

SPECT Image Analysis using SPM in patients with Parkinson's Disease and Essential Tremor : rCBF Correlates of Immediate Surgical Outcome following Unilateral Thalamo-Pallidotomy in PD

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This study investigated alterations in regional cerebral blood flow (rCBF) in patients with PD and Essential tremor (ET) using statistical parametric mapping (SPM) and rCBF correlates of immediate surgical outcome following unilateral thalamo-pallidotomy in patients with PD. Noninvasive rCBF measurements using ^{99m}Tc-ethyl cysteinate dimer (ECD) SPECT were performed on 10 PD (60.5±8.7), 10 ET (55.5±17.7) patients and 10 healthy controls (56.2±12.0). Eight patients with PD following unilateral right thalamo-pallidotomy and five following unilateral left thalamo-pallidotomy underwent pre- and post-operative rCBF SPECT both one week before and after surgery. Acquisition were acquired within 30 min, 360 rotations with 90 projections were collected in a 128 x 128 matrix using a dual head gamma camera (Siemens, Multispect II). Data were analyzed using SPM 99. **Results:** We found definite bilateral decreased rCBF in prefrontal cortex, bilateral increased rCBF in dentate nucleus of superomedial cerebellum in patients with PD and bilateral increased rCBF in lateral aspect of cerebellum in ET, respectively, compared with healthy controls. In addition, rCBF suspiciously increased bilaterally in left dorsolateral frontal cortex in ET with equivocal clinical significance. Following 8 right and 5 left unilateral thalamo-pallidotomy in PD patients, immediate postop declines in ipsilateral fronto-temporal and temporal cortical perfusion, respectively, as well as pallidothalamic hypoperfusion were significant. **Conclusion:** SPM analysis showed that significantly decreased rCBF in bilateral prefrontal cortex and increased rCBF in dentate nucleus of superomedial cerebellum in PD and increased bilateral rCBF in lateral aspect of cerebellum in ET. Unilateral thalamo-pallidotomy in PD patients reduced the immediate post-operative rCBF declines in ipsilateral temporal (frontal) cortex as well as pallidothalamic hypoperfusion which is suggestive of thalamo-cortical diaschisis.

SPAM(statistical probablistic anatomical map)을 이용한 중뇌동맥 협착 환자의 수술전후 휴식/아세타졸아미드 부하 뇌-SPECT의 준정량적 분석

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목적: 뇌혈관질환에 있어서 뇌관류와 뇌혈관예비능을 휴식/아세타졸아미드 부하 뇌-SPECT로 평가가능하나 재판류 수술효과를 비교 평가하기 위해서는 정량적인 평가가 필요하다. 방법: 12명의 중뇌동맥 협착 환자의 표재측두동맥-중뇌동맥간 우회술 전후 휴식/아세타졸아미드 부하 뇌-SPECT를 SPM에서 공간 정규화한 후, SPAM(statistical probablistic anatomical map)을 이용하여 소뇌의 십취를 기준으로 계수 정규화한 후 부위별 관류를 준정량화하였다. 수술 전후 결과는 McNemar test로, 정상군과의 비교는 Mann Whitney test로 하였다. 결과: 수술 후 수술 부위의 휴식과 아세타졸아미드 부하시 관류 그리고 혈관예비능 모두가 유의하게 향상되었다(p<0.05). 정상군과 비교에 있어서는 휴식 시와 아세타졸아미드 부하시 관류는 정상군과 차이가 없을 정도로 호전되었으나 혈관예비능은 수술 후에도 유의한 차이를 보인다(p<0.05). 결론: SPM을 이용하여 휴식/아세타졸아미드 뇌-SPECT의 결과를 준 정량적으로 쉽게 비교 평가할 수 있다.