Relationship between RAR and mortality among sICH patients in the Crude Analysis, Multivariable Analysis, and Propensity-score Analyses

Analysis	30-D mortality	90-D mortality	365-D mortality
Number of events (%)	248 (30.35%)	302 (36.96%)	358 (43.82%)
Crude-HR (95%CI)	1.27 (1.18, 1.38)	1.33 (1.24, 1.43)	1.33 (1.24, 1.42)
Multivariable-HR (95%CI)	1.28 (1.12, 1.48)	1.31 (1.16, 1.48)	1.27 (1.13, 1.42)
Propensity-score-HR (95%CI)			
PSM	1.23 (1.02, 1.49)	1.33 (1.13, 1.57)	1.36 (1.17, 1.59)
IPTW	1.38 (1.34, 1.42)	1.37 (1.33, 1.41)	1.38 (1.34, 1.42)

Abbreviations: HR, Hazard Ratio; CI, Confidence Interval; PSM, Propensity Score Matching; IPTW, Inverse Probability of Treatment Weighting.



Supplementary Fig. S1 VIF plot for multicollinearity checking.



Supplementary Fig. S2 Cumulative hazard plot verifying proportional hazards assumption. Curves are stratified by RAR cutoff and adjusted for confounders.