

524

THE EFFECT OF PULSED ELECTROMAGNETIC FIELDS ON PHYSICAL FUNCTION MEASURED BY WOMAC OSTEOARTHRITIS INDEX IN PATIENTS WITH KNEE OSTEOARTHRITIS -A PILOT STUDY

T. Nemcic, S. Grazio, F. Grubisic, V. Matijevic, H. Skala
Sestre Milosrdnice Univ. Hosp., Zagreb, Croatia

Purpose: The aim of our study was to assess the effect of pulsed electromagnetic fields (PEMFs) on physical function measured by Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) in patients with knee osteoarthritis (OA) through a single-blind placebo controlled clinical study.

Methods: Fifty-six consecutive patients, aged 60.62 ± 8.81 years, presenting to Outpatient Clinic of the Department of Rheumatology, Physical Medicine and rehabilitation, Sestre Milosrdnice University Hospital in Zagreb (Croatia) were included in this study. They met the criteria of the American College of Rheumatology (ACR) for the definition and classification of knee OA. Patients ought to have experienced knee pain for at least 14 days in the past 30 days before the beginning of the study, with pain intensity above 30 mm on the 100 mm visual analogue scale (VAS) and Kellgren-Lawrence scale grade 2 or 3 on x-ray. Average duration of the symptoms was 10.57 ± 17.64 months. During the study, the patients were allowed to be on a steady dose of pain-killers and/or non-steroidal anti-inflammatory drugs (NSAIDs) if taken before, while paracetamol could be used as an escape medication in a dose up to 2 g per day for not more than 5 consecutive days. The patients were randomly assigned into two groups: therapeutic group in which PEMF was administered (intensity 6 mT; frequency 12 Hz) and placebo group where the machine was turned off. Each patient received a total of 20 treatments that were administered for 30 minutes on 5 week days (with a weekend break). In addition, all patients were performing isometric exercises for quadriceps muscle strengthening, on daily basis. Symptoms of knee OA were assessed by the WOMAC OA Index, a questionnaire addressing severity of joint pain (5 questions), stiffness (2 questions) and limitation of physical function (17 questions). Patients fulfilled the questionnaire before the therapy, at the end of the therapy and one month after the therapy was finished. Data were analyzed by SPSS statistical program version 11.5. Apart from descriptive statistics, t-test and one-way ANOVA were used. The level of significance was set at $p < 0.05$.

Results: A total of 56 patients completed the study: 33 in the group that received PEMFs and 23 in the group that received placebo. There was no significant difference between the therapeutic and control group regarding age, body mass index (BMI), duration of symptoms and WOMAC OA Index. In both groups, there was improvement in WOMAC overall scores at the end of therapy (therapeutic group: $t=2,509$, $df=32$, $p < 0,01$; control group: $t=3,164$, $df=22$, $p < 0,01$) as well as during post-treatment follow-up (therapeutic group: $t=3,384$, $df=28$, $p < 0,01$; control group: $t=2,764$, $df=22$, $p < 0,01$). But, no significant difference between the groups was observed at the end of therapy ($F=1,134$, $df=55$, $p > 0,05$) and during follow-up ($F=0,003$; $df=55$, $p > 0,05$). Also, no statistically significant differences between the groups were found in WOMAC subscales of pain ($F=0,458$, $df=55$, $p > 0,05$), stiffness ($F=0,083$, $df=55$, $p > 0,05$) and physical function ($F=1,145$, $df=55$, $p > 0,05$). No adverse side-effects were observed during the administration of PEMFs.

Conclusions: In our sample of patients with knee OA, PEMFs showed no effect on improvement in activities of daily living, pain and stiffness measured by WOMAC OA Index. The study was limited by its small sample size. Further studies with a larger number of patients are needed to determine the possible clinical effect of PEMFs in patients with OA.

Therapy – Pharmacologic

525

CHANNA STRIATUS EXTRACT SUPPLEMENTATION SIGNIFICANTLY INCREASED PROTEIN GENE PRODUCT 9.5-IMMUNOREACTIVE NERVE FIBRES COMPARED TO ZINGIBER OFFICINALE EXTRACT IN COLLAGENASE INDUCED OSTEOARTHRITIS

S. Ganabadi

Universiti Putra Malaysia, Serdang, Selangor, Malaysia

Purpose: *Channa striatus* and *Zingiber officinale* are two natural remedies that can be useful in treating osteoarthritis. The aim of this study is to compare the protein gene related 9.5-immunoreactivity in the synovial membrane of collagenase induced osteoarthritis between *Zingiber officinale* extracts and *Channa striatus* extract supplementation.

Methods: Osteoarthritis was induced in 30 adult male Sprague Dawley rat by an intra-articular injection of $50 \mu\text{l}$ of 4mg/ml collagenase into the right stifle joint at D1 and D4. The rats were fed rat pellet and water *ad libitum*. The rats were divided into three groups: i. Group 1 is the control group and received saline, ii. Group 2 received 15ml/kg *Channa striatus* (CS) extract and iii. Group 3 received 15ml/kg of *Zingiber officinale* (ZO) extract. *Channa striatus* and *Zingiber officinale* extracts were prepared according to the methods previously described. The saline and extracts were fed orally using feeding tube from D7 to D28. At D29 the rats were sacrificed and synovial membrane sample were processed for immunohistochemistry. The fixed samples were frozen in isopentane, cooled in liquid Nitrogen and sectioned at $6 \mu\text{m}$. The sections were dehydrated in ethanol, rinsed in 0.1M phosphate buffered saline, then incubated in primary antisera against PGP 9.5 for 24 hours at 4°C . Sections were then incubated in secondary antiserum (1 hour) followed by staining using HRP/DAB detection kit (Abcam, USA).

Results: The density of PGP 9.5-immunoreactive nerve fibres (IR) in the synovial membrane was improved in the CS and ZO group. The CS group showed significantly highest number (13.3 ± 0.30) of PGP-IR nerve fibres in the right (induced joint) synovial membrane followed by the ZO (11.1 ± 0.27) and the control group (3.0 ± 0.26). However, there were no significant differences between the synovial membranes in the contra-lateral (left) joints (Table 1). When compared the PGP 9.5-immunoreactivity between the right and left synovial membrane, there were no significant difference in the CS group but the differences were significant in the ZO and control group.

The IR nerve fibres were abundant in the subintimal layer (Fig. 2) and in the CS and ZO group these fibres were found to be penetrating between synoviocytes in the intimal layer (Fig. 1). These were not found in the control group. Apart from this, the

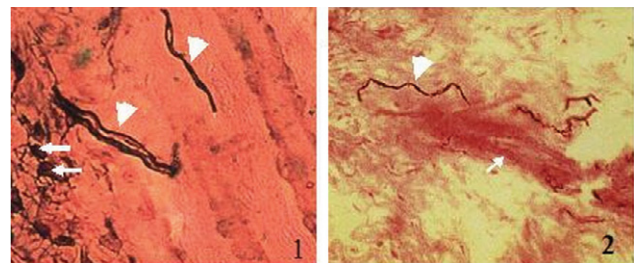


Figure 1. PGP 9.5 immunoreactive nerve fibres (arrowheads) in the intimal layer of synovial membrane from collagenase induced osteoarthritis treated with *Channa striatus* extract. The nerve fibres were penetrating between the synoviocytes (arrows).

Figure 2. PGP 9.5 immunoreactive nerve fibres (arrowhead) in the subintimal layer of synovial membrane from collagenase induced osteoarthritis treated with *Channa striatus* extract. The nerve fibres surround the blood vessel (arrow).