Efficiency of physical rehabilitation on postural imbalance after stroke: Systematic review and meta-analysis  

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Objective  Balance disorders are frequently seen after stroke resulting in limited physical activities. The effects of current physical rehabilitation aiming at reducing postural imbalance are varied with low levels of evidence. Objectives: i) to determine the efficiency of physical rehabilitation methods on the recovery of postural imbalance in patients after stroke; ii) to assess which method is more effective when compared with one another.  

Material/Patients and methods  Search strategy: we searched Medline, Embase, Pedro, Cochrane Central Register of Controlled Trials, Pascal and Francis from inception to October 2015. All published and unpublished studies and conferences were searched. Selection criteria: – randomised controlled trials; – physical rehabilitation methods aiming at recovering postural imbalance; – in adults with stroke. Outcome measures were: the Berg Balance Scale (BBS), the Postural Assessment Scale for Stroke (PASS), static posturographic parameters (in sitting or standing conditions) and all other measurements of weight bearing distribution.  

Data collection and analysis  Two authors (AH, JDM) independently screened the articles on title, abstract and finally on full study report, according to our selection criteria. The methodological quality of studies was evaluated and the data were extracted. In addition to outcomes, measures of independence in activities of daily living (ADL) and the Barthel index (BI) were extracted. Subgroup analyses are planned according to the location of brain lesions (hemispheric, brainstem or cerebellum), the type of approaches (top-down or bottom-up), the methodological quality of studies and the overall time of rehabilitation.  

PO095  
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PO096  
Feasibly and tolerance of a rehabilitation program combined with iterative tDCS stimulations for hemiplegic patients after stroke: A case-report study  

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Objective  Transcortical direct current stimulation (tDCS) is an emerging technique in the rehabilitation of hemiplegic patients after stroke, and has been mainly evaluated for the upper limb. The feasibility and tolerance of the use of repeated stimulations on the lower limb motor cortex require a clinical evaluation.  

Observations  A 72-year-old patient, who suffered from a first ischemic stroke in the left middle cerebral artery area, on July 2015, was admitted, 6 months post-stroke, to the PRM outpatient clinic of the university hospital of Saint-Étienne, for a motor training program combined with iterative tDCS stimulations. She suffered from an initially complete sensor-motor right hemiplegia with facial paralyasis, without aphasia and apraxia. Six months post-stroke, she still presented a right hemiparesis, grade 4 on the MRC scale, a short walking distance and a debilitating fatigue. The motor training program is close to an aerobic training program, with 18 sessions 3 times a week over 6 weeks. Each session is composed of 20 min of cycloergometer interval-training followed by 20 min walking on a treadmill with a body-weight support system. During the initial 20 min of each session, the patient received a 2 mA anodal tDCS over the lower limb ipsilesional motor area. The anodal electrode was positioned on the hotspot previously identified with TMS. The cathode was placed above the contralateral sensor-motor orbit. Exercise capacity evaluation and checking for exercise contraindications were performed during a maximal exercise test. The walking performance was evaluated with the 6-minute-walking-test (6MWT) before, during and after the rehabilitation program.  

Discussion - Conclusion  The patient went through the entire rehabilitation program with no significant side-effects. The 6MWT showed a clear improvement 23% (+79 m). This example illustrates the feasibility and the good tolerance of the motor training program combined with iterative tDCS. The feasibility and tolerance will be confirmed with a series of case prior to a clinical controlled study.  

Keywords  tDCS; Hemiplegia; Stroke; Walking; Aerobic training program  

Disclosure of interest  The authors have not supplied their declaration of competing interest.  

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Results  We identified 9937 relevant studies. We excluded 8093 on titles, 1364 on abstracts and 294 on full study reports. Finally, 186 studies were included.  

Discussion - Conclusion  The interest is to determine the effects of all physical rehabilitation methods: i) not only on the postural parameters (posturography), but also on the limitations of activity (BBS, PASS) and on the independence of patients (IB, AVQ); ii) and according to the location of the brain lesions, in order to adapt the strategies of rehabilitation.  

Keywords  Meta-analysis; Efficiency; Rehabilitation; Physical therapy; Recovery; Posture; Balance; Stroke and hemiplegia  

Disclosure of interest  One of these authors (P. Jiaiaud) has a conflict of interest with GSK corporation (PhD scholarship).  

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