·论著·

影响自发性小脑出血患者预后的相关因素分析

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摘要　目的：探讨非手术治疗的自发性小脑出血（SCH）患者预后的相关因素。**方法：**收集我院收治的接受非手术治疗的SCH患者105例的临床资料；根据随访3个月时的改良Rankin量表（mRS）评分分为预后良好组（mRS评分0～3分）和预后不良组（mRS评分4～6分）；对2组患者的临床资料进行回顾性比较和分析。**结果：**患者纳入预后良好组72例（68.4%），纳入预后不良组33例（31.3%），其中死亡25例（23.8%）。入院GCS评分、入院后血肿扩大、入院血肿直径、后颅窝紧缩征和合并糖尿病是SCH患者不良预后的独立预测因素（$P<0.05$）。入院GCS评分的时间依赖性ROC曲线下面积为0.929，入院GCS评分12分为最佳截断值；入院血肿直径的时间依赖性ROC曲线下面积为0.820，入院血肿直径3.6 cm为最佳截断值。**结论：**入院GCS评分＜12分、入院血肿直径＞3.6 cm、入院后血肿扩大、出现后颅窝紧缩征及合并糖尿病，是影响非手术治疗SCH患者3个月预后的独立危险因素。

关键词　自发性小脑出血；后颅窝；预后；改良Rankin量表；立体定向微创技术

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Analysis of Related Factors Affecting the Prognosis of Patients with Spontaneous Cerebellar Hemorrhage

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Abstract　Objective: To explore the related factors affecting prognosis of patients with spontaneous cerebellar hemorrhage (SCH) treated by non-operative treatment. **Methods:** The clinical data of 105 patients with SCH treated by non-operative treatment were collected. According to their modified Rankin Scale (mRS) scores at 3-month follow-up, patients were divided into good prognosis group (mRS 0～3) and poor prognosis group (mRS 4～6). The clinical data of two groups were compared and analyzed. **Results:** 72 patients (68.4%) were in good prognosis group and 33 (31.3%) in poor prognosis group, of which 25 cases (23.8%) died. GCS score on admission, hematoma enlargement after admission, diameter of hematoma on admission, compression sign of posterior fossa and diabetes mellitus were independent predictors of poor prognosis for non-surgical SCH patients ($P<0.05$). The time-dependent ROC curve area of the admission GCS score was 0.929, and 12 points was the best cut-off value of admission GCS score; the time-dependent ROC curve area of the admission hematoma diameter was 0.820, and 3.6 cm was the best cut-off value of admission hematoma diameter. **Conclusion:** Admission GCS score<12, admission hematoma diameter>3.6 cm, posterior fossa contraction sign, enlargement of hematoma after admission and diabetes mellitus, lead to poor prognosis, which are independent risk factors affecting the 3-month prognosis of SCH patients with non-operative treatment.

Key words　spontaneous cerebellar hemorrhage; posterior fossa; prognosis; modified Rankin scale; stereotactic minimally invasive technique

自发性小脑出血（spontaneous cerebellar hemorrhage，SCH）占临床脑出血的10%[1]，其病情复杂且早期临床表现不典型[2]。后颅窝的结构特殊，一旦发病即来势凶猛，超过20%的患者短时间内出现严重意识障碍，病死率高达75%[3]。有关非手术治疗SCH患者预后影响因素的研究较少[4]。因此，本研究对非手术治疗SCH患者的临床资料进行回顾性分析，探讨其预后的影响因素。

1　资料与方法

1.1　一般资料

纳入2014年1月至2021年1月我院收住的非手术治疗的SCH患者105例。纳入标准：符合2015年自发性脑出血诊疗指南和2019版中国脑出血诊治指南[5,6]的相关标准；经头颅CT检查确诊为SCH；年龄＞18岁；无凝血功能障碍；临床资料完整，且出院后完成随访3个月；患者本人或家属知情同意。排除标准：合并多发颅内出血；因脑外

伤、海绵状血管瘤、烟雾病、颅内肿瘤、脑梗死、颅内动脉瘤等原因所致的继发性脑出血；合并严重全身多器官功能障碍；病例资料不全；患者本人或家属拒绝。

1.2 方法

根据随访3个月时的改良Rankin量表（modified Rankin Scale，mRS）评分将患者分为预后良好组（mRS评分0～3分）和预后不良组（mRS评分4～6分）[7]。收集并比较2组患者的临床资料，分析SCH患者预后的影响因素。

临床资料定义："继发肺部感染"即患者脑出血后发生的肺部感染[8,9]；"继发心脏损伤"即发病后出现心肌损伤、心功能障碍等[9]；"后颅窝紧缩征"即后颅窝基底池受压、闭塞，第三脑室和侧脑室扩大，第四脑室受压甚至消失的影像学征象[10]；"入院后血肿扩大"即当患者病情好转后再度出现病情恶化，复查头颅CT血肿体积较前扩大≥33%或血肿量相对增多≥6 mL[11]。

1.3 统计学处理

采用SPSS 26.0和R 4.0.5统计软件进行分析，非正态分布的用中位数（IQR）和四分位间距表示，采用*Mann-Whitney U*检验；计数资料以率表示，组间比较采用χ^2检验。多因素分析采用COX回归分析；采用时间依赖性受试者工作特征曲线（receiver operator characteristic curve，ROC）计算约登指数；生存分析采用（K-M）曲线分析患者预后；$P<0.05$为差异有统计学意义。

2 结果

2.1 治疗

所有患者均根据国际高血压性脑出血指南[5,6]接受非手术治疗：根据患者病情给予适当止血药物、调整凝血功能、控制暨预防继发性脑损，必要时降低颅内压，同时控制血压、血糖、营养支持及预防深静脉血栓形成等并发症。

2.2 分组及临床指标比较

根据预后结局，患者分为预后良好组72例（68.4%）和预后不良组33例（31.3%），其中死亡25例（23.8%）。单因素分析结果显示，2组的入院格拉斯哥昏迷量表（Glasgow coma scale，GCS）评分（*P*=0.000）、入院美国国立卫生研究院卒中量表（National Institutes of Health Stroke Scale，NIHSS）评分（*P*=0.000）、合并糖尿病（*P*=0.015）、入院时血肿量（*P*=0.000）、入院血肿直径（*P*=0.000）、合并梗阻性脑积水（*P*=0.000）、破入脑室（*P*=0.002）、血肿扩大（*P*=0.001）、颅后窝紧缩征（*P*=0.000）、继发肺部感染（*P*=0.013）、血肿部位（*P*=0.033）差异有统计学意义；见表1。

2.3 影响非手术SCH患者预后的危险因素

对单因素分析有意义的指标进行COX回归分析，结果显示，入院后血肿扩大（*OR*=13.471，95% *CI*，3.972～45.685，*P*=0.000）、入院GCS评分（*OR*=0.806，95% *CI* 0.709～0.917，*P*=0.001）、入院血肿直径（*OR*=2.191，95% *CI* 1.018～4.717，*P*=0.045）、后颅窝紧缩征（*OR*=3.758，95% *CI* 1.029～13.726，*P*=0.045）和合并糖尿病（*OR*=4.685，95% *CI* 1.705～12.867，*P*=0.003）这5项是影响非手术治疗SCH患者预后的独立危险因素（$P<0.05$），见表2。

2.4 入院GCS评分和3个月预后相关性的时间依赖性ROC曲线分析

入院GCS评分的时间依赖性ROC曲线下面积为0.929，入院GCS评分12分为最佳截断值（敏感度0.891，特异性0.825，约登指数0.716，95% *CI* 0.804～0.961，$P<0.05$），见图1。

2.5 入院血肿直径和3个月预后相关性的时间依赖性ROC曲线分析

入院血肿直径的时间依赖性ROC曲线下面积为0.820，入院血肿直径3.6 cm为最佳截断值（敏感度0.717，特异性0.913，约登指数0.630，95% *CI* 0.657～0.861，$P<0.05$），见图2。

2.6 后颅窝紧缩征对非手术SCH患者预后的影响

本组105例非手术治疗的SCH患者中，合并后颅窝紧缩征的14例中预后不良高达13例（92.7%），未合并后颅窝紧缩征的91例SCH患者中预后不良仅20例（22.0%）。合并后颅窝紧缩征的SCH患者各阶段的生存率明显低于未合并者，见图3。

3 讨论

本研究的105例非手术治疗的SCH患者随访3个月时的预后不良率高达31.4%（33例），死亡率为23.8%（25例），与文献报道基本一致[12]。再次证实SCH进展迅速，预后不良。分析SCH患者的病情与预后的相关性，对改善患者预后有重要意义。

在病情评估中，最初的意识障碍即GCS评分已被证明是SCH预后不良和死亡的一个强烈风险因素[13]。Al Safatli等[14]发现入院时GCS评分较低与SCH患者30 d死亡率增加和短期预后较差相关，且是唯一预测因子，ROC曲线分析得到最佳分界点是入院时GCS评分为10分。Danmmann等[15]报道SCH患者术前GCS

表1 预后良好组与预后不良组临床资料比较

组别	例数	性别 男/女	年龄/ [岁, M(IQR)]	吸烟史/ [例(%)]	饮酒史/ [例(%)]	合并高血压/ [例(%)]	合并糖尿病/ [例(%)]	发病时间/ [h, M(IQR)]
预后良好组	72	38/34	64.5(55.3-75.8)	21(29.1)	18(25.0)	60(83.3)	4(5.5)	6.0(3.0-22.3)
预后不良组	33	21/12	72.0(61.0-77.0)	8(24.2)	4(12.1)	26(78.7)	7(21.2)	4.0(3.0-9.5)
Z/χ^2值		1.084	−1.588	0.274	2.266	0.315	5.914	−0.953
P值		0.298	0.122	0.600	0.132	0.574	0.015	0.341

组别	血肿部位/半球/蚓部/混合	入院GCS评分/ [分, M(IQR)]	入院NIHSS评分/ [分, M(IQR)]	后颅窝紧缩征/ [例(%)]	继续肺部感染/ [例(%)]	入院收缩压/ [mmHg, M(IQR)]
预后良好组	60/5/7	15.0(14.0-15.0)	2.0(0.0-4.0)	1(1.5)	23(31.7)	156.5(141.3-172.8)
预后不良组	20/4/9	8.0(5.5-13.5)	34.0(4.5-36.5)	13(39.3)	19(57.5)	150.0(136.5-183.5)
Z/χ^2值	6.816	−6.430	−6.287	28.285	6.194	−0.293
P值	0.033	0.000	0.000	0.000	0.013	0.769

组别	入院舒张压/ [mmHg, M(IQR)]	破入脑室/ [例(%)]	血肿扩大/ [例(%)]	梗阻性脑积水/ [例(%)]	入院血肿量/ [mL, M(IQR)]	入院血肿直径/ [cm, M(IQR)]	继续心脏损害/ [例(%)]
预后良好组	91.5(83.0-100.0)	27(37.5)	1(1.3)	2(2.7)	3.4(1.5-7.1)	2.4(1.8-3.2)	5(6.9)
预后不良组	91.0(80.0-107.0)	23(69.6)	6(18.1)	15(45.4)	13.5(4.0-21.9)	3.7(2.5-4.6)	4(12.1)
Z/χ^2值	−0.066	9.404	10.256	30.373	−4.690	−4.252	0.774
P值	0.948	0.002	0.001	0.000	0.000	0.000	0.379

表2 影响非手术SCH患者3个月预后的危险因素COX回归分析

相关因素	回归系数	标准误	瓦尔德	自由度	显著性	风险比	95% *CI*	
							下限	上限
入院后血肿扩大	2.601	0.623	17.419	1	0.000	13.471	3.972	45.685
入院GCS评分	−0.215	0.066	10.736	1	0.001	0.806	0.709	0.917
入院血肿直径	0.785	0.391	4.022	1	0.045	2.191	1.018	4.717
后颅窝紧缩征	1.324	0.661	4.011	1	0.045	3.758	1.029	13.726
合并糖尿病	1.544	0.516	8.946	1	0.003	4.685	1.705	12.867

评分＜13分是评估预后的独立因素。Satopää等[16]发现入院GCS评分＜8分是早期预后不良的相关因素。Troberg E等[17]报道入院时的意识水平是对死亡率最一致的独立预测因子。本研究COX回归分析示，入院GCS评分是影响SCH患者预后的独立危险因素；时间依赖ROC分析示，GCS 12分是最佳预测截断值。入院GCS评分的风险比远小于1，评分越低代表患者入院时的意识障碍越重，功能预后越差，死亡率越高。

Ho Y N等[18]对155例首发SCH患者10年的回顾性研究结果发现，首次颅脑CT扫描发现基底池闭塞的患者神经功能恶化的风险高于未闭塞基底池的患者。影像学上出现后颅窝紧缩征，不仅是梗阻性脑积水和高颅内压的一种反应，也可能代表脑干受压、受损[19]。国内研究报道，出现颅后窝紧缩改变的SCH患者很快会出现神经功能恶化，是预测住院期间神经功能恶化和总体预后的预测因子[10]。Satopää等[12]发现四叠体池受压是早期预后不良的相关因素。Pong V等[20]报道影响SCH患者预后的主要因素有环池的改变。本研究COX回归分析提出，“后颅窝紧缩征”是病情恶化的重要标志，此类患者预后不良率高达92.7%，且各阶段的生存率明显低于未出现后颅窝紧缩的患者。

有文献报道，入院时血糖水平≥140 mgdL是SCH患者预后不良的强烈预测因素[21]，与本研究结果一致。本研究COX回归分析显示合并糖尿病是SCH预后不良的独立危险因素。

国内外多项研究报道，血肿扩大会造成神经功能二次受损，是自发性脑出血预后不良的独立危险因素[22-24]。本研究中7例（6.7%）血肿扩大的患者预后不良比例达85.6%，死亡率达42.8%。入院后血肿扩大的SCH患者预后相对更差，死亡率更高，应该尽快尽早接受手术治疗。

多项研究显示，血肿直径＞3 cm是SCH早期神经功能不良和长期预后不良的独立危险因素[12,25,26]。本研究COX回归分析和时间依赖ROC曲线分析显示，头颅CT血肿最大层面的直径是SCH患者不良结局的独立预测因子，血肿直径等于3.6 cm是判断预后的最敏

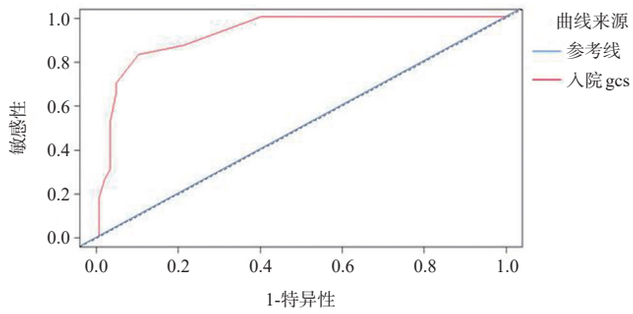


图1 入院GCS评分相关的时间依赖性ROC曲线

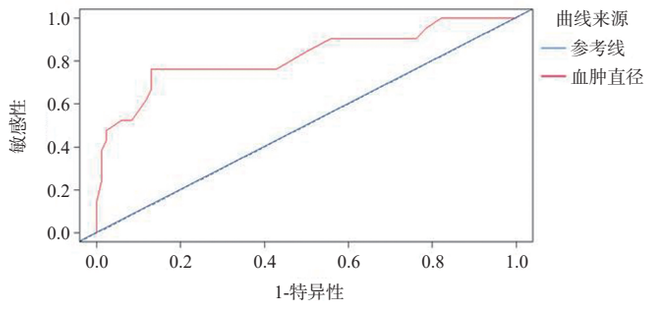
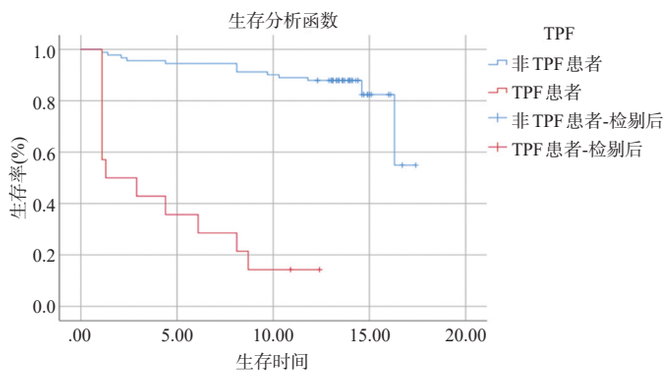


图2 入院血肿直径相关的时间依赖性ROC曲线



注：TPF：Tight posterior fossa（后颅窝紧缩征）

图3 合并后颅窝紧缩征的SCH患者生存（K-M）曲线分析

感预测因素，该指标的风险比远大于1，该类患者应该积极予以手术治疗。根据出血部位、出血的量、有无合并梗阻性脑积水等情况，需采用不同的手术方式[27,28]。在预后结局无明显差异的情况下，立体定向微创手术治疗对体积较大的SCH是一种简单、可行、有效的方法[29,30]。

综上所述，入院时GCS＜12分（即入院存在意识障碍）、入院血肿直径＞3.6 cm、出现后颅窝紧缩征、入院后血肿扩大和合并糖尿病的患者预后更差，是影响非手术治疗SCH患者3个月预后的独立危险因素。本研究尚存在一些不足，如本组资料未能测算出导致临床预后不良的血肿体积截断值，这将在后续研究中进一步完善。

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