

Blood flow velocity in medial cerebral artery during observation of own arm movement in a mirror

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Introduction: Mirror illusion consist in the fact that, standing in front of a mirror put in a sagittal plane, with our head on one side and one arm stretched forward, we can see one side of our body reflected as if it were the other side, by mirror visual feedback.

The aim of this study was to monitor blood flow changes in medial cerebral artery (MCA) by means of Transcranial Doppler (TCD) in individuals during motor tasks as well as tasks using mirror visual feedback.

Subjects and methods: Eight young healthy volunteers (four male and four female) participated in this study. TCD recording of MCA was done during each task consisting of various motor and visuo-motor activities using mirror illusion. Both MCA mean blood flow velocity (MBFV) were measured while individuals seated in a comfortable chair. The obtained MCA MBFV are presented as baseline values

Results: During the illusion of motoric hand activation, when the subject is making right hand flexions and watching its reflexion in the mirror, while the left hand is immobile, increase of mean blood flow velocity of contralateral MCA was observed (task 3 + 4.5% than in baseline values, $P = 0.017$).

Furthermore, when the subject made left hand flexions while watching the reflection of the immobile right hand in the mirror, there was increase of MBFV in right MCA (+ 5.6% than in baseline values $P = 0.044$), more pronounced than during the illusion of motoric hand activation (task3) and less than during direct vision of hand flexion (task 2 + 6.3% than in baseline values $P = 0.005$).

Conclusion: Our data showed that visual illusion of action, as well as direct action observation can increase mean blood flow value in MCA, which brings forward the possible usage of mirror illusion as a tool for motoric neurorehabilitation.

Key words: Transcranial Doppler, mirror illusion, medial cerebral artery

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Dissection of the craniocervical arteries

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Once considered rare, dissection of the internal carotid artery or vertebral artery is an increasingly recognized entity. Craniocervical arterial dissection is an uncommon cause of stroke in the general population, but is relatively common in patients below the age of 40. The early clinical manifestations are often subtle, however, permanent neurologic disability and death can result if the diagnosis is delayed. The present report describes eight patients (four men and four women) with dissection of the craniocervical arteries. Patient history was taken and clinical neurologic examinations were performed immediately upon admission. Diagnostic procedures included ultrasound (CDFI and TCD) and radiologic (computed

tomography and digital subtraction angiography) examinations. The leading symptoms were focal neurologic deficits, and headache and neck ache. Ultrasound findings (CDFI) were positive for vessel dissection in seven (87.5%) patients, and DSA was consistent with dissection in five (62.5%) patients and negative in one patient, whereas in two patients this examination was not performed due to the known allergy to contrast medium. Five (62.5%) patients were treated with anticoagulants, one with platelet aggregation suppressants, and two patients were operated on. Six (75.0%) patients showed partial post-therapeutic recovery of neurologic deficits and improvement of ultrasound findings of dissected arteries. One patient developed a stroke postoperatively, with deterioration of the motor deficit, and one patient was readmitted 3 months later for a newly developed stroke and died soon thereafter. It is concluded that early detection of craniocervical arterial dissection is important to minimize the morbidity and mortality associated with this condition.

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Response to music in patients with acute ischaemic stroke

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Background: Auditory stimulation increases mean blood flow velocity (MBFV) in the middle cerebral artery (MCA). Our aim was to monitor such changes in the affected MCA in patients with acute ischemic stroke (AIS) and to compare them with healthy individuals.

Methods: The study included 113 examinees (52 non-thrombolysed patients admitted to the hospital within 24 hours of AIS onset, and 61 healthy individuals). A baseline MCA MBFV was recorded by means of transcranial Doppler (TCD). In stroke patients only the affected MCA was insonated while in healthy controls both MCAs were recorded. MCA MBFV was monitored during listening to relaxing music for 2 minutes. The first response of MBFV increase was measured as time (Tmax) and percentage of change in amplitude (Amax). Pearson Chi-Square test was used for intergroup comparison.

Results: At baseline, stroke patients had lower MCA MBFV than healthy individuals ($P < 0.01$). In both groups there was an increase in MBFV compared to baseline values as a reaction to the music. Tmax in stroke group (15.87 ± 7.72) was significantly longer ($P < 0.01$) than Tmax in control group (9.34 ± 6.16). There was no statistically significant difference in Amax between the two groups.

Conclusion: Even though stroke patients with MCA branch occlusion have impaired blood flow in the affected MCA, music is still an effective auditory stimulus. However, their time of reaction to the music was prolonged when compared to healthy controls.

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Whiplash injury – a medicolegal issue

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Whiplash injury is the most common injury sustained in traffic accidents. On exposure to different forces, multiple neck injuries may occur. Following the injury, many patients suffer from

subjective symptoms that may even persist upon completion of medical treatment. As a result, there are serious problems in the objective evaluation of permanent consequences of the injury. The study included 40 randomly selected whiplash injury victims without previous lesions of cervical spine, and 40 equally selected patients with previously confirmed cervical degenerative changes. They all suffered from permanent whiplash injuries and applied for reimbursement for non-material damage to Zagreb Insurance Company during 2001. Sixty-seven per cent of patients underwent continuous treatment for 5–6 months, however, the sequels of whiplash injury persisted in the form of decreased motility of cervical spine, arm paresthesia, vasospasm of vertebral arteries and permanently narrowed visual field. Pathological findings were verified by objective diagnostic methods: functional X-rays of the cervical part of the spinal cord, electromyoneurographic examination of arms, transcranial Doppler sonography of vertebrobasilar arteries, visual field assessment by Goldman method, and clinical examination by medical censor. The treatment of injured patients with previous degenerative changes of cervical spine took a longer time, with a higher level of head and neck motility reduction. Ultimately, in terms of reimbursement, they were conceded a lesser degree of permanent physical damage than those without previous cervical spine lesions.

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Increased donor rate in Clinical Hospital "Sestre Milosrdnice"

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Aims: The rate of organ donation represents the level of country development. Certain attempts have been made to increase this rate. As a consequence, the constant increase of potential donors in whom brain death was confirmed was observed. Therefore we present the constant increase of donor rate from the year 2004 to 2008.

Methods: The data of all potential donors in whom the confirmation procedure for brain death was completed, were retrieved and analyzed. The percentage of donor rate in comparison to brain death persons diagnosed and in comparison to all that died in Central intensive care unit and in the whole hospital was calculated. The mean number of organs per donor was also calculated.

Results: The numbers of donors per brain death persons, from 2004 to 2008 were: 5/unknown, 6/10, 8/13, 11/13, 18/22, mean age 51, 50, 39, 48, 44 respectively. The donor rate per Central intensive care unit deaths from 2004 to 2008 was: 5.9%, 5.6%, 5.8%, 10.4%, 12.1%, and per all hospital deaths were: 0.4%, 0.5%, 0.5%, 1.5%, 1.9% respectively. The number of organs per donor from 2004 to 2008 was: 1.6; 2.4; 2.6; 3.0; 2.7.

Conclusion: The constant increase of donor rate and of organs per donor in Clinical hospital "Sestre milosrdnice" from 2004 to 2008 is visible. More education is needed in medical school and among professionals to identify brain death persons and possible donors. Campaigns in media should improve the public perception regarding this issue, too.

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Depressive migraine patients are prone to medication overuse

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Background: Depression is a frequent comorbid condition among migraine patients. Nad medication overuse is relatively common among patients with frequent headaches. The aim of our study was to determine the relationship between depression, number of days with headache per month and the number of used medications.

Patients and methods: Sixty-six patients (54 women – mean age 42 years and 8 men – mean age 42 years) with migraine (without or with aura, MO, MA) or tension-type headache (TTH) have been included into the study. MO, MA and TTH were diagnosed according to the ICHD-2 criteria. All patients fulfilled the Beck depression score which classifies depression from 1–13 as minimal (group A), 14–19 as mild (group B), 20–28 as moderate (group C) and 29–63 as severe (group D). Days with headache and the number of medications (analgesics and triptans) was obtained from all patients.

Results: There were 30 patients in group A, 17 in B, 10 in C and 9 in group D. The mean depression score was 7.4; 14.9; 23.1 and 42.1 respectively. There were 41 patients with MO, 10 with MA, 5 with TTH and 5 with MO/MA + TTH. The mean number of days with headache was 11.7 in group A; 11.2 in B; 16 in C and 12.5 in D. The mean number of analgesics and triptans used was 24.8 in group A; 25.5 in B; 35.9 in C and 43.5 in D. Although the number of days with headache per month has not significantly differed among groups, patients with moderate and severe depression take more medications for their headaches, $P < 0.05$.

Conclusions: Results of our study showed that patients with higher depression score are more likely to use a higher number of acute medications for their headaches, although the number of days with headache is similar. Our results support earlier observations that medication overuse headache is a part of the spectrum of addictive disorders.

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Prevalence of headache in adolescents

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Background: Headache is the most frequent neurological symptom; however, in adolescents headaches are often undiagnosed. The aim of this study was to examine the prevalence of primary headaches among high school children in the city of Zagreb.

Methods: This was a population-based cross-sectional study conducted in the city of Zagreb. A total of 2100 questionnaires were spread among students in 7 high schools; 2057 questionnaires were suitable for analysis. The questionnaire consisted of demographic data, and questions regarding the presence and clinical characteristics of a headache.

Results: The mean age of students was 17.2 ± 1.2 years, 50.2% were female. A total of 1300 (63.2%) of students declared that they do not suffer from headaches at all (46.2% female), 620 (30.1%) declared that they suffer from headaches frequently (58.4% female) and 137 (6.7%) occasionally (51.1% female) (Gender distribution, $\chi^2 = 25.18$, $P < 0.001$). A majority of them resides in a city (77.1%), 15.6% in a suburban area and 7.3% in a rural area. The significantly associated risk factors for headache were as follows: