

急性期 ^{123}I -iomazenil SPECT における対側小脳のトレーサーの 集積の程度は非致死的な高血圧性被殻・視床出血症例における 発症 3 か月後の転帰を予知する

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1 背景

高血圧性脳内出血は脳卒中全般の 15%以下を占め、転帰不良に関連する¹。被殻、視床出血を発症した症例で、年齢が高い事、臨床像が悪い事、高血糖がある事、血腫が大きい事、そして脳室内出血の存在が死亡率に関連している²⁻⁵。しかしながら意識障害がない、または軽度であり、中等度あるいは重度の麻痺を有する急性期の非致死的な被殻、視床出血症例において、長期的な予後に関連した因子の報告はほとんどない。

^{123}I -iomazenil (IMZ) 投与 180 分後に得られる SPECT 画像（晩期像）は中枢性ベンゾジアゼピン受容体結合能の分布に比例する一方で⁶⁻⁸、 ^{123}I -IMZ 投与 30 分後に得られる SPECT 画像（早期像）は脳血流分布を表す⁹。

2 目的

本研究の目的は、急性期 ^{123}I -IMZ SPECT における対側小脳のトレーサーの集積の程度が非致死的な高血圧性被殻・視床出血症例における発症 3 か月後の転帰を予知するかどうかを決めることである。

3 方法

対象は、意識障害がなく片麻痺が中等度以上の高血圧性被殻・視床出血症例。発症後 7 日以内に ^{123}I -IMZ SPECT 早期像と晩期像を撮像した。すべての SPECT 画像は、SPM2 を用いて自動的に標準脳に置き換えられた¹⁰。3D-SRT を用いて両側大脳および小脳半球に自動的に ROI を置いた (Fig.1)。大脳半球患側を健側

で割った値として大脳半球 ROI の左右比 (AR_{orb}) を、小脳半球健側を患側で割った値として小脳半球 ROI の左右比 (AR_{cbl}) を算出した。入院時および発症 3 ヶ月後に modified Rankin Scale を用いて日常生活自立度を測定した。



Fig.1

4 結果

早期像の AR_{cbl} ($\rho = 0.511$; $P = 0.003$) と晚期像の AR_{cbl} ($\rho = -0.714$; $P < 0.0001$) は発症 3 か月後の modified Rankin Scale と相関していた。多変量解析では、晚期像での低い AR_{cbl} のみが発症 3 ヶ月後の転帰不良 (modified Rankin Scale ≥ 3) 予知の独立因子であった ($P = 0.0212$) (Table.1)。

Table.1

Factor	Univariate analysis			Multivariate analysis	
	Good outcome (n = 24)	Poor outcome (n = 22)	P	95% CI	P
Age (years)	60.2 ± 10.7	68.5 ± 8.9	0.0059	0.996 to 1.326	0.0561
Male gender	16 (67%)	15 (68%)	>0.9999		
Blood glucose at the time of hospitalization (mg/dl)	140 ± 45	147 ± 36	0.2861		
Left affected hemisphere	11 (46%)	8 (36%)	0.5616		
Thalamic hemorrhage	9 (38%)	11 (50%)	0.5525		
Hematoma volume (ml)	11.5 ± 10.4	18.3 ± 12.2	0.0275	0.845 to 1.122	0.7142
Intraventricular hemorrhage	1 (4%)	7 (32%)	0.0197	0.004 to 250.000	0.9657
Modified Rankin scale score immediately before SPECT	3.5 ± 1.0	4.5 ± 0.6	0.0004	0.458 to 111.111	0.1592
AR_{orb} in early image	0.936 ± 0.042	0.937 ± 0.057	0.8089		
AR_{cbl} in early image	0.977 ± 0.036	0.939 ± 0.035	0.0006	0.001 to 1964.262	0.7060
AR_{orb} in late image	0.976 ± 0.038	0.958 ± 0.055	0.1945	0.001 to 3910.833	0.6524
AR_{cbl} in late image	1.010 ± 0.019	0.960 ± 0.041	<0.0001	0.001 to 0.003	0.0212

5 結論

本研究では、急性期 ^{123}I -iomazenil SPECT における対側小脳のトレーサーの集積の程度が非致死的高

血圧性被殻・視床出血症例における発症3か月後の転帰を予知することを示した。

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Crossed cerebellar tracer uptake on acute-stage ¹²³I-iomazenil SPECT imaging predicts 3-month functional outcome in patients with non-fatal hypertensive putaminal or thalamic hemorrhage

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Abstract

Purpose: Whereas single-photon emission computed tomography (SPECT) images obtained 180 min after administration of ¹²³I-iomazenil (late images) are proportional to the distribution of central benzodiazepine receptor binding potential, SPECT images obtained within 30 min after ¹²³I-iomazenil administration (early images) correlate with regional brain perfusion. The aim of the present study was to determine whether crossed cerebellar tracer uptake on acute-stage ¹²³I-iomazenil SPECT imaging predicts 3-month functional outcome in patients with non-fatal hypertensive putaminal or thalamic hemorrhage. **Methods:** Forty-six patients underwent early and late SPECT imaging with ¹²³I-iomazenil within 7 days after the onset of hemorrhage. A region of interest (ROI) was automatically placed in the bilateral cerebellar hemispheres using a three-dimensional stereotaxic ROI template, and the ratio of the value in the cerebellar hemisphere contralateral to the affected side to that in the ipsilateral cerebellar hemisphere (ARcbl) were calculated in each patient. Each patient's physical function was measured using the modified Rankin scale score (mRS) 3 months after onset. **Results:** ARcbl on early ($\rho = -0.511$; $P = 0.0003$) and late ($\rho = -0.714$; $P < 0.0001$) images correlated with the mRS 3 months after the onset of hemorrhage. Multivariate analysis showed that only a low ARcbl in late images was significantly associated with a poor functional outcome (mRS ≥ 3 at 3 months after onset) (95% confidence intervals, 0.001 to 0.003; $P = 0.0212$). **Conclusion:** Crossed cerebellar tracer uptake on acute-stage ¹²³I-iomazenil SPECT imaging predicts 3-month functional outcome in patients with non-fatal hypertensive putaminal or thalamic hemorrhage.