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Effect of leeches therapy (*Hirudo medicinalis*) in painful osteoarthritis of the knee: a pilot study

Leeches therapy was a mainstay in conventional treatment of pain and inflammatory diseases throughout antiquity until the 20th century.[1–3] There is now renewed interest in leeches therapy in the field of complementary medicine. Sales of the four principal German traders have increased continuously throughout the past few years and led to an estimated 70 000 treatments (350 000 leeches sold/year, four to five used for each single treatment) yearly in Germany (Roth M, unpublished data). The majority of these treatments aim at pain reduction in regional pain syndromes, mostly for knee osteoarthritis.[2] With the exception of its application in plastic surgery to maintain blood flow in congested skin flaps,[4 5] treatment with leeches has, however, never been evaluated in clinical studies. We conducted a non-randomised controlled pilot study to assess the onset of action and the impact of leeches therapy as an adjunctive treatment in knee osteoarthritis.

Figure 1 Treatment with four leeches at typical periarticular sites of the knee joint.

From inpatients whose main diagnosis was severe chronic back pain, we recruited over a period of three months 16 consecutive patients with primary knee osteoarthritis. All patients had had persistent knee pain for more than six months and had definite radiographic signs of knee osteoarthritis without previous injury. Major exclusion criteria were treatment with anticoagulants, secondary osteoarthritis, substantial comorbidity, and intra-articular corticosteroids in the three preceding months. All patients had an in-hospital period of 14 days and received a health education programme, with focus on exercise, physiotherapy, relaxation techniques, and diet. Regular use of non-steroidal anti-inflammatory drugs was stopped throughout the study period.

After detailed information all patients were offered additional treatment with leeches. Ten patients (eight women, mean (SD) age 69 (9) years, mean body mass index (BMI) 28.0 (4.6) kg/m^2) agreed and were treated once with four leeches (Zaug GmbH, Biebertal, Germany). Six controls (five women, mean age 68 (8) years, mean BMI 27.3 (3.0) kg/m^2) did not wish to be treated with leeches and were treated only conventionally. The leeches were applied by trained doctors topically at the painful knee joint (fig 1), and monitoring was carried out according to published recommendations.[4] The primary outcome measure was a change in total knee pain score, assessed by visual analogue scale (VAS, 0 = no pain, 10 = extremely painful) for 10 days daily, starting three days before treatment and, additionally, in a follow up 28 days after treatment.

In comparison with the controls, leech application led to rapid relief of knee pain ($p<0.05$ three days after treatment, Wilcoxon two sample test), with most effect seen within 24 hours after application and sustained and clinical relevant improvement after four weeks ($p<0.05$, Wilcoxon matched pairs test) in the absence of complications (table 1).

The mean length of treatment was 80 minutes, and the procedure was well accepted. There were no serious adverse effects and no local infections. Patients described the initial leech bite as slightly painful. There are several explanations for the observed treatment effect. The saliva of leeches contains a variety of substances such as hirudin, hyaluronidase, histamine-like vasodilators, collagenase, inhibitors of kallikrein and superoxide production, and poorly characterised anaesthetic and analgesic compounds.[6–8] Therefore, a regional analgesic and antiphlogistic effect by these substances enforced by hyaluronidase as well as counter-irritation might be possible. More importantly, we do not know the non-specific (placebo) effects of this unusual treatment. We observed an apparent mood enhancement during leeching which might explain the observed rapid treatment effect, but hardly explains the lasting pain relief after four weeks.

We recognise the limitations of the present study design as the non-random allocation of treatment, no assessment of functional improvement, and the small sample size. However, we regard the observed clear treatment effect as remarkable; treatment with leeches reduced pain significantly after three days and up to four weeks. The efficacy and safety of this traditional treatment in knee osteoarthritis should therefore be tested in larger randomised controlled trials.

The study was supported by Karl and Veronika Carstens Foundation, Germany.

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Clinical features of several connective tissue diseases with anti-Golgi antibody

Rodriguez *et al* were the first to report autoantibodies directed against the Golgi complex identified in the serum of a patient with Sjögren's syndrome (SS).[1] Since then, several isolated reports have described the

Table 1 Pain ratings (VAS, 0 = no pain, 10 = extremely painful) in patients with leech treatment and in controls; mean score and 95% confidence interval ($\bar{x} \pm 1.96$ SEM)

	Baseline	*Day 3*	*Day 4*	*Day 6*	*Day 10*	*Day 28*
Leeches (n=10)	7.4 (6.3 to 8.5)	7.2 (6.2 to 8.2)	4.1 (2.8 to 5.4)	2.4 (1.2 to 3.6)*	1.3 (0.5 to 2.8)*	1.0 (0.5 to 1.5)*
Controls (n=6)	6.3 (4.8 to 7.8)	5.8 (4.3 to 7.4)	5.8 (4.4 to 7.3)	5.2 (3.6 to 6.7)	5.2 (3.8 to 6.5)	4.8 (3.8 to 5.9)

Days 1–3: Pretreatment observation period. First rating after leeches treatment on day 4. Further ratings at days 6, 10, and 28.
*$p<0.05$ between group differences.