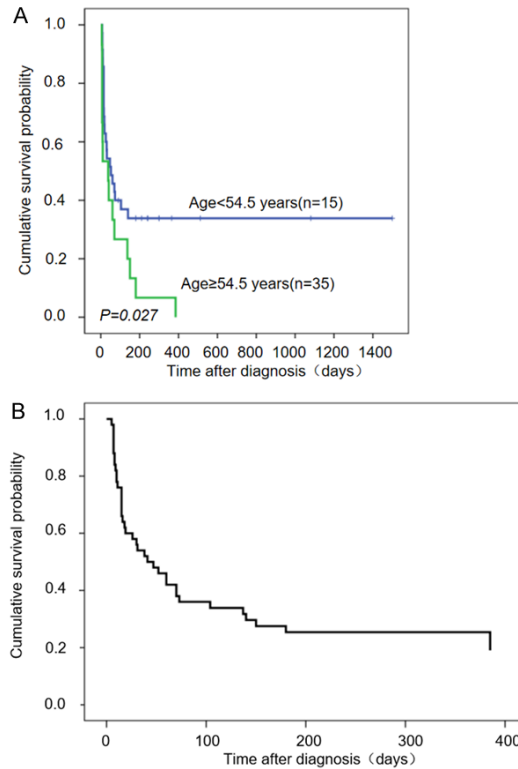


## Risk factors for death in patients with sHLH

**Supplementary Table 1.** The Cutoff-value and the difference between two sides of Age, Temperature, WBC, HGB and PLT between survivors and non-survivors

Parameters	Cutoff-value	P-value	95% Confidence Interval
Age (years)	54.5	<0.0001	12.23-30.900
Temperature (°C)	39.15	0.0028	1.268-2.138
WBC ( $\times 10^9/L$ )	2.515	0.0002	2.293-6.891
HG (g/L)	115	<0.0001	97.660-156.500
PLT ( $\times 10^9/L$ )	1.505	<0.0001	1.486-3.695

Abbreviations: WBC: White blood cell; PLT: Platelet; HGB: Hemoglobin.



**Supplementary Figure 1.** Overall survival function and age Kaplan-Meier survival curve. Kaplan-Meier curve of patients Overall survival (OS) with (A) Age <54.5 years or ≥54.5 years (n = 15). (B) The cumulative survival probability function of HLH patients.

## Risk factors for death in patients with sHLH

**Supplementary Table 2.** The Cutoff-value and the difference between two sides of cytokines in the survival time of HLH patients between 1-10 days and >10 days

Parameters (pg/mL)	Cutoff-value	P-value	95% Confidence Interval
IL-1 $\beta$	2.835	0.0592	-
IL-2	3.35	0.0351	6.986-181.200
IL-4	4.035	<0.0001	2.680-4.767
IL-5	2.495	<0.0001	1.266-2.336
IL-6	58.39	0.0009	103.500-366.800
IL-8	17.335	0.0608	-
IL-10	944.35	<0.0001	1225.000-1626.000
IL-12P70	6.855	<0.0001	5.259-9.709
IL-17A	1.93	0.0002	1.358-3.751
IL-17F	2.845	0.0009	1.744-5.765
IL-22	0.87	0.2337	-
IL- $\gamma$	3.895	0.1066	-
TNF- $\alpha$	4.43	0.0005	10.910-33.150
TNF- $\beta$	2.895	0.0427	0.1186-6.483

**Supplementary Table 3.** The Cutoff-value and the difference between two sides of cytokines in the survival time of HLH patients between 1-30 days and >30 days

Parameters (pg/mL)	Cutoff-value	P-value	95% Confidence Interval
IL-1 $\beta$	2.05	0.2944	-
IL-2	2.38	0.1166	-
IL-4	3.315	<0.0001	2.665-4.416
IL-5	1.245	0.0009	0.527-1.758
IL-6	58.39	0.0009	103.500-366.800
IL-8	18.005	0.0608	-
IL-10	16.73	0.0321	28.360-595.500
IL-12P70	5.685	<0.0001	4.477-8.601
IL-17A	1.93	0.0002	1.358-3.751
IL-17F	2.89	0.0005	1.954-6.032
IL-22	1.685	0.0106	2.090-14.090
IL- $\gamma$	1.655	0.4672	-
IL- $\alpha$	1.265	0.1796	-
TNF- $\beta$	4.04	<0.0001	5.613-14.240

## Risk factors for death in patients with sHLH

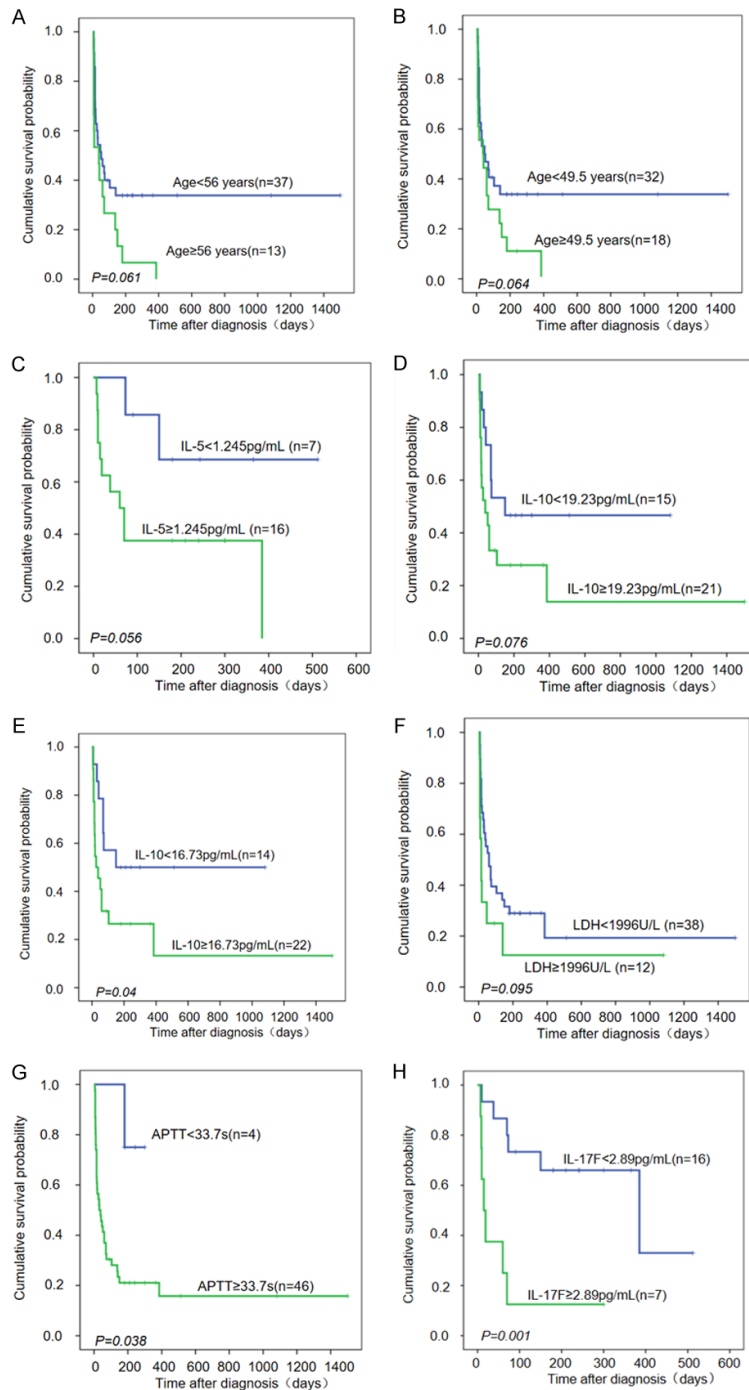
**Supplementary Table 4.** The Cutoff-value and the difference between two sides of cytokines in the survival time of HLH patients between 1-60 days and >60 days

Parameters (pg/mL)	Cutoff-value	P-value	95% Confidence Interval
IL-1 $\beta$	2.05	0.2944	-
IL-2	2.375	0.1166	-
IL-4	2.675	<0.0001	2.593-4.342
IL-5	1.245	0.0009	0.5273-1.758
IL-6	58.39	0.0009	103.5-366.800
IL-8	58.39	0.0008	90.090-311.700
IL-10	16.725	0.0321	28.36-595.500
IL-12P70	5.685	<0.0001	4.477-8.601
IL-17A	1.93	0.0002	1.358-3.751
IL-17F	2.89	0.0005	1.954-6.032
IL-22	1.34	0.0889	-
IL- $\gamma$	2.895	0.2017	-
TNF- $\alpha$	3.08	0.0302	1.307-23.500
TNF- $\beta$	4.04	0.0071	1.598-9.037

**Supplementary Table 5.** The Cutoff-value and the difference between two sides of cytokines in the survival time of HLH patients between 1-90 days and >90 days

Parameters (pg/mL)	Cutoff-value	P-value	95% Confidence Interval
IL-1 $\beta$	2.835	0.0592	-
IL-2	3.35	0.0351	6.986-181.200
IL-4	3.315	<0.0001	2.665-4.416
IL-5	1.105	0.0017	0.485-1.812
IL-6	38.68	0.0024	82.410-349.200
IL-8	18.005	0.0608	-
IL-10	16.73	0.0321	28.360-595.500
IL-12P70	6.855	<0.0001	5.259-9.709
IL-17A	2.45	<0.0001	2.009-4.123
IL-17F	2.835	0.0009	1.744-5.765
IL-22	1.685	0.0106	2.090-14.090
IL- $\gamma$	2.895	0.2017	-
TNF- $\alpha$	3.08	0.0302	1.307-23.500
TNF- $\beta$	4.04	0.0071	1.598-9.037

## Risk factors for death in patients with sHLH



**Supplementary Figure 2.** Age, APTT, LDH, IL-5 and IL-10 Kaplan-Meier survival curve. A. Kaplan-Meier survival curve of patients with Death within 30 days and 60 days of age  $\ge 56$  years-old or age  $< 56$  years-old. B. Kaplan-Meier survival curve of patients with Death within 30 days and 60 days of age  $\ge 49.5$  years-old or age  $< 49.5$  years-old. C. Kaplan-Meier survival curve of patients with Death within 10 days, 30 days, 60 days, 90 days and non-survivors of IL-5  $\ge 1.245$  pg/mL or IL-5  $< 1.245$  pg/mL on both sides. D. Kaplan-Meier survival curve of patients with Death within 10 days of IL-10  $\ge 19.23$  pg/mL or IL-10  $< 19.23$  pg/mL. E. Kaplan-Meier survival curve of patients with Death within 30 days, 60 days and non-survivors of IL-10  $\ge 16.73$  pg/mL or IL-10  $< 16.73$  pg/mL. F. Kaplan-Meier survival curve of patients with Death within 60 days and 90 days of LDH  $\ge 1996$  U/L or LDH  $< 1996$  U/L. G. Kaplan-Meier survival curve of patients with Death within non-survivors of APTT  $\ge 33.7$  s or APTT  $< 33.7$  s. H. Kaplan-Meier survival curve of patients with Death within 10 days, 30 days, 60 days, 90 days non-survivors of IL-17F  $\ge 2.89$  pg/mL or IL-17F  $< 2.89$  pg/mL.

## Risk factors for death in patients with sHLH

**Supplementary Table 6.** Age, PLT, APTT, TRIG, LDH, IL-5, IL-10, IL-17F multi-factor analysis

Duration of survival	Parameters	Adverse factor	P-value	Hazard ratio
Survivors and non-survivors	Age (years)	54.5	0.055	4.286
	IL-10 (pg/mL)	16.73	0.05	4.762
	IL-17F (pg/mL)	2.89	0.025	9.044
	PLT ( $\times 10^9/L$ )	115	0.873	1.129
	LDH (U/L)	-	-	-
	IL-5 (pg/mL)	1.245	0.669	0.636
	APTT (s)	33.7	0.983	>100
1-10 days and >10 days	Age (years)	56	0.016	8.452
	IL-10 (pg/mL)	19.23	0.582	1.557
	IL-17F (pg/mL)	2.89	0.021	8.002
	PLT ( $\times 10^9/L$ )	-	-	-
	LDH (U/L)	1996	0.484	2.429
	IL-5 (pg/mL)	1.245	0.589	1.557
	APTT (s)	41.75	0.315	2.117
1-30 days and >30 days	Age (years)	56	0.021	8.098
	IL-10 (pg/mL)	16.73	0.640	1.458
	IL-17F (pg/mL)	2.89	0.009	12.298
	PLT ( $\times 10^9/L$ )	16	1.000	1.000
	LDH (U/L)	360	0.750	0.604
	IL-5 (pg/mL)	1.245	0.837	0.782
	APTT (s)	-	-	-
1-60 days and >60 days	Age (years)	49.5	0.248	2.817
	IL-10 (pg/mL)	16.73	0.771	1.277
	IL-17F (pg/mL)	2.89	0.033	5.056
	PLT ( $\times 10^9/L$ )	115	0.766	1.255
	LDH (U/L)	1996	0.172	4.876
	IL-5 (pg/mL)	1.245	0.561	1.968
	APTT (s)	34.55	0.997	1.006
1-90 days and >90 days	Age (years)	-	-	-
	IL-10 (pg/mL)	7.27	0.102	3.108
	IL-17F (pg/mL)	2.835	0.048	4.946
	PLT ( $\times 10^9/L$ )	115	0.536	1.476
	LDH (U/L)	1996	0.149	3.857
	IL-5 (pg/mL)	1.105	0.784	1.309
	APTT (s)	34.55	0.855	4.946

Through the multivariate analysis of risk factors, IL-17F in the Cox proportional hazards model analysis is that each stage of survival is a risk factor for patient death. HR are 9.044 (P = 0.025), 8.002 (P = 0.021), 12.298 (P = 0.009), 5.056 (P = 0.033), 4.946 (P = 0.048). Age  $\geq 56$  years-old are risk factors in survival times of 1-10 days and >10 days, 1-30 days and >30 days (HR = 8.452, P = 0.016; HR = 8.098, P = 0.021). IL-10  $\geq 16.73$  pg/mL was a risk factor for Survivors and non-Survivors group (HR = 4.762, P = 0.05).