



AFO AKADEMIE FÜR
OSTEOPATHIE

Fifth International *Symposium* on Advances in Osteopathic Research

Friday, 10th October, 2008

Programme and Abstracts

11th International Congress of the German Association of Osteopaths (VOD)

9th – 12th October, 2008
Schlangenbad, Germany



08.30 – 08.45 **Opening** *Marina Fuhrmann D.O.,
President of the German
Association of Osteopaths
(VOD)
Florian Schwerla D.O.,
German Academy of
Osteopathy (AFO)
Research Commission*

08.45 – 09.15 **Keynote lecture** **Systematic Reviews:
An universal concept for
evaluation of diagnostic
and therapeutic proce-
dures in Medicine**
*Dr. Gerd Antes
(German Cochrane Centre)*

09.20 – 10.20 **Presentations** *Chair: Prof. Dr.med.
Karl-Ludwig Resch,
Gary Fryer PhD*

**The osteopathic treatment of patients
in coma vigil**

*Yvonne Grahl (DOK – Deutsches Osteopathie
Kolleg, Germany)*

**Question about the existence of the
ligaments of the pleural dome –
an anatomical exploration**

*Fred Scheiterbauer (Vienna School
of Osteopathy, Austria)*

**Empathy and Osteopathy. A systematic
review and cross-sectional survey**

*Christiane Hähn-Jakobs (College Sutherland,
Germany)*

**Osteopathic manipulative treatment
(OMT) effects on mandibular kinetics:
Kinesiographic study**

*Vincenzo Cozzolino (AIOT – Accademia Italiana
di Osteopatia Tradizionale, Pescara, Italy)*

**Osteopathic treatment of women
with uterine prolapse. A randomized
controlled trial**

Katja Quell (College Sutherland, Germany)

10.20 – 10.50 **Coffee break**

10.50 – 11.20 **Keynote lecture** **The Art and Science of 21st Century Osteopathy**
Gary Fryer PhD,
A. T. Still Research Institute
Kirkville, USA

11.25 am – 12.30 **Presentations** Chair: *Prof. Dr.med.*
Karl-Ludwig Resch,
Gary Fryer PhD

Effect of osteopathic manipulative treatment in essential hypertension

Francesco Cerritelli (AIOT – Accademia Italiana di Osteopatia Tradizionale, Pescara, Italy)

Trends in complaints against UK osteopaths: protocol and preliminary results

Janine Leach (Clinical Research Centre for Health Professions, University of Brighton, UK)

Test-dependent osteopathic treatment of patients suffering from craniomandibular disorders (CMD) and tinnitus. A pre-post pilot trial.

Sylvia Joachim (Still Academy, Germany)

Resting electromyographic activity of deep thoracic transversospinalis muscles identified as abnormal with palpation

Gary Fryer (A.T. Still Research Institute, Kirkville, MO, USA)

Osteopathic treatment of patients with cardiovascular somatoform autonomic dysfunctions (SAD). A randomized controlled trial.

Nicola Mühlen (Still Academy, Germany)

The osteopathic treatment of patients in coma vigil

Yvonne Grahl, Birke König (DOK – Deutsches Osteopathie Kolleg, Germany)

Objective: The progress in medicine and technology achieved in the last decades makes more and more people survive serious illnesses or accidents. Thus also the number of patients rises that survive a course of disease where death would have been inevitable in the past. States like coma or coma vigil are therefore much more common today.

In this study we wanted to investigate the influence of osteopathic treatments on the pulse and blood pressure of patients in coma vigil.

Materials and Methods: 40 patients in a German hospital in coma vigil were chosen with regard to the Glasgow-Coma-Scale where a maximum score of eight points had to be reached. All patients were osteopathically examined and received two test-dependent osteopathic treatments in an interval of 6–8 days. The aim of the first treatment was to loosen the gravest lesions, in the second treatment an influence on pulse and blood pressure was investigated with four specific autoregulation techniques. The measurement of pulse and blood pressure values took place with the patient monitor. Primary outcome parameter was to measure the short-time effect before and after the second treatment. Secondary parameter was to evaluate a long-time effect which was carried out in a two phase (pre-post) pilot intervention. In phase one patients got their standard medication for 5 days. In phase two patients received additionally the two osteopathic treatments. The medication was kept constant during this time in agreement with the hospital. For the continuous control pulse and blood pressure values were documented over a period of 10 days after the 2nd treatment.

Results: *Short-time effect:* The pulse decreased on average during treatment by 7.8 beats/min (mean before treatment 81.4 beats/min, after 73.6 beats/min). The systolic blood pressure decreased on average by 8.5 mmHg (mean before 115.7 mmHg, after 107.2 mmHg), the diastolic by 6.2 mmHg (mean before 70.1 mmHg, after 63.9 mmHg). In all cases there was a statistical significance ($p < 0.0001$).

Long-time effect: All average pulse values during the 10 days after the treatment were below the average value of the control stage (77.6. compared to 81.4 mmHg). The average values of the systolic and diastolic blood pressure remained approximately 2–3 mmHg below the initial value.

Conclusion: In this pilot study we tried to assess the influence of an osteopathic treatment on the physiological parameters pulse and blood pressure of patients in coma vigil. The results reveal a positive tendency showing that osteopathic treatment could be promising in such cases. Further examinations must show in how far a more frequent application has any further consequences, which effects are there that go beyond lowering pulse and blood pressure and if it will eventually be possible to achieve a general effect on the state of the patient in coma vigil.

Question about the existence of the ligaments of the pleural dome – an anatomical exploration

Fred Scheiterbauer (Vienna School of Osteopathy, Austria)

Objective: Assumptions found in the anatomical literature describing the ligaments of the pleural dome as inconsistent structures (Zuckermandl 1876) and explaining that the development of these ligaments can vary very much (Hafferl 1939). On the other hand an existence of these ligaments is often described in the osteopathic literature.

The objective of this work was to find out whether ligaments of the pleural dome as described in osteopathic literature really exist. Another objective was to examine whether a *M. scalenus minimus* is available and fibres of the *M. scalenus anterior* and *M. scalenus medius* merge with the *pleural dome*. This study was designed as an anatomical exploration.

Materials and Methods: Dissections were performed on 12 embalmed and 8 non-embalmed cadavers. Every ligament that could be found was measured in length and breadth.

Results: The right and left Ligamentum vertebropleurale, the right and left Ligamentum costopleurale, as well as the right Ligamentum transversopleurale respectively, could be identified in only one of 20 dissections of the dissections of these samples (Prevalence 5%, 95% CI = 1 to – 24). The left Ligamentum transversopleurale could not be identified in any of the 20 dissections. An insertion of the left Musculus scalenus minimus could be observed in seven of 20 dissections (Prevalence 35%, 95% CI = 18 to 57), the insertion of the right scalenus minimus in two dissections (Prevalence 10%, 95% CI = 3 to 30).

An insertion of the left Musculus scalenus anterior could be observed in 11 of 20 dissections (55%, 95% CI = 34 to 74), the insertion of the right anterior scalene muscle in 13 (65%, 95% CI = 43 to 82).

Insertions of the left Musculus scalenus medius could be observed most often in 18 of 20 dissections (90%, 95% CI = 70 to 97).

The right Musculus scalenus medius could be observed in 16 of the 20 dissections (80%, 95% CI = 58 to 92).

Conclusion: Especially the group of the scalene muscles contributes to the build-up of the pleural dome. The ligaments of the pleural dome play a minor role. On average they are present in 1% to 24% of the cases, i.e. this is the range of probability that one ligament is present.

The probability that all three ligaments are present is approximately zero. Thus the statements in the osteopathic literature, which give the impression that the ligaments of the pleural dome are constant structures, may be regarded as misleading.

Empathy and Osteopathy. A systematic review and cross-sectional survey

Christiane Hähn-Jakobs (College Sutherland, Germany)

Background: Empathic skills are considered as a quality criterion in the communication between therapist and patient and consequently they are going to become more and more important. The term empathy is reflected with respect to various conceptions. The fact that empathic skills influence treatment results in a positive way emphasizes the importance of the therapist's social competence.

Objectives: To represent the background and the connections between different meanings of the term empathy. Evaluation of empathic skills of practising osteopaths and demonstration of the importance of these skills in the relationship between therapist and patient.

Materials and Methods: Searching for literature was carried out in the relevant biomedical databases. The search strategy was targeted on research concerning empathy, therapist – patient relationship, and interpersonal communication. The cross-sectional survey was addressed to 63 practising German osteopaths who received a questionnaire, composed of the Jefferson Scale of Physician Empathy (JSPE) and outstanding osteopathic context related questions. The selection of the sample proceeded with reference to the list of the German Association of Osteopaths (VOD), assorted by a simple random system. The JSPE-Score showed the empathic skills of the participants and was analyzed by a Likert-Scale (minimum 20 = high empathy orientation, maximum 140 = low empathy orientation).

Results: The systematic review revealed that empathic skills develop during the first bonding between mother and child, predominantly with non-verbal mimic, gesture and touch. Those experiences in early childhood form brain structures and influence emotional behaviour. Every type of touch is linked with these very first imprinting, newly acquired emotional experiences can be integrated. The human brain has the continuing ability of learning during the whole life.

For the survey 47 osteopaths (24 women, 23 men) responded and filled in the questionnaire. The results display an average overall score of the questionnaire of 52 points (SD ± 13.5). Consequently the position of the mean score is established in the lower third and refers to a high empathic orientation of the participants. Empathy especially in therapist patient relationship was assessed by a subscale suggesting an analogue result (mean of 3.7 points, SD ± 2.4, within a range from 2 – 14). The results of the survey further emphasise the importance of non-verbal communication.

Conclusion: The study was a first step towards the integration of empathy into the osteopathic concept. Study participants demonstrate a high empathic orientation and suggest the importance of empathy in osteopathy. The quality of our work and patients satisfaction could be influenced highly by empathy.

Osteopathic manipulative treatment (OMT) effects on mandibular kinetics: Kinesiographic study

V. Cozzolino (AIOT – Accademia Italiana di Osteopatia Tradizionale, Pescara, Italy), A. Monaco, R. Cattaneo, A. Spadaro, T. Cutilli (School of Dentistry, University L'Aquila, Italy)

Objectives: Temporomandibular disorders (TMD) encompass a group of musculoskeletal conditions that involve the temporomandibular joint (TMJ) or the masticatory musculature, or both. Findings demonstrated a relationship between stomatognathic and postural systems justifying the hypothesis that muscular-skeletal impairment in one system could affect the other one. The objective of our study is to analyse possible relation between OMT and mandible kinematics in order to confirm the relationship between function of stomatognathic and postural systems.

Materials and Methods: The aim of this study was to evaluate the effects of Osteopathic Manipulative Treatment (OMT) on the mandibular kinematics in TMD patients. The study was conducted on 28 children characterized by non-specific TMD symptoms, limited mouth opening, history of trauma (delivery trauma, accidentally trauma).

The patients, by means a specific software, were randomly divided into two groups:

- 1) OMT group, all the subjects were submitted to an Osteopathic Manipulative Treatment using indirect techniques (study group);
- 2) NO intervention group (control group).

All the subjects were submitted to a first (T0) kinesiographic trend for the evaluation of the amplitude and velocity of maximal opening-closing mouth movements. The patients of the study group were submitted to a second (T1) kinesiographic trend two months after the end of OMT. Control group patients were submitted to a control (T1) kinesiographic trend six months after the first one. Kinesiographic tracks were acquired using K7I system.

Results: The kinesiographic data of the study group showed a moderate statistically significant difference ($p < 0.07$) of maximal mouth opening (MO) parameter, (T0 38 mm – T1 42.63 mm) and a highly statistically significant difference ($p < 0.03$) of maximal mouth opening velocity (MOV) parameter (T0 261.6 mm/sec – T1 316.4 mm/sec). No statistically difference (null hypothesis confirmed) of KNS parameters in the control group was observed, maximal mouth opening (MO) parameter, (T0 37.5mm – T1 37.4 mm), maximal mouth opening velocity (MOV) parameter (T0 298.5 mm/sec – T1 299.9 mm/sec).

Conclusion: The results of this study suggest as OMT can induce changes in the stomatognathic dynamics, offering a valid support in the clinical approach to TMD. Multifactorial genesis of chronic disorders is also confirmed.

Osteopathic treatment of women with uterine prolapse. A randomized controlled trial

Katja Quell, Birgit Kocheise-Miller (College Sutherland, Germany)

Objective: The main objective of this study was to evaluate whether an osteopathic treatment can improve the level of descent in women suffering from uterine prolapse and has an impact on the concomitant complaints compared to the standard intervention pelvic floor muscle training.

Materials and Methods: Forty-two women (average age 45 years) diagnosed by their gynaecologists as suffering from uterine prolapse level I or II and potential concomitant complaints took part in the study. By means of external randomization 21 women were assigned to the intervention group, 21 women to the control group. The intervention group received four osteopathic treatments in intervals of three weeks. The osteopathic treatments were administered at two private clinics. The women of the control group received four physiotherapeutic treatments (pelvic floor muscle training) over the same period in the same intervals. Osteopathic dysfunctions were recorded on the day of the treatments in accordance with the individual diagnosis of the patients and were treated based on osteopathic principles. Primary outcome parameter was the gynaecological assessed level of descent (no descent – level I – level II) in addition to an explicit recordation on a visual analogue scale (VAS).

Results: In the intervention group the level of descent improved in 13 women, in five of them the gynaecological diagnosis corresponds to "no descent". In the control group only 7 improved and 4 had the diagnoses "no descent". The explicit recordation had significantly improved from 55% to 30% on the VAS ($p < 0.001$). The improvement in the control group was less pronounced (58% to 40%, $p < 0.004$). The direct comparison of both groups, however did not reveal a statistically significant superiority of one group (between-group difference of longitudinal changes 7%, $p = 0.2$). Potential concomitant complaints, e.g. cystitis, voiding difficulties or dysmenorrhoea etc. were assessed by numeric rating scales (NRS). In the intervention group the overall score significantly improved by the end of the treatment from 42 to 22 points on the NRS ($p < 0.001$). The same positive trend could be revealed for quality of life (physical and mental health) measured by the SF-36.

Conclusion: Four osteopathic treatments of the intervention group as well as four physiotherapy sessions (pelvic floor muscle training) of the control group in intervals of three weeks had a statistically significant influence on the level of descent on women suffering from uterine prolapse suggesting a clear superiority of osteopathic intervention. An osteopathic treatment series seems to be a suitable therapeutic method in the treatment of women with uterine prolapse level I and II.

Effect of osteopathic manipulative treatment in essential hypertension

Francesco Cerritelli, Fabrizio Carinci, Gina Barlafante, Vincenzo Cozzolino, Gianfranco Pizzolorusso, Patrizia Turi, Cinzia Renzetti, Felice Pizzolorusso, Francesco Orlando (AIOT – Accademia Italiana di Osteopatia Tradizionale, Pescara, Italy)

Objective: Aim of the study is to investigate the association between osteopathic treatment and hypertension in terms of intermediate outcomes at 12 months.

Materials and Methods: A treated and control group of consecutive subjects affected by hypertension were ruled. Systolic and diastolic blood pressure, height, weight, intima media, rest rate, use of prescribed drugs were measured at entry and after 12 months follow-up. Osteopathic treatment was administered by a group of osteopaths 2 times/month. Pre-post differences at 12-months in systolic and diastolic blood pressure were considered as primary endpoints. Statistical analysis was performed on: univariate t-tests, multivariate linear regression.

Results: Out of 63 patients, 31 underwent osteopathic treatment and followed up for 12 months. Univariate statistical analysis showed no significant imbalances among treated and control groups in terms of main characteristics measured at baseline. At the end of the follow-up, baseline body mass index and systolic/diastolic blood pressure, and osteopathic treatment were significantly associated to a change in systolic blood pressure; baseline systolic/diastolic blood pressure and osteopathic treatment to a change in diastolic blood pressure. Whereas multivariate linear regression analysis showed significantly and independently association between osteopathic treatment and change in systolic blood pressure (mean difference between change in treated and control groups: -4.52 , 95% CI = -2.75 to -6.29), albeit not predictive of a significant pre-post change in diastolic blood pressure.

Conclusion: After 12 months follow-up, osteopathic treatment is associated to an improvement of blood pressure control. These results need to be validated using a wider population and randomized controlled trial.

Trends in complaints against UK osteopaths: protocol and preliminary results

Janine Leach, Adam Fiske, Anne Mandy (Clinical Research Centre for Health Professions, University of Brighton, UK), Elizabeth West (University of Greenwich, UK), Brenda Mullinger (European School of Osteopath, UK), Rachel Ives (College of Osteopaths, UK)

Objective: To provide baseline information about the frequency and type of complaints by patients against osteopaths over the past 5–10 years, and to gain greater understanding of why patients complain.

The study is one of four commissioned the National Council for Osteopathic Research to provide evidence on risk, following amendment to the Code of Conduct which requires osteopaths to inform patients of any risks associated with treatment.

Materials and Methods: Quantitative and qualitative data will be collected from the organisations which receive patients' complaints in the UK to create a profile all complaints over the study period. Interviews with a purposive sample of staff in the organisations will be analysed using Grounded Theory.

Results: The data are held by one or more of five organisations. The consistency, coding and classification vary widely. With about 3700 osteopaths in practice, the Regulator receives about 200 (< 5%) informal complaints per annum. Most are not pursued by the complainant; only about 30 per year go to a formal hearing. The largest indemnity insurer receives about 35 complaints per annum of many types – including adverse effects of treatment, medical malpractice, libel/slander and complaints about practitioner behaviour and communication – some of which involve claims for compensation or Civil or Criminal Court action.

Conclusion: This is the first study of this type in osteopathy. Major challenges are the idiosyncrasy of the data, classification of the events, and the development of an ethical, feasible protocol to gain understanding of the nature and circumstances that lead to complaints.

Test-dependent osteopathic treatment of patients suffering from craniomandibular disorders (CMD) and tinnitus. A pre-post pilot trial.

Sylvia Joachim, Sabine Kronau, Nicola Moshövel (Still Academy, Germany)

Background: Several studies in the literature describe coexisting otologic symptoms (e.g. tinnitus, vertigo, otalgia etc.) in patients suffering from craniomandibular disorders (CMD). Epidemiological research showed that the prevalence of ear symptoms in a population of CMD patients increases up to 85%.

Objective: A two phase pilot intervention study was carried out to address the question of whether a series of test-dependent osteopathic treatment of patients with tinnitus and CMD may improve their symptoms.

Materials and Methods: 31 patients (average age 39 ± 11 years) reporting symptoms of tinnitus and CMD were enrolled into the study. Condition precedent for participation was the allocation to at least one of three axes according to the „research diagnostic criteria for temporomandibular disorders (RDC/TMD) by an independent evaluator. In phase one the patients received no treatment for six weeks, in phase two they received six test-dependent osteopathic treatments in intervals of two weeks with a follow-up after three month. Outcome parameters relating to tinnitus were self-evaluated tinnitus perception as measured with a tinnitus questionnaire (TQ) and tinnitus intensity assessed by means of a visual analogue scale (VAS). Functional impairment induced by CMD symptoms was measured with a condition-specific instrument (Fink-Questionnaire) and oral health-related quality of life by the Oral Health Impact Profile (OHIP-G). Furthermore quality of life (SF-36) and depression (Depression Scale, DS) were engaged. Osteopathic dysfunctions in the visceral, parietal and cranosacral systems were recorded on the day of treatment in accordance with the individual diagnosis of the patients and were treated based on osteopathic principles.

Results: A direct comparison between the untreated period and the treatment period revealed clinically relevant improvements in the osteopathic treatment period for both outcome parameters related to the symptom of tinnitus. Difference of tinnitus intensity (VAS) was recorded by 2.7 points (95% CI = 1.6 to 3.8) and difference of tinnitus perception (TQ) by 13.6 points (95% CI = 7.5 to 19.6). Functional impairment induced by CMD symptoms (Fink-Questionnaire) improved from 4.0 to 2.4 (mean difference 1.7; 95% CI = 0.9 to 2.6). Quality of life mental health score (SF-36)

ranged from 37.5 to 45.7 (mean difference 8.5; 95% CI = 3.8 to 13.3). Depression and oral health-related quality of life did not show a significant improvement in direct comparison between the two study periods, but a relevant positive longitudinal effect during the treatment period.

Conclusion: A series of six osteopathic treatments over a period of twelve weeks were accompanied by clinically relevant positive changes of symptoms of tinnitus and CMD.

In the context of feasibility based on the methodology and findings of this study, rigorous randomised controlled studies are warranted.



Resting electromyographic activity of deep thoracic transversospinalis muscles identified as abnormal with palpation

Gary Fryer, Jane C. Johnson (A.T. Still Research Institute, Kirksville, MO, USA), Michael Bird (Truman State University, Kirksville, MO, USA), Barry Robbins (Kirksville College of Osteopathic Medicine, Kirksville, MO, USA)

Objective: Early osteopathic researchers suggested that paraspinal tissue abnormality was associated with spontaneous muscle activity, but little research since has re-examined these reports. This study examined whether EMG activity of sites in the paravertebral gutter (PVG) region that appeared abnormal to palpation were different from sites above and below that appeared normal.

Materials and Methods: Two osteopaths examined the thoracic PVG of 25 subjects with thoracic symptoms (current pain 3.3 ± 1.8 on 0–10 VAS) for consensus on the most marked level of tissue abnormality. Dual fine-wire, intramuscular electrodes were inserted into the deep transversospinalis (rotatores, multifidus) muscles at the abnormal level and in two normal sites above and below. Surface electrodes were placed over the erector spine mass adjacent to each intramuscular site. EMG signals were recording during prone baseline resting, three maximal voluntary contractions (MVC), and a second prone resting condition. Area under the curve for a 2-second period was analyzed for each condition. Resting values were normalized using MVC.

Results: When analyzed with ANOVA, there were no significant differences in normalized resting activity between the three intramuscular sites ($p = 0.25$) or between the three surface sites ($p = 0.33$). Substantial variability in normalized resting activity at each of the three intramuscular sites (mean \pm SD: abnormal 7.83 ± 8.76 ; normal 9.47 ± 8.45 and 6.65 ± 7.39) was evident. The three MVC contractions were highly repeatable (ICC=0.98).

Conclusion: There were no differences between the EMG activity at abnormal and normal sites, which suggests that factors other than muscle activity are responsible for the apparent abnormality of these tissues to palpation.

Osteopathic treatment of patients with cardiovascular somatoform autonomic dysfunctions (SAD). A randomized controlled trial.

Nicola Mühlen (Still Academy, Germany)

Background: Functional cardiovascular dysfunctions are among the most common complaints, with patients often reporting strong cardiovascular symptoms even though no apparent organic problems can be diagnosed in medical examinations.

Objective: The main objective of this study was to assess the effectiveness of a series of osteopathic treatments on patients suffering from cardiovascular somatoform autonomic dysfunctions (SAD).

Materials and Methods: Thirty-six patients (average age 48.9 years) reporting symptoms of cardiovascular SAD but without any manifest problem requiring treatment by a cardiologist were enrolled into the study. By means of external randomisation 19 patients were assigned to the intervention group, 17 patients to the control group. The intervention group received five osteopathic treatments in intervals of two weeks. The patients of the control group did not receive any treatment during the same time range of 10 weeks ("waiting list design"). Primary outcome parameters were the patients' self-evaluation of their physical symptoms and changes in those symptoms as measured with the SOMS-7 questionnaire (Screening for Somatoform Symptoms). Secondary outcome parameters were intensity of the heart-related symptoms (assessed by means of a visual analogue scale) and frequency of occurrence (Likert-Scale) as well as quality of life (SF-36) and osteopathic dysfunctions. Osteopathic dysfunctions in the visceral, parietal and craniosacral systems were recorded on the day of treatment in accordance with the individual diagnoses of the patients and were treated based on osteopathic principles.

Results: The comparison of changes between groups revealed clinically relevant improvements in the osteopathic group for the main outcome parameter SOMS. The between-group difference of changes of the SOMS-7-SSC Score (somatization symptom count) was -3.6 (95% CI = -1.5 to -7.6 , $p = 0.005$), respectively -15.5 (95% CI = -9.3 to -26.4 , $p < 0,005$) of the SOMS-7-SSI Score

(somatization severity index). In the intervention group the SOMS-7-SSC Score dropped from 22.2 to 18.1 (95% CI = -6.8 to -1.3; $p = 0.006$) and the SOMS-7-SSI Score from 46.4 to 29.7 (95% CI = -23.6 to -9.7; $p < 0.005$). In the control group no changes were observed during that time. The intensity of heart-related symptoms (68% to 20%) and the frequency (3.3 to 0.8) decreased. Physical health state (SF-36) improved in the intervention group from 35 to 42 (95% CI = 2.9 to 9.9; $p = 0.001$) and mental health state from 39 to 44 (95% CI = 0.6 to 8.5; $p = 0.03$). The three-month follow-up showed that the improvement in the intervention group remained stable regarding to all outcomes.

Conclusion: Five osteopathic treatments over a period of ten weeks led to clinically relevant positive changes of the symptoms of cardiovascular SAD. Further studies are warranted, extending the focus on reproducibility.



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