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Selected Abstracts

Chairpersons

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BMSCs and CoQ10 Improve Behavioral Recovery and Histological Outcome in Rat Model of Parkinson Disease

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Objective: The assessment of the ability of combined treatment of bone marrow stromal cells graft (BMSCs) and oral administration of Coenzyme (CoQ10) in rat model of Parkinson disease as a good substitute for common current Parkinson treatments, and the comparison of this combined treatment with alone application of these treatments. **Methods:** Male Wistar rats that had been grouped as control, sham, lesion, treatment with oral administration of CoQ10, treatment with graft BMSC and combined treatment with graft BMSC and oral administration of CoQ10. Oral administration of CoQ10 was started one week before the model creation procedure and continued during the whole treatment period. The laboratory model of Parkinson disease in rats was performed by injection (6-OHDA) in substantia nigra pars compacta. BMS Cells were labeled by 5-Bromo-2'-deoxyuridine (BrdU) before transplantation. Behavioral assessment before creating the model, two weeks after creating the model and eight weeks after cell transplantation was performed. Also at the end of second month of treatment, immunohistochemistry, histology and molecular Studies were performed. **Results:** Behavioral assessment of two groups of alone treatments indicated the equal recovery in comparison with lesion group ($p < 0.01$), while combined treatment of BMSC and CoQ10 showed a considerable recovery compared with lesion group ($p < 0.001$). There was no sign of gliosis and graft rejection. Immunohistochemistry studies indicated that the cells were alive after two months of application in host tissue. Cell count assessment showed that the number of neural cells in combined treatment of BMSC and Co Q10 was significant difference with others experimental groups. Molecular assessment Showed that TH gene expression levels in the combined therapy group was significant difference with others experimental groups ($p < 0.001$). **Conclusion:** The combined use of two neuroprotective treatment and replacement therapy may be effective in the treatment of Parkinson's disease.

Status of Neurointervention in Bangladesh and Preliminary Experience and Follow-Up in 54 Cases of Carotid Stenting without Distal Protection Devices

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Background and Purpose: Neurointervention techniques are used in the management of stroke and many other brain diseases. Distal Protection Device (DPD) was used to prevent embolism. But the use of DPD is not as protective as it was thought. At the same time the price of DPD is also high. **Method:** Fifty four consecutive patients with 54 carotid stenoses compose this series. Fifty patients were symptomatic had $>70\%$ stenosis and 4 patients were asymptomatic had $>80\%$ stenosis. Before treatment a baseline CT/MRI was performed in all patients. Patients received oral Aspirin (75 mg) or clopidogrel (75 mg) for at least 5 days before procedure. Alternatively a loading dose of 300 mg clopidogrel was administrated at least 4 hours before carotid stent placement. A 7 F femoral sheath was introduced into right/left femoral artery after infiltration of local anesthesia. A 7 F guide catheter was introduced near the lesion in ICA/CCA. Through guide catheter a long 0.035 inches guide wire was introduced crossing the lesion. Over the guide wire we deployed the stent. Nine cases required post stenting balloon dilatation. **Result:** Primary stent placements were successful in 54 subjects. Peri-procedural neurologic complications included 4 transient ischemic attacks. The mean duration of follow-up was 19 months (ranged 1-40 months). There was 1 death unrelated to the carotid disease and no major stroke. The degree of stenosis decreased from 83.45% before the procedure to 14.12% immediately after and 8.4% 12 months after the procedure. **Conclusion:** In this series carotid stenting without DPD was safe and effective with a low incidence of peri-procedural complications. The result from this study provides grounds for further clinical study comparing this method with carotid stenting with the use of DPD.

The Clinic Study of Extending Time Window of Intravenous Thrombolytic Therapy of Cerebral Infarction Guided by Fast MRI Scan

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Objective: We tried to investigate the possibility of extending the time window of intravenous thrombolytic therapy of cerebral infarction guided by MRI scan and evaluate its effect and incidence rate of cerebral hemorrhage. **Methods:** A total of 9 patients aged

18-80 years with hyperacute cerebral infarction were chose as objects of our study. Patients were transported into our hospital 3-12 hours after the onset of symptoms and were evaluated by CT and MRI. Each patient was given a dose of 0.9 mg/kg (maximum, 90 mg) rt-PA intravenously, 10 percent of which was given as a bolus followed by delivery of the remaining being infused in 60 minutes. CT or MRI scans were performed in 24 hours after thrombolytic treatment. NIHSS was used to evaluate the neurologic deficits before and 2h, 24h, 7d after thrombolytic treatment. Barthel index was used 7d and 90d after thrombolytic treatment to measure the short-term and long-term effects. **Results:** All patients showed a hypersignal on DWI before thrombolytic treatment, but no hypersignal were found on T2WI and FLAIR scanned by MRI. Faded signal was found on DWI and T2WI after thrombolysis. Revascularization was found in M1 or M2 segment of middle cerebral artery in 4 cases and in branches of middle cerebral artery in other 5 patients. NIHSS were 15.8 ± 6.76 , 10.8 ± 4.70 , 9.6 ± 3.35 , 8.65 ± 4.21 before and 2h, 24h, 7d after thrombolytic treatment respectively. Barthel index were 49.3 ± 18.4 , 79.8 ± 10.6 7d, 90d after thrombolytic treatment respectively. One symptomatic cerebral hemorrhage and 1 asymptomatic cerebral hemorrhage were observed. **Conclusion:** Time window of intravenous thrombolytic therapy of cerebral infarction could be extended to 12 hours after stroke onset in the guidance of fast MRI scan. Selection of acute ischemic stroke patients for thrombolytic treatment by fast MRI scan is safe and feasible.

Obstructive Sleep Apnea Hypopnea Syndrome and Carotid Atherosclerosis in Patients with Ischemic Stroke or TIA

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Objective: To evaluate the relevance between obstructive sleep apnea hypopnea syndrome (OSAHS) and carotid atherosclerosis in patients with ischemic cerebrovascular disease (ICVD). **Methods:** Eighty-seven patients diagnosed with ICVD were selected from Nanjing Stroke registration system. According to the mean apnea-hypopnea index (monitored by polysomnography), patients were classified into 4 groups with no apnea symptom, mild apnea, moderate apnea, severe apnea. In addition, according to angiography results, patients were divided into 2 groups with or without Stenosis. Classical risk factors for cardiovascular diseases were collected as well. We investigated that the effect of these risks factors and OSAHS on carotid artery stenosis in ICVD patient. **Results:** In eighty-three enrolled patients, there were with no apnea symptom (21 cases), mild apnea (24 cases), moderate apnea (27 cases) and severe apnea (11 cases) respectively. Among these 4 groups, drinking ($P=0.036$), hypertension ($P=0.004$), carotid stenosis ($P=0.006$) were statistically significant difference. Patients were with 34 cases without Stenosis and 49 with Stenosis. Univariate analysis shows that hypertension ($OR=3.589$, 95% CI 1.294-9.949, $P=0.014$), OSAHS ($OR=2.222$, 95% CI 1.340 -3.685, $P=0.002$) were risk factors for carotid stenosis. Logistic regression analysis showed that OSAHS is an independent risk factor for carotid stenosis but hypertension was on the contrary. Spearman rank correlation

analysis suggested that AHI level was positively correlated with carotid stenosis ($r=0.435$, $P=0.00$). The level of AHI in bilateral carotid stenosis group was higher than that in groups with unilateral or without carotid stenosis. **Conclusion:** OSAHS is an independent risk factor for carotid stenosis and there is a positive correlation between AHI level and the severity of the carotid stenosis; In ICVD patients with OSAHS, OSAHS may outweigh hypertension for the impact of carotid stenosis.

Dural Arteriovenous Fistulae at the Cervicomedullary Junction Manifesting as Subarachnoid Hemorrhage: Eight Case Reports with Special Reference to Pattern of Venous Drainage

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Background: Dural arteriovenous fistula (DAVF) at the cranio-cervical junction is an unusual condition with alternative presentations and, is a rare cause of intracranial subarachnoid hemorrhage (SAH). We performed a retrospective, angiographic study to predict the risk for SAH. **Methods:** There were four females and four males; ages ranged between 24 and 64 with a mean of 47.28. Among them, five presented with SAH and three had pain. Diagnose of DAVF was based on CTA, MRA and angiograph. To obtain detailed information on the location of the fistulas, arterial supply and venous drainage pattern, we performed 3D digital subtraction angiography (DSA). **Results:** Angiography demonstrated that all DAVFs were located between foramen magnum and C2 (cervicomedullary junction). Four patients (50%, 4/8), with single or main ascending venous route into the intracranial vein, all presented with intracranial SAH. Among these 4 patients, varix or pouches was identified in 3 cases (75%, 3/4). Three patients were treated by surgical interventions, while four patients were treated with endovascular techniques. Follow-up angiographs performed 6 months later revealed the complete disappearance of DAVF in 4 patients. **Conclusions:** The complete angiographic protocol for evaluation of a suspected cDAVFs or DAVFs of cervicomedullary junction should include of both external carotid, VA, thyrocervical and costocervical trunks when initial "rout" angiographic findings are negative. The cDAVFs, especially at the cervicomedullary junction or cervicomedullary junction, with ascending venous routes into the intracranial or venous varix, present an increased risk for SAH.

Investigation on the Cellular Damage of Hippocampus Neuron in a Rat Model of Chronic Cerebral Hypoperfusion

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Objective: To explore the cellular damage of hippocampus neuron in a rat model of chronic cerebral hypoperfusion. **Methods:** Rat model of chronic cerebral hypoperfusion was established by permanent bilateral common carotid arteries occlusion (2VO) in the retired rats. Eight weeks after the operation, the brains were removed and examined with histological stains, electron microscope, flow cytometer and Western Blotting. **Results:** Compared with the control group, the arrangement of hippocampus neurons in 2VO rats appeared to be more irregular, and the number of the neurons deceased partly [CA2: (34.75±3.40) vs (49.25±9.67), $P<0.05$; DG: (73.50±9.26) vs (90.75±4.35), $P<0.05$]. By electron microscopic study of hippocampus neurons in 2VO rats, the nuclei became smaller and the heterochromatin assembled in the border of the nuclei in some neurons, while cytoplasm swelled, especially in mitochondria and endoplasmic reticulum. The rate of apoptosis of hippocampus neurons in 2VO rats [(9.117±2.540)%], detected by the flow cytometer, was higher than that of sham group [(4.750±3.481)%] ($P<0.05$). The expression of pro-caspase-3 in hippocampus of 2VO rats was not altered significantly ($P>0.05$), compared with the control group. **Conclusion:** The cellular damage of hippocampus neuron in 2VO rats after eight weeks was mainly caused by apoptosis.

The Therapy of Anxiety after Stroke

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Objective: The study researched the prevalence of anxiety state earlier period, and explored the therapeutic results among the different treatment methods. **Methods:** 150 cases stroke patients were assessed respectively by Hamilton anxiety scale, and a self-designed questionnaire. The anxious patients were divided into 3 groups randomly, one group with slacken therapy, the second one with music therapy, the third one with no therapy, and compared the scores of Hamilton anxiety scale, score of neurological impairment before and after treatment. **Results:** Among 150 cases patients during earlier three days after stroke, 102 cases (68%) showed anxiety state, of which 63 cases (42%) were possible anxiety state, 9 cases (6%) were visible anxiety state and 30 cases (20%) were severe anxiety state. There was statistics significance ($P<0.05$) between two therapy groups and no therapy about slacken therapy, music therapy, Hamilton anxiety scale, score of neurological impairment, but there was no statistics significance between two therapy groups. **Conclusion:** During earlier period psychic intervention could control the symptoms of anxiety state and was beneficial for improving the neurological impairment.

Mechanism of Ischemic Infarct in Spontaneous Cerebral Arteries Dissection: 28 Cases Report

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Objective: This study investigated the mechanism of ischemic stroke induced by cerebral arteries dissection through brain imaging and cerebrovascular findings, and provides evidences for the relative strategies of therapy. **Methods:** 28 patients with acute ischemic infarct induced by cerebral arteries dissection confirmed by clinical and neuroradiological data were recruited. Mechanism of ischemic infarct was determined by the infarct lesion morphous and distribution and the mechanism of infarct of extracranial and intracranial dissection were compared. **Results:** 28 patients (19 males and 9 females) were recruited. There were 17 patients with extracranial dissection, 15 patients with extracranial internal carotid artery dissection and 2 patients with V1 segment of vertebral artery dissection. There were 11 patients with intracranial dissection, 3 patients with M1 of middle cerebral artery dissection and 6 patients with V4 segment of vertebral artery dissection and 2 patients with basilar artery dissection. 12 patients (70.6%) with only thromboembolism infarction in the extracranial dissection group, 2 patients (18.2%) in the intracranial dissection group ($\chi^2=5.390$, $P=0.020$). There were 5 patients (29.4%) with hemodynamic infarction in the extracranial dissection group, 2 patients (18.2%) in the intracranial dissection group ($\chi^2=0.449$, $P=0.503$). There were 8 patients (72.7%) with infarction resulted in obstruction of perforating branches caused by dissection lesion in the intracranial dissection group. **Conclusions:** The mechanism of ischemic stroke induced by extracranial and intracranial dissection was different. Thromboembolism was the main mechanism of infarct induced by extracranial dissection, and obstruction of perforating branches caused by dissection lesion was the main mechanism of infarct induced by intracranial dissection.

Effect of Xingnaojing on Trace Elements in Serum of Patients with Vascular Cognitive Impairment

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Objective: To study the effective of Xingnaojing on trace elements in serum and cognitive ability of patients with vascular cognitive impairment. **Methods:** There were 65 cases in patient group and 33 cases in control group. The patient group was randomly divided into Xingnaojing group (34 cases) and compound injection of red sage root group (31 cases). Cognitive function was detected by Moca and ADL. Trace elements were detected by plasma all-direct-reading spectrometer. **Result:** Zn, Ni, Cr element in patient group was relatively decreased, while Fe, Ca element was relatively increased than that of control group ($P<0.05$).

Significantly increase of Zn, Se, Cd, Pb, Cu, Ni, Co, Li, Cr in serum and improvement of Moca and ADL had been observed after therapy in Xingnaojing group. There was more improvement in Moca and ADL in Xingnaojing group than that of compound injection of red sage root group. **Conclusion:** Xingnaojing can improve the level of trace element in serum and cognitive ability in patients with vascular cognitive impairment.

The Risk Factors for Rupture of Supratentorial Brain Arteriovenous Malformations: A Statistical Study on 152 Patients

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Objective: Studies in patients with brain arteriovenous malformations (AVMs) have yielded contradictory results. We performed a retrospective study in patients with a group of supratentorial AVMs and examined the impact of demographic and angiographic features on rupture. **Methods:** The clinical and angiographic data of 152 patients with supratentorial AVMs were retrospectively analyzed. Angioarchitecture of AVMs include size and anatomical location of nidus, patterns of feeding arteries and drainage veins, retrograde outflow, accompanied variceal dilatations, venous stenosis, associated aneurysm, and ratio of AVM volume and venous diameter. The AVM was divided into 3 groups according to nidus diameter (<3cm, 3-6cm, ≥6cm). Associated aneurysm was divided into intranidal, prenidial aneurysm, and remote one was excluded. Multivariate analyses were conducted after adjustment for some variables that demonstrated and associated with a significantly increased risk of hemorrhage in univariate analyses to assess the effect of modification and interaction among potential risk factors. **Results:** In the 152 patients with supratentorial AVMs, 86 cases presented with hemorrhage and 66 were none. According to the size, 40 cases with AVM ≤3cm, 89 with AVM 3-6cm, 33 cases with AVM ≥6cm. There were 52 cases with AVMs located in functional cortex, 68 in non-functional cortex, 15 in midline region and 19 in deep location. Associated aneurysm was found in 43 cases. By univariate analyses, age, gender, size of nidus, accompanied fistula, variceal dilatation, venous stenosis and associated aneurysm were independently associated with hemorrhage. **Conclusions:** Age, gender, size of nidus, accompanied fistula, variceal dilatation, venous stenosis and associated aneurysm were independent with hemorrhage.

Effect of Stent-Assisted Angioplasty on Serum Levels of Beta-Amyloid in Patients with Intracranial and Extracranial Artery Stenosis

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Objective: The purpose of this study was to investigate the effects of stent-assisted angioplasty on serum levels of beta-amyloids (Aβ) 1-40 and 1-42 in patients with intracranial and extracranial arterial stenosis. **Methods:** Twenty-four patients with severe intracranial and/or extracranial arterial stenosis received stent-assisted angioplasty in addition to conventional treatment. Another 24 patients with a similar diagnosis received the same conventional treatment but not stent-assisted angiography and served as the control group. Serum levels of Aβ1-40 and Aβ1-42 in all patients were determined before treatment and at four and eight weeks after treatment. **Results:** The serum levels of Aβ1-40 and Aβ1-42 did not differ between the two groups before treatment. At four weeks following treatment, the serum levels of Aβ1-40 in both groups had decreased significantly ($P < 0.01$), whereas the serum levels of Aβ1-42 did not show significant changes. Eight weeks following treatment, the serum levels of Aβ1-40 in the stent-assisted angioplasty group were significantly lower than levels before treatment ($P < 0.001$) and were lower than levels in the control group ($P < 0.05$). At eight weeks, the serum levels of Aβ1-42 increased dramatically in the stent-assisted angioplasty group compared to the levels before treatment ($P < 0.01$) and the levels in control group ($P < 0.05$). The ratio of Aβ1-40/Aβ1-42 was unchanged four weeks after treatment but had declined significantly after eight weeks in the stent-assisted angioplasty group; this ratio did not change significantly in the control group at four or eight weeks after treatment. **Conclusion:** Stent-assisted angioplasty performed on patients with intracranial and extracranial arterial stenosis lowered the serum level of Aβ1-40 and decreased the ratio of Aβ1-40/Aβ1-42.

Emergent Intracranial Thrombolysis and Stenting in Acute Ischemic Stroke Patients

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Background: Endovascular recanalization therapy (ERT) is the key to successful treatment of patients with acute ischemic stroke by re-establish intracranial perfusion, especially to patients with symptoms lasted more than 3 hr or 4.5 hr. Two kinds of ERT included intracranial thrombolysis and balloon-mounted stent placement was used, the outcomes of ERT in acute ischemic stroke patient were assessed. **Methods:** From January 2006 through January 2010, 64 consecutive patients presented to our hospital with acute

ischemic strokes and underwent ERT. 26 were treated with emergent balloon-mounted stent placement and 38 were carried out intra-arterial thrombolysis by rt-PA. The medical records were reviewed and summarized. **Results:** Mean age of all patients was 68.7 ± 12.3 years (range 54–80 years), 34% were female, occlusion sites: internal carotid artery 14%; middle cerebral artery 61%; posterior circulation 25%. Endovascular pharmacological or mechanical ERT was initiated beyond 3 hours for all patients, and average time after symptom onset was 3.7 ± 2.4 hours, successful recanalization was achieved after ERT in 56 out of 64 (87.5%) treatable vessels. The rate of symptomatic intracerebral hemorrhage (ICH) was 6.2% (4 out of 64) overall, 3.1% had primary stenting, and 3.1% were in intra-arterial thrombolysis. Overall mortality was 3.1% ($n=2$), both group had one, which were fatal ICHs. The patients had an average hospital stay of 15.3 ± 11.5 days (range, 7–26 days). Patient were followed-up for 12.4 ± 10.2 months (range 6–24 months). A mean National Institutes of Health Stroke Scale (NIHSS) score was 1.26 ± 0.15 before ERT procedure, and was 3.3 ± 0.63 (range, 0–4) at the time of discharge ($P < 0.01$). A mRS score before ERT was 3.42 ± 1.28 , and was 1.56 ± 0.42 at the time of discharge ($P < 0.01$). **Conclusions:** Endovascular thrombolysis and balloon-mounted stent placement in acute ischemic stroke patients appears to be a relatively safe and effective treatment.

HMGB1 Mediates Cerebral Ischemia-Reperfusion Injury via Toll-like Receptor 4

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Background: High mobility group box 1 (HMGB1) has recently been recognized as a novel candidate in a specific upstream pathway promoting inflammation after brain ischemia. However, its downstream pathway and underlying mechanism have yet to be elucidated. **Methods and Results:** Serum HMGB1 level in patients with acute cerebral infarct (ACI) was first evaluated. HMGB1 level in the ACI group was significantly increased compared with that of control group, and correlated with the severity of neurological impairment of ACI patients as assessed with NIHSS and mRS scores. The increase of serum HMGB1 also displayed a positive correlation with elevation of TNF- α and IL-1 β . Further, in vitro experiments with culture microglia showed that recombinant human HMGB1 (rhHMGB1) stimulated activation of microglia, demonstrated by increased NF- κ B activity, production of nitric oxide, and up-regulated transcription of COX-2, TNF- α and IL-1 β . However, rhHMGB1 had no effect on microglia derived from mice lacking the toll-like receptor 4 mice (TLR4^{-/-}). We examined TLR4^{-/-} and wild-type mice (TLR4^{+/+}) in an ischemia-reperfusion injury model and tested the effects of rhHMGB1 administration following ischemia-reperfusion injury. Microinjection of rhHMGB1 in TLR4^{+/+} mice cause significantly more injury after ischemia-reperfusion, indicated by increased extent of edema, infarct area, and higher neurological scores. TLR4^{-/-} mice administered with rhHMGB1 showed moderate impairment after ischemia-reperfusion, suggesting that blocking TLR4 function can protect the brain from HMGB1-mediated ischemia-induced inflammatory injury. The TRIF pathway is not likely to be involved in HMGB1/TLR4-mediated

ischemia/reperfusion injury. **Conclusion:** HMGB1 contributes to ischemic brain injury through TLR4. TLR4 expressed by immigrant macrophages may be involved in the development of ischemic brain damage, probably by interaction with HMGB1 released from necrotic cells in the ischemic core. The TRIF pathway is not likely to be involved in HMGB1/TLR4 mediated ischemia/reperfusion injury.

Hemorrhagic Lesion Patterns in Adult Moyamoya Disease

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Objective: To investigate the hemorrhagic lesion patterns, we evaluated the angiographic changes of the anterior choroidal artery-posterior communicating artery (AChA-PCoMA) in adult MMD patients. **Methods:** Seventy-two consecutive adult patients with hemorrhagic MMD, who were identified by digital cerebral angiography in Jinling hospital between January 2004 and February 2010, were retrieved from the Nanjing Stroke Registry Program. According to the hemorrhagic sites, the lesion patterns in the hemorrhagic hemispheres were classified as follows: non-thalamus parenchymal, thalamus, primary ventricle, and subarachnoid hemorrhage. The angiographic findings of the AChA-PCoMA ipsilateral to the hemorrhagic lesions were evaluated by three-grading system. The relationship between lesion patterns and the angiographic findings was analyzed. **Results:** In the stage of normal or mild to moderate dilation of AChA-PCoMA (grade 1), non-thalamus parenchymal hemorrhage was the more frequent (16/31, 51.6%; $P=0.221$), and striatal hemorrhage presented a high incidence (5/14, 22.6%). Additionally, in the stage of exceeding dilation and abnormal extension of AChA-PCoMA (grade 2), MMD patients was highly susceptible to intraventricular hemorrhage (20/34, 58.9%; $P < 0.008$). Furthermore, subarachnoid hemorrhage (SAH) involving the posterior circulation was associated with the higher grade of AChA-PCoMA than that located in the anterior circulation ($P=0.001$). When the occlusion was situated proximal to the PCoMA of the internal carotid artery (grade 3), SAH in posterior circulation was the only subtype of hemorrhagic lesion ($P < 0.001$). **Conclusion:** In adult MMD patients, different subtypes of hemorrhagic lesions were associated with angiographic changes of AChA-PCoMA, and the angiographic characteristics may predict certain subtypes of hemorrhagic lesions.

MRI-Based Emergency Assessment of Hyperacute Stroke Thrombolysis in 12-Hour Window

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Objective: To investigate the value of magnetic resonance imaging (MRI)-based emergency assessment hyperacute stroke

thrombolysis in 12-hour window. **Methods:** Two-hundred-thirty-nine patients with 12-hour window acute ischemic stroke were examined by fast multimode magnetic resonance imaging (FMMRI) and among them, 96 (40.2%) patients with hyperacute cerebral infarction confirmed by fast multimode MRI were treated by recombinant tissue plasminogen activator (rt-PA) (0.9 mg/kg) and followed up periodically by MRI. Hyperacute cerebral infarction by multimode MRI is bright on DWI but without hyperintense on T2WI and FLAIR, and hypointense on T1WI. **Results:** The 96 patients selected by fast multimode MRI to receive thrombolytic therapy, 91/96 (94.8%) cases demonstrated good outcome, 42, 29, 20, 4 and 1 cases with 90 days modified Rankin scale scores (mRs) were 0, 1, 2, 3 and 4 (median 1); life quality Barthel index (BI) of 80-100 (median 95). The 10 patients developed asymptomatic intracranial hemorrhage (10.4%) and 1 patient developed symptomatic intracranial hemorrhage (1.0%) 6-24 hour after receiving thrombolytic therapy. **Conclusions:** Our data suggest that patients suffering from hyperacute ischemic cerebral infarction that are strong candidates for intravenous thrombolytic therapy can be identified by multimode MRI, especially to those whose time windows were undefined or beyond 3 hours after symptom onset. The regular DWI, TOF-MRA, T₂WI or FLAIR checks on patients onset in 3 hour or in 3-12 hour finishes in about 5 minutes. Multimode MRI has significant clinical potential for the treatment of hyperacute stroke patients who are candidates for receiving intravenous thrombolytic therapy. It can not only cause no delay in time, but also boost the confidence of patients and doctors in choosing thrombolytic therapy. Fast multimodal MRI-based selection of hyperacute stroke model is superior compared with the traditional DWI/PWI mismatch model for the emergency assessment of hyperacute stroke thrombolysis.

Sonic Hedgehog Protects Cortical Neurons in Oxidative Stress

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Background: Sonic Hedgehog (SHH) signaling plays an important role in embryo development and tumorigenicity. The SHH signaling pathway is activated during ischemia, but the role of its activation and the involved downstream molecules remains elusive. **Methods:** Here we report that the SHH pathway was activated in ischemic brain cells and in primary neuronal cells exposed to H₂O₂, and its activation protected neurons from apoptosis. **Results:** Activation of SHH signaling promoted expression of the anti-apoptotic gene Bcl-2 and attenuated expression of the pro-apoptotic gene Bax. H₂O₂-induced SHH activation also induced upregulation of the neurotrophic factors VEGF and BDNF. All these changes were attenuated when the SHH signaling pathway was inhibited with the smoothened (Smo) inhibitor cyclopamine. **Conclusion:** Our findings provide intriguing evidence of the neuroprotective effect of the activation of SHH signaling and suggest a potential role of SHH for the treatment of brain ischemia.

Activation of Sonic Hedgehog Improves Astrocyte Survival under Oxidative Stress

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Background: Oxidative stress has been the important pathogenesis of brain ischemia/reperfusion and brain neurodegenerative diseases such as Alzheimer's and Parkinson's diseases. Recent studies have been shown that Sonic Hedgehog (SHH) signaling pathway has been implicated in normal nervous system development, brain ischemia/reperfusion and brain neurodegenerative diseases, but the potential mechanisms of the role of SHH signaling pathway in oxidative insults is still unclear. **Methods:** Here, we show that the SHH is activated in primary cortical astrocytes exposed to H₂O₂ and exogenously administered SHH increased primary cortical astrocytes viability, preventing cell apoptosis, when astrocytes exposure to H₂O₂ for 24 h. **Results:** To provide mechanistic insight into SHH signaling pathway activation in astrocytes, we show that the function of the SHH may be mediated by the ratio of Bcl-2/Bax, and neuroprotective factors including VEGF and BDNF upregulated, whereas inhibition of the SHH signaling pathway by cyclopamine (the specific inhibitor of the SHH signaling pathway) could partially abolish the protective effects of the SHH in astrocytes exposure to H₂O₂. **Conclusion:** Together, our data indicate that SHH signaling pathway may be the potential target in oxidative insults therapy.

Synergistic Cognition-Protective Effects of bis(7)-Tacrine Inducing Neurogenesis and Inhibiting Apoptosis in Aged Rats with Acute Ischemic Stroke

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Background: As a novel dimeric AChE inhibitor, bis(7)-tacrine (B7T) not only inhibited AChE, but also modulate ligand-gated ion channels such as GABAA-, nACh-, NMDA-receptors. B7T has been shown to have multiple neuroprotective activities. However, the synergistic cognition-protective effects of B7T are still not well known in AIS (acute ischemic stroke). In this study, we sought to investigate the protective effects of B7T promoting neurogenesis, inhibiting apoptosis and improving cognition, and then analyze their correlation after AIS in aged rats. **Methods:** 30 male SD rats were randomly divided into AIS/NS (n=10), Sham/NS (n=10) and AIS/B7T (n=10) group. 12 months rats were regular rear for 1 week after establishing AIS model. Experimental AIS was induced by the stereotaxic administration of collagenase type VII into caudate nucleus. Spatial learning and memory was assessed by Morris Water Maze, immunohistochemistry and immunofluorescence was employed to detect the number of neuron hyperplasia and apoptosis in the specific zone of intracerebral hemorrhage. **Results:** Cognition assessment: Escape latency of AIS/NS group was longer than Sham/NS ($P<0.05$)

and AIS/B7T group ($P<0.05$). AIS/NS group rats stayed less time in the platform quadrant than Sham/NS ($P<0.01$) and AIS/B7T group ($P<0.01$). Times crossing the platform area in AIS/NS group were less than Sham/NS ($P<0.01$) and AIS/B7T group ($P<0.01$). Image analysis: NeuN positive cells of AIS/NS group were less than Sham/NS ($P<0.01$) and AIS/B7T group ($P<0.05$) in the marginal zone of the necrosis areas. Apoptosis cells of AIS/NS group were more than Sham/NS ($P<0.01$) and AIS/B7T group ($P<0.05$) in same area. Number of NeuN positive cells was positive related to spatial memory among AIS/NS, Sham/NS and AIS/B7T group, number of apoptosis cells was negative related to spatial memory. **Conclusion:** B7T can improve cognitive handicap, induce neurogenesis and inhibit apoptosis in aged AIS rats. B7T inducing neurogenesis and inhibiting apoptosis are important pathological mechanism of cognition improvement.

Clinical Effect of Donepezil Hydrochloride and the High Pressure Oxygen Uniting to Treat the Vascular Dementia

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Objective: To investigate the clinical effect of donepezil hydrochloride and the high pressure oxygen uniting to treat the vascular dementia. **Methods:** 93 cases of vascular dementia (vascular dementia, VD) patients were randomly divided into high-pressure oxygen, donepezil hydrochloride, uniting group (high-pressure oxygen + donepezil hydrochloride), piracetam group. The mini-mental state examinations (MMSE), Wechsler Memory Scale (WMS), Activities of Daily Living (ADL) were compared before and after treatment. **Results:** After treatment, hyperbaric oxygen, donepezil hydrochloride, uniting group which MMSE, ADL, WMS score than those before treatment markedly improved, and the control group were better than piracetam, uniting group in the treatment group was superior to pure donepezil hydrochloride group and the hyperbaric oxygen treatment group. **Conclusion:** MMSE, WMS, ADL score of patients can be significantly improved after donepezil hydrochloride and the high pressure oxygen uniting to treat, improve efficacy, it is worth further promote clinical research.

Biological Mode and CT, MRI Characteristics of the Secondary Injury on Tissue around Hematoma of Hypertensive Intracerebral Hemorrhage

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Objective: To study and discuss the concept, biological mode and CT, MRI characteristics of the secondary injury on tissue around hematoma of hypertensive intracerebral hemorrhage (HICH), mainly

the secondary hemorrhage on the penumbra on tissue around hematoma. **Method:** Clinical, CT and MRI data of HICH were collected for analysis from 295 patients during January 2008 to December 2009. Of 295 patients, 188 were male, 107 were female, the age ranged from 41 to 79 years. All patients were hospitalized via emergency treatment, and CT or MRI reexamination were taken to find out the hematoma and secondary injury around within 1~7 days after treatment. **Result:** 82 patients were involved with basal ganglia hemorrhage, 58 were thalamic hemorrhage, 31 were temporal lobe hemorrhage, 16 were parietal lobe hemorrhage, 14 were cerebellar hemorrhage, 9 were brain stem hemorrhage, 21 were frontal lobe hemorrhage, 13 were occipital lobe hemorrhage, 27 were frontal and temporal lobe hemorrhage, 24 were parietal and temporal lobe hemorrhage. 41 were hematoma running in the ventricular system. Hemorrhage appeared in different sizes, and was 2.3 cm $\times$ 4.6 cm at minimum and 3.0 cm $\times$ 8.2 cm at maximum. CT reexamination were taken for 218 patients and MRI for 77 patients within 1~7 days. 28 of the 295 patients (9.49 %) were found with injury of secondary hemorrhage on tissue around hematoma. **Conclusion:** There is a biological mode characterized mainly in ischemic necrosis, edema and secondary hemorrhage on the tissue around hematoma. The secondary hemorrhage on tissue around hematoma is one of the key modes. The secondary injury on tissue around hematoma of HICH is worthy of deeper study, as the secondary hemorrhage on the penumbra is closely related to the therapy and prognosis, and is also an important basis for fixing the diagnosis and treatment time window.

Intravenous Anesthesia in Cerebral Angiography

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Objective: To evaluate the value and safety of intravenous anesthesia in cerebral angiographic procedures. **Methods:** The propofol intravenous administration for anesthesia was applied in eighty-one patients underwent cerebral angiography and another sixty-two patients with routine local anesthesia were set as control group. The indexes including patients' heart rate, blood pressure, arterial oxygen saturation (SatO₂) and the patients feeling during procedure were observed and recorded. Anxious scales, pain index and re-visit rate were also evaluated after operation. **Results:** The patients with intravenous anesthesia were under sleeping condition during the operation, with no pain and no agony memory to the procedure. Unlike the rising of heart rate and blood pressure in local anesthesia group at the beginning of operation, the physical indexes in intravenous anesthesia group decreased slightly. These changes recovered in 5-10 min. The anxious scales, pain index and re-visit rate in intravenous anesthesia group were better than that in control group in the following days. **Conclusions:** Propofol intravenous administration was safe and effective in cerebral angiography procedure.

A Study on the Effects of Candesartan Cilexetil on High Blood Pressure Cerebral Infarct Patient's C – Reactive Protein Level

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Background: Some researches show that C-reactive protein (CRP), which is non-specific and universal reactive protein, results from tissue damage, involves in lipid peroxidation, endothelial dysfunction, arterial inflammation and other pathological processes. C-reactive protein level's increase is an independent dangerous factor for acute cerebral infarction. It is closely correlated with cerebral infarct and an important predictor for cerebral infarction. This study explores the effect of candesartan on CRP levels in hypertensive cerebral infarction patients through observing the C-reactive protein levels' variation before and after hypertensive cerebral infarction patients take candesartan cilexetil. **Objective:** To study the effect of candesartan cilexetil on the C - reactive protein (CRP) level of high blood pressure Cerebral Infarct Patient. **Methods:** 160 high blood pressure Cerebral Infarct Patients were treated randomly with routine therapy (n=80) and candesartan cilexetil (n=80). Routine group were treated with conventional therapy of acute cerebral infarction and taking antihypertensive drug rather than angiotensin II receptor antagonist if illness were stable but blood pressure remained unsatisfactory. Candesartan cilexetil group were treated with oral candesartan cilexetil 4-8mg once a day and 8 weeks a treatment course after conventional therapy. To observe the CRP level changes of admission, 1 week therapy and 8 weeks therapy. **Results:** CRP levels of cerebral infarction group were significantly higher than the comparative group ($P<0.01$), these index of routine treatment group and the candesartan cilexetil treatment group both decreased significantly ($P<0.05$) after 1 week, candesartan cilexetil group change more significant ($P<0.01$) than routine group, and both blood pressures keep stable. **Conclusion:** After candesartan cilexetil therapy the cerebral infarction patients' C-reactive protein decreased significantly and blood pressure keep stable. Candesartan cilexetil can control blood pressure but also reduced the C-reactive protein level and prevent cerebral infarction recurrence and thereby reduced high blood pressure Cerebral Infarct adverse prognosis.

Hemodynamic Characteristics of Blood Flow in Stented Cerebral Aneurism with Lattice Boltzmann Method

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Background: Hemodynamic characteristics, as a main factor for the rupture of cerebral aneurysm, have attained an increasing attention. Currently, many scholars study the effect of the stent on blood flow in cerebral aneurism by numerical simulations, and most of them assume that blood flow is Newtonian fluid. However, blood flow is usually a kind of non-Newtonian fluid, so the assumption of

blood flow as Newtonian fluid may lead to large error for some cases.

Methods: In this paper, we will use Lattice Boltzmann Method to study the hemodynamic characteristics of cerebral aneurysm, and focus on the effect of non-Newtonian on the dynamic characteristics of blood flow; and then, we further study the blood flow around and within aneurysm and the impact of stent on hemodynamic characteristics, finally, the results derived with Newtonian and non-Newtonian models are also compared. **Conclusion:** The numerical results in this work show that there is a great difference between Newtonian and non-Newtonian fluid models.

T280M and V249I Gene-Polymorphisms of Chemokine Receptor CX3CR1 in Patients with Ischemic Stroke

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Objective: To investigate T280M and V249I genotype frequencies of fractalkine's receptor CX3CR1 in patients with ischemic stroke in different countries, populations and subtypes of OCSF. **Methods:** One hundred and sixty-three cases of ischemic stroke and one hundred healthy people were registered prospectively from January 1, 2009 to October 30, 2009 in first affiliated hospital of Baotou medical college. The contents of registry include social demographic characteristics, past medical history, NIHSS, GCS, and OCSF types after admission and survival situation and mRS were followed up in 1 and 3-month survivors after stroke. At the meantime, T280M and V249I gene frequencies were detected in ischemic stroke patients and healthy controls. **Results:** TT (82.8%) and VV (73.0%) were the main genotypes in Baotou Han populations. There was statistic difference between two groups in genotype frequencies of T280M and V249I. T280M and V249I genotype frequencies of ischemic stroke group in Baotou Han populations (TT 82.8%, VV 73.0%) was different from France populations (TT 68.2%, VV 51.1%), and was similar with Japan populations (TT89.4%, VV92.3%). There were no statistic differences among subtypes respectively of OCSF clinical classification. 5. There were no relationships among the prognosis of different genotypes in gene T280M and V249I in ischemic stroke group. **Conclusion:** There are geographic and ethnic differences in T280M and V249I gene frequencies. There are no relationships between CX3CR1 gene frequencies and clinical classification and prognosis.

The Expression and Relationship of NR2B and PTEN on Rat Hippocampus Neuron Subjected to Anoxia Insult

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Background: The tumor suppressor PTEN distributes generally in cerebral cortex, cerebellum, hippocampus and apophysis mamillaris, and it maybe provide protection for ischemic injury through interaction between PTEN and NR2B receptor. To investigate the expression of N-methyl-D-aspartate receptor (NMDA) 2B and PTEN on rat hippocampus neuron with OGD model, and confirm whether there is physical association between PTEN and NR2B in rat hippocampus. **Methods:** In the OGD model with anaerobic gas mixture and deoxygenated, glucose-free extracellular solution, the quantities of NR2B in the neuronal membrane were quantitatively measured by colorimetric assay and western blotting. The expression of PTEN was analyzed by western blotting and RT-PCR. Whether there is physical association between PTEN and NMDARs in rat hippocampus was determined by western blotting and immunoprecipitation. These results were measured by OPD, Western blotting, RT-PCR and immunoprecipitation at normal, OGD, 24 h, 48 h and 72 h. **Results:** The study demonstrated that there are numerous NR2B subunit expression on neuronal membrane by OPD assay and Western blotting. There is significantly decrease of the expression and quantity of NR2B at 72 hr after oxygen and glucose deprivation (OGD) and reperfusion ($P < 0.05$). The expression level of PTEN decreased after anoxic injury and reperfusion, but no statistical difference compared with the control group emerged. There is physical association between PTEN and NR2B in rat hippocampal neuron. **Conclusion:** Our study suggests that there are numerous expressions of NR2B and PTEN in rat hippocampal neuron, which have decrease after OGD damage, and there are direct protein-protein interaction between PTEN and NR2B.

Treatment with Micro-Found Drilling Cranium and Hyperbaric Oxygen on 1000 Cases of Cerebral Hemorrhage-Patients

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Objectives: To evaluate the effect of micro-found drilling cranium and hyperbaric oxygen (HBO) on cerebral hemorrhage. **Methods:** A total of 1000 patients of cerebral hemorrhage were divided into two groups. In HBO group ($n = 500$) the patients treated with hyperbaric oxygenation after micro-found drilling cranium. In control group ($n = 500$), patients simply treated with micro-found drilling cranium. The therapeutic effects, activity of daily living and the hemodynamic parameters before and after the treatment were compared. **Results:** The efficiency of HBO treatment group was significantly higher than control group ($P < 0.05$), and the earlier it was, the better the efficiency. The independently completing daily live rate in

HBO group was significantly higher than in control group ($P < 0.05$), while the rate of serve damage in HBO group was lower than the control group ($P < 0.05$). After the treatment, cerebral circulation in the two group was better, and in the HBO group was significantly better than those in the control group ($P < 0.05$). **Conclusions:** The early treatment of HBO after micro-found drilling cranium on a cerebral hemorrhage can significantly increase the cure rate, and enhance the patients' survival quality.

The Relationship between Morphological Features of Carotid Arterial Atherosclerosis Plaque and Cardiovascular Risk Factors in the Elderly

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Objective: To study the relationship between morphological features of carotid arterial atherosclerosis plaque and various cardiovascular risk factors in elderly. **Methods:** 321 patients underwent cerebral angiography are classified two groups, including 256 patients with carotid arterial atherosclerosis and 65 patients without plaque. Analyze the relationship between carotid arterial plaque and cardiovascular risk factors, namely age, gender, TC, TG, HDL-C, LDL-C, CRP, homocysteine, hypertension, diabetes, smoking and drinking; Analyze the relationship between morphological features including the stenosis degree, surfaces fairing of carotid arterial, and cardiovascular risk factors, then prospective analyze cardiovascular and cerebrovascular events in the two groups. **Results:** Carotid atherosclerosis is connected with cardiovascular risk factors such as TC, TG, HDL-C, LDL-C, CRP, homocysteine, hypertension, diabetes and smoking. Positive correlation was showed between the stenosis degree of carotid arterial and age, smoking and diabetes. Closely correlation between morphological surfaces fairing of carotid arterial plaque and LDL-C, CRP, smoking and diabetes was detected. The stenosis degree of carotid arterial only showed positives correlation with cerebrovascular events, but the morphological features of surface fairing of carotid arterial plaque equally showed positives correlation with cerebrovascular events and cardiovascular events. **Conclusion:** The development carotid arterial atherosclerosis plaque in the aged are closely related to cardiovascular risk factors. Morphological features of carotid arterial plaque maybe respond the lever of general atherosclerosis better than stenosis degree, and it is also in close correlation with cerebrovascular events and cardiovascular events.

Meta-Analysis on Relationship between Cytotoxin-Associated Antigen A and the Subtypes of Ischemia Stroke

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Objective: Cytotoxin-associated antigen A (CagA) is one of proteins produced by *Helicobacter pylori* which prompts a stronger pathogenicity, the present study was done to systematically review the relationship between CagA and ischemia stroke. **Methods:** We searched MEDLINE, Embase and CJFD, VIP database, search the relevant case-control study with the time limit of January 1997 to July 2009, and then Meta-analyses were performed for the included studies using RevMan 5.0 software after strict screening. **Results:** Nine studies were included in this study consisting of 1045 patients with ischemia stroke and 1070 health controls, the results of Meta analysis showed the CagA-positive infection rate between case and control was statistically significant (OR=2.35, 95% CI: 1.96-2.82, $P<0.01$), CagA-positive and cerebral infarction subtypes showed that the correlation between Hp infection with CagA and Large artery atherosclerosis stroke was also significant (OR=2.95, 95%CI: 2.18-3.98, $P<0.01$); as a result of the diversity of etiological factor in case-control study, further studies are given after the standardization of the case group, then total effect was recalculated, the results showed that significant differences still existed between the two groups (OR=2.60, 95%CI: 2.10-3.22, $P<0.01$), the relationship of CagA and Large artery atherosclerosis stroke are still apparent (OR=3.06, 95%CI: 2.23-4.18, $P<0.01$). **Conclusions:** Hp with CagA-positive infection is a risk factor for stroke, especially for the large artery atherosclerotic stroke. The strength of evidence in case-control studies are weak and more prospective studies are still needed to define whether the infection by CagA-positive *H. pylori* strains is to be considered a novel risk factor for stroke and its subtypes.

Simvastatin Treating Carotid Atherosclerosis of Cerebral Infarction Patients and Prevention of Recurrence

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Backgrounds: Recent studies show that statins can adjust blood lipid, anti-atherosclerosis, has vessels and nerves protective effects of central nervous system and significantly reduces the incidence of cerebrovascular events. Present studies about prevention and treatment of cerebrovascular disease absent drugs of uniform standards, so need further study. **Methods:** 76 and 80 patients were randomly divided into treatment group and control group. Patients in treatment group orally used simvastatin 40mg every evening. Blood lipid levels, carotid atherosclerotic plaque IMT were detected in both patient groups at treatment beginning and the 24 months. Following up cerebral infarction recurrence and transient ischemic attack were also recorded. **Results:** IMT behind 2 years reduces in treatment group,

risers in control group than treatment beginning ($P<0.05$). Serum TC, TG and LDL-C decreased, HDL-C raised behind 2 years in treatment group than beginning ($P<0.05$). Inside 2 years cerebral infarction recurrent 3 cases in treatment group and 12 cases in control group, both have significantly difference ($P<0.05$). **Conclusions:** Long-time using simvastatin can reduce blood lipid levels, decreased carotid atherosclerotic plaque IMT, anti-atherosclerosis and prevent recurrence of ischemic stroke.

Clipping of AcoA Aneurysm via Un-Chief Blood Supply Pterional Approach

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Purpose: To observe the efficacy and safety of clipping of anterior communicating artery aneurysm by the un-chief blood supply of a pterional approach. **Methods:** In the 12 cases of anterior communicating artery aneurysm with preoperative 3D-DSA study of the anterior communicating artery complex regional anatomy, choose the un-chief blood supply of a pterional approach to get the right aneurysm and complex revealed satisfaction. **Results:** 12 cases of anterior communicating artery aneurysms were successfully clipped, aneurysms and anterior communicating artery complex revealed satisfactory, aneurysm clipping convenient, smooth, and safety. Slitting all of the aneurysms to confirm occlusion and reliable after the aneurysm clipping. 11 cases cured, 1 case of life care needs. **Conclusions:** Preoperative simulated by 3D-DSA pterional approach, select the side of the surgical approach which revealed the anterior communicating artery aneurysm and complex most clearly and convenient for clip aneurysm. This approach can still get a good proximal control, convenient and safe for clipping aneurysm.

Diagnosis and Treatment of Hemorrhagic Moyamoya Disease Combined with Blood Flow Associated Intracranial Aneurysm

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Objective: To explore the clinical features and treatment methods of hemorrhagic moyamoya disease combined with blood flow associated intracranial aneurysm. **Methods:** Analyze the clinical features and outcomes of hemorrhagic moyamoya disease combined with blood flow associated intracranial aneurysm. **Results:** In the patients with intra-ventricular hemorrhage, 4 cases (7.8%) suffer from blood flow associated intracranial aneurysm. In patients with subarachnoid hemorrhage, 11 cases (64.7%) have blood flow associated intracranial aneurysm. There are 11 patients who underwent surgical treatment received good results. **Conclusion:** If the CT image of patients with moyamoya disease showed subarachnoid

hemorrhage, we should highly suspect the possibility of blood flow associated intracranial aneurysms combined. For the MMD patients with aneurysms, we can use direct vascular surgery or endovascular embolization to treat the aneurysms.

Effect of Donepezil Hydrochloride on the Expression of EAAT₂ in the Hippocampus of Mice with Vascular Dementia

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Background: Evidence emerging within the last decade has shown that glutamate excitotoxicity is presumed to be involved in pathological mechanisms in vascular dementia. The excitatory amino acid transporters (EAATs) provide the primary mechanism for the reuptake of glutamate from the extra-cellular space, which will help to prevent over-activation and cytotoxicity. Donepezil hydrochloride can increase learning and memory function by its neural protective effects besides inhibiting AChE. To date the role of donepezil on EAATs has not been studied in detail. **Objective:** To observe the effect of Donepezil hydrochloride on learning and memory ability as well as on the expression of EAAT₂ in hippocampus of vascular dementia (VD) mouse following cerebral ischemia and reperfusion. **Methods:** 125 male Kunming mice were randomly divided into three groups: the sham-operated group (n=33), the model group (n=48) and the donepezil-treated group (n=44). VD mice model was made by three times of transient ischemia and reperfusion of bilateral common carotid arteries. The behavioral tests were done at the sixth week post surgery. The expression of EAAT₂ in hippocampal CA1 area was studied by immunohistochemistry staining. **Results:** Compared with sham-operated group, the ability of learning and memory of model group was damaged significantly ($P < 0.05$). Donepezil-treated mice exhibit better behavioral record compared to model group mice ($P < 0.05$). The OD value of EAAT₂ in model group was higher than the sham-operated group (0.113 ± 0.008 vs. 0.030 ± 0.002) and there was a significant difference between the two groups ($P < 0.05$). The elevation of EAAT₂ expression was strongly attenuated by donepezil treatment ($P < 0.05$). **Conclusion:** The increased expression of EAAT₂ in hippocampus is involved in the occurrence of VD. Donepezil hydrochloride probably improves learning and memory abilities by down-regulating the expression of EAAT₂.

Effect of Acupuncture on Expression of GDNF and Activation of MAPKs after Focal Cerebral Ischemic Injury in Rats

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Objective: To investigate the effect of acupuncture on the expression of GDNF and the phosphorylation of ERK1/2 and Elk-1 after focal cerebral ischemic injury in rats. **Methods:** A model of middle cerebral artery occlusion was established by intraluminal suture in adult male SD rats. Acupuncture treatment was applied daily. Animals were evaluated neurologically by Longa's method after 24 hours, and decapitated 48 hours later for 2,3,5-triphenyltetrazolium chloride staining, immunohistochemistry analysis and Western-blot detection. **Results:** Rats that underwent acupuncture treatment had a better functional recovery with a smaller infarction volume. At the same time, expression of GDNF increased more significantly whereas the expression of p-ERK1/2 and p-Elk1 decreased after acupuncture treatment. **Conclusion:** Acupuncture can protect rats from cerebral ischemic injury. The mechanism maybe involves the effect of regulating MAPK signal transduction and promoting GDNF expression.

Clinical Analysis of 17 Patients of Misdiagnosed Posterior Circulation Infarcts

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Objective: To summarize the cause of misdiagnosis for posterior circulation infarcts. **Methods:** There were 17 cases with acute posterior circulation infarcts, misdiagnosed as the other diseases in the initial stage. Retrospective survey of clinical manifestations, physical sign, auxiliary examination and misdiagnosed diseases for them were made. **Results:** 17 cases were misdiagnosed as the other diseases: Vertebrobasilar insufficiency in 11 cases, hypertensive encephalopathy in 1 case, Meniere disease in 1 case, encephalitis in 1 case, transient ischemic attack in 1 case, ophthalmocoe in 1 case, neurogliocytoma in 1 case. **Conclusion:** To reduce misdiagnosis, complete and comprehensive analysis should be made on the basis of the age, the past history, careful neurologic, physical examination and image technique. Cerebral lesions should be assessed by neuroimaging in the patients with posterior circulation ischemia, especially by MRI.

The Study of LPA and TNF in Peripheral Blood of Patients with Cerebral Infarct and Carotid Atherosclerosis

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Objective: To evaluate the role of LPA and TNF in pathogenesis of ischemic stroke. **Methods:** The level of LPA and TNF of peripheral blood in serum were measured in 160 patients with cerebral infarct in acute phase, 38 patients with cerebral infarct in recovery phase, 58 patients with carotid atherosclerosis and 35 healthy controls. **Results:** The level of LPA and TNF in serum of the patients with cerebral infarct in acute phase were significantly higher than those in recovery phase and carotid atherosclerosis ($P < 0.01$). The level of LPA and TNF in serum of the patients with cerebral infarct in recovery phase and carotid atherosclerosis were significantly higher than those of healthy controls ($P < 0.01$), but there were no statistical significances between the patients with cerebral infarct in recovery phase and carotid atherosclerosis ($P > 0.05$). **Conclusion:** The increased of LPA and TNF were not merely the response to cerebral ischemic injury, they had abnormal increased in patients with carotid atherosclerosis; they might play some role in the pathogenesis of ischemic stroke.

The Effect of Angulated Lesions on In-Hospital Complications after Intracranial Angioplasty

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Objective: To evaluate the effect of angulated lesions on in-hospital complications after intracranial angioplasty. **Methods:** Between March 2004 and May 2010, 52 patients with symptomatic intracranial arterial stenosis were performed using angioplasty. Patients were divided into two groups according to lesion angulations: low-angle ($<45^\circ$) and high-angle ($\geq 45^\circ$) groups. Lesion angle was determined by tracing the central linear axes of the intracranial artery on the proximal and distal sides of each lesion; the angle between the two axes was measured with a protractor in the projection that demonstrated the most severe angulations. In addition, we regarded transient ischemic attack (TIA), any stroke, or death as in-hospital complications after intracranial angioplasty. **Results:** There were 20 patients with high-angle lesions and 32 patients with low-angle lesions. Baseline demographic factors were similar between the two groups. There were more eccentric lesions in the high-angle groups than in the low-angle groups (70% vs. 41%, $P = 0.039$). Procedural success was 93.8% in the low-angle and 85% in the high-angle group. In-hospital complications with high-angle patients included hemorrhagic events in 2 patients, ischemic events in 2 patients, and death in 1. Two low-angle patients had ischemic events, and no patients died in hospital. In-hospital complications occurred slightly more frequently in the high-angle group (25% vs. 6.25%, $P = 0.092$). **Conclusions:** Lesion angle may influence the in-hospital complications of intracranial angioplasty.