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Dear Editor,

We report the following case to highlight the possible relevance of non-invasive brain stimulation for the treatment of chronic neuropathic pain in Alcock canal syndrome, a relatively rare and underrecognized entrapment neuropathy of the pudendal nerve [1]. Chronic pain developing from this condition can be debilitating and difficult to treat with conservative measures and may require the use of invasive strategies. Transcranial Direct Current Stimulation (tDCS) is beginning to demonstrate its efficacy for the treatment of several pain conditions [2] and may constitute a new analgesic strategy to be used adjunctively to conservative interventions.

The patient is a 76-year-old right-handed married woman (13 years of education) who was diagnosed as suffering from Alcock canal syndrome. Pain had started 27 years before following physical trauma and severely affects the quality of her daily and social life. Pain is more pronounced on the right side and is positional - being worse when sitting. The patient's life is regulated by the attempt to reduce suffering. She cannot have a bowel movement in the morning because it causes unbearable pain for the all day, and she is constrained to evacuate just before bed-time to calm suffering with pills and sleeping. Another strategy is the use of an ice bag over the seat anytime she is sitting.

Given the evidence that anodal tDCS over primary motor cortex (M1) can relieve chronic pain [3–5] and the absence in the literature of reports on tDCS and Alcock syndrome, we referred to a previous work [6] showing reduction of postoperative analgesia by tDCS following lumbar surgery. We hypothesized that if a protocol were effective in reducing back and leg pain it could potentially be effective in reducing low back/perianal pain. TDCS (1.5 mA for 15 minutes) was delivered by a battery driven constant current stimulator (HDC stim, HDC kit, Magstim Company Limited, Whitland, Wales, UK) using a pair of surface saline-soaked sponge electrodes (5×5 cm). The anodal electrode was placed over the left M1 at a site corresponding to the trunk hotspot (between C3 and Cz, according to the electroencephalography 10–20 system) and the cathode electrode over the contralateral supraorbital area. Stimulation was applied for 5 consecutive days under double blind conditions. Although tDCS was always active, the patient and the experimenters administering the treatment were not informed of the specific daily stimulation protocol and whether tDCS was active or it was not. Clinical evaluation comprised: the Mini-Mental State Examination (MMSE), the Short-Form Healthy Survey (SF-36) and the Beck Depression Inventory – II (BDI-II). Patient's pain ratings were collected using the Visual Analogue Scale (VAS), the short form of the Brief Pain Inventory (BPI), and the Italian Pain Questionnaire (Questionario Italiano del dolore, QUID). On the VAS the patient had to evaluate pain intensity with respect to the last week (VAS_lw) or to the current state (VAS_cs). Clinical and pain evaluations were performed one week before (T-7) and one week after treatment (T7). A reduced protocol (i.e. VAS_cs and selected items of BPI) was administered on each day of stimulation to evaluate daily changes of pain perception. The VAS_cs was also administered on different days of the weeks before and after treatment.

The patient, screened for inclusion/exclusion criteria for tDCS, signed a written informed consent to participate to the study, which was approved by the Local Ethical Committee. At the time of the study pain was partially controlled by medications - pregabalin (225 mg/d), oxycodone (30 mg/d) with naloxone (15 mg/d), oxycodone (10 mg/d) with paracetamol (650 mg/d), Clonazepam (0.8 mg/d), Citalopram Hydrobromide (26 mg/d). Table 1 lists the timeline and scores of VAScs and BPI. No adverse event or side effect occurred during or after treatment. The patient - who showed a normal MMSE score (29) - spontaneously reported relief from usual pain as indicated by the possibility, during the week of treatment, to switch her 'bathroom habit' from bed-time to morning-time without negative consequences and the sensation of being able, from the second day of treatment, to skip the afternoon analgesic pill. At follow-up she also reported feelings of well-being.

Spontaneous reports of pain relief corresponded to results of pain and clinical evaluations. After treatment (T1), the patient showed a pain reduction of 60% (pre-tDCS) and 70% (post-tDCS) compared to baseline values (T-7 and T0) on VAS_cs and a pain reduction of 44% (from T-7 = 8.0 to T7 = 4.5) on VAS_lw. During and after treatment, the BPI showed a reduction of current pain intensity (i.e. pain now) that ranged from 30% to 65%, and 89% reduction of interference with life domains (from T-7 = 1.3 to T7 = 0.14).

Table 1
Study timeline and patient's scores on the VAS_cs and BPI.

	Baseline sessions			5-day treatment					Follow-up sessions		
	T-7	T-5	T-3	T0/Day1	Day2	Day3	Day4	T1/Day5	T3	T5	T7
VAS_cs	5.0	4.4 (-12%)	9.3 (+86%)	Pre = 5.0 (0%) Post = 4.4 (-12%)	Pre = 3.1 (-38%) Post = 2.2 (-56%)	Pre = 4.5 (-10%) Post = 4.3 (−14%)	Pre = 2.3 (-54%) Post = 1.8 (−64%)	Pre = 2.0 (−60%) Post = 1.5 (−70%)	3.9 (-22%)	2.3 (-54%)	7.7 (+54%)
BPI Intensity:	6.25	–	–	6.75	6.5	5	5.25	5.75	–	–	5.25
Pain at its worst	10	–	–	10	10	10	10	9	–	–	9
Pain at its least	2	–	–	3	4	2	4	3	–	–	4
Pain on average	5	–	–	5	7	5	4	5	–	–	5
Pain now	8	–	–	9	5	3	3	6	–	–	3

In Table 1 are reported the patient's score on the VAS_cs and selected items of the BPI (items 3, 4, 5, 6). During the week of treatment, the VAS_cs was administered before (Pre) and after (Post) tDCS, while BPI was administered only before stimulation. The VAS_cs was also given on Monday (T-7), Wednesday (T-5) and Friday (T-3) of the week before treatment and on the same days of the week after treatment (Monday = T3, Wednesday = T5, and Friday = T7). VAS scores are expressed in cm. For each VAS the percentage of change normalized against the score at baseline (T-7) as ([score−score at baseline]/score at baseline *100%) was computed. On the four items of the BPI the patient was asked to rate her current pain intensity and also pain in the last 24 hours at its worst, least, and average by using a numeric scale of 0–10. Each rating scale is bounded by the words "no pain" at the 0 end and "pain as bad as you can imagine" at the other end (10). Using similar scales of 0–10, the patient was also asked to rate the extent to which her pain interferes with 7 quality of life domains that include general activity, walking, mood, sleep, work, relations with other persons, and enjoyment of life. These scales are bounded by the words "does not interfere" and "interferes completely." Results of BPI Interference are reported in the text.

The SF-36 revealed a relevant positive change on how the patient rates her current health with respect to the last year (General health perception from 100 to 50, lower scores on this scale indicate improvement) and a minor interference of her physical health and emotional problems on her social activities (Social Functioning: from T-7 = 12.50 to T7 = 75.00). This last finding is consistent with the observation of some improvement on Role-physical (from: T-7 = 75 to T7 = 100) and Role-emotional (from T-7 = 66.67 to T7 = 100) scales. In contrast, she reported a slight worsening of the subjectively perceived general health (General health from T-7 = 45 to T7 = 35), likely indexing improved awareness for the disease [7]. Importantly, the BDI scores highlight a nearly one/third post-treatment reduction of the depressive symptomatology (from 14 at T-7 to 5 points at T7). Reduction of pain perception might have mitigated the depressive symptoms, as psychological distress and pain perception are strictly interrelated [8]. Finally, the QUID scores showed a relevant (50-45%) pre-post reduction of the sensitive component (from 0.36 at T-7 and 0.33 at T0 to 0.18 at T1 and T7).

To summarize, five daily sessions of anodal tDCS over the trunk area of M1 produced weeklong pain relief in a patient with pudendal neuralgia, also improving her related psychological symptoms. Future placebo controlled, double-blind studies in groups of patients are warranted to further explore and validate this promising case.

Conflicts of interest

The authors report no actual or potential conflicts of interests.

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