

Immunity- Osteopathic Clinical Studies

Osteopathic manipulative therapy induces early plasma cytokine release and mobilization of a population of blood dendritic cells

Walowski S, Singh M, Puertas J

PLoS ONE

2014

It has been claimed that osteopathic manipulative treatment (OMT) is able to enhance the immune response of individuals. In particular, it has been reported that OMT has the capability to increase antibody titers, enhance the efficacy of vaccination, and upregulate the numbers of circulating leukocytes. Recently, it has been shown in human patients suffering chronic low back pain, that OMT is able to modify the levels of cytokines such as IL-6 and TNF- α in blood upon repeated treatment. Further, experimental animal models show that lymphatic pump techniques can induce a transient increase of cytokines in the lymphatic circulation. Taking into account all these data, we decided to investigate in healthy individuals the capacity of OMT to induce a rapid modification of the levels of cytokines and leukocytes in circulation. Human volunteers were subjected to a mixture of lymphatic and thoracic OMT, and shortly after the levels of several cytokines were evaluated by protein array technology and ELISA multiplex analysis, while the profile and activation status of circulating leukocytes was extensively evaluated by multicolor flow cytometry. In addition, the levels of nitric oxide and C-reactive protein (CRP) in plasma were determined. In this study, our results show that OMT was not able to induce a rapid modification in the levels of plasma nitrites or CRP or in the proportion or activation status of central memory, effector memory or naïve CD4 and CD8 T cells. A significant decrease in the proportion of a subpopulation of blood dendritic cells was detected in OMT patients. Significant differences were also detected in the levels of immune molecules such as IL-8, MCP-1, MIP-1 α and most notably, G-CSF. Thus, OMT is able to induce a rapid change in the immunological profile of particular circulating cytokines and leukocytes.

The short term effect of a lymphatic pump protocol on blood cell counts in nursing home residents with limited mobility: A pilot study

Noll DR

The Journal of the American Osteopathic Association

2013

Context: Lymphatic pump techniques have the potential to alter blood cell counts and thus enhance immune function in elderly adults with diminished mobility.

Objective: To test whether an osteopathic manipulative treatment (OMT) protocol designed to enhance immune function will have an effect on lymphocyte and lymphocyte subset counts compared with a sham control group.

Design: The study design was a single-session, randomized, controlled clinical trial comparing a standardized lymphatic pump protocol with a light-touch protocol. Participants were assigned to 1 of 2 groups by using a 1:1 allocation ratio.

Setting: The study was conducted in 2 rural long-term care facilities in Missouri.

Participants: Residents in the long-term care facilities who were aged 60 years or older and who were confined to a bed or wheelchair for most of their waking hours. Twenty residents were recruited to participate in the study, and 10 were randomly assigned to each group.

Interventions: Baseline blood samples were obtained. Then each patient received a 6-minute study protocol treatment. Thirty minutes after completion, posttreatment blood samples were obtained. The

OMT protocol consisted of 3 osteopathic techniques: myofascial release to the thoracic inlet, the splenic pump, and the pedal lymphatic pump. The light touch protocol was applied to the same body areas as the OMT protocol for 6 minutes.

Outcome Measures: A pretreatment and posttreatment lymphocyte subset panel, complete blood cell count, and automated white blood cell count differential was obtained from each participant.

Results: There was a statistically significant between-group difference in mean change for platelet counts: counts in the OMT group decreased by a mean (standard deviation) of 15,400 (7947) platelets per microliter and the light touch group increased by 4,700 (17,857) platelets per microliter ($P=.004$). The between-group differences for the mean (standard deviation) absolute lymphocyte cell count, red blood cell count, hemoglobin level, and hematocrit measures all decreased, but the changes were not statistically significant relative to the control group.

Conclusion: The OMT protocol used in this pilot study modestly reduced platelet counts in nursing home residents with limited mobility

Osteopathic Manual Treatment in Patients with Diabetes Mellitus and Comorbid Chronic Low Back Pain: Subgroup Results From the OSTEOPATHIC Trial

Licciardone JC, Kearns CM, Hodge LM, Minotti DE

The Journal of the American Osteopathic Association

2013

Context: Chronic pain is often present in patients with diabetes mellitus.

Objective: To assess the effects of osteopathic manual treatment (OMT) in patients with diabetes mellitus and comorbid chronic low back pain (LBP).

Design: Randomized, double-blind, sham-controlled, 2x2 factorial trial, including OMT and ultrasound therapy (UST) interventions.

Setting: University-based study in Dallas-Fort Worth, Texas.

Patients: A subgroup of 34 patients (7%) with diabetes mellitus within 455 adult patients with nonspecific chronic LBP enrolled in the OSTEOPATHic Health outcomes In Chronic low back pain (OSTEOPATHIC) Trial.

Main Study Measures: The Outpatient Osteopathic SOAP Note Form was used to measure somatic dysfunction at baseline. A 100-mm visual analog scale was used to measure LBP severity over 12 weeks from randomization to study exit. Paired serum concentrations of tumor-necrosis factor (TNF)- α obtained at baseline and study exit were available for 6 subgroup patients.

Results: Key osteopathic lesions were observed in 27 patients (79%) with diabetes mellitus vs 243 patients (58%) without diabetes mellitus ($P=.01$). The reduction in LBP severity over 12 weeks was significantly greater in 19 patients with diabetes mellitus who received OMT than in 15 patients with diabetes mellitus who received sham OMT (mean between-group difference in changes in the visual analog scale pain score, -17 mm; 95% confidence interval [CI], -32 mm to -1 mm; $P=.04$). This difference was clinically relevant (Cohen $d=0.7$). A corresponding significantly greater reduction in TNF- α serum concentration was noted in patients with diabetes mellitus who received OMT, compared with those who received sham OMT (mean between-group difference, -6.6 pg/mL; 95% CI, -12.4 to -0.8 pg/mL; $P=.03$). This reduction was also clinically relevant (Cohen $d=2.7$). No significant changes in LBP severity or TNF- α serum concentration were associated with UST during the 12-week period.

Conclusion: Severe somatic dysfunction was present significantly more often in patients with diabetes mellitus than in patients without diabetes mellitus. Patients with diabetes mellitus who received OMT had significant reductions in LBP severity during the 12-week period. Decreased circulating levels of TNF- α may represent a possible mechanism for OMT effects in patients with diabetes mellitus. A larger

clinical trial of patients with diabetes mellitus and comorbid chronic LBP is warranted to more definitively assess the efficacy and mechanisms of action of OMT in this population.

Associations of Cytokine Concentrations With Key Osteopathic Lesions and Clinical Outcomes in Patients With Nonspecific Chronic Low Back Pain: Results From the OSTEOPATHIC Trial

Licciardone JC, Kearns CM, Hodge LM, Bergamini MVW

The Journal of the American Osteopathic Association

2012

Context: Little is known about the role that cytokines play in osteopathic manual treatment (OMT) of patients with chronic low back pain (LBP).

Objective: To measure the baseline concentrations of interleukin (IL)-1 β , IL-6, IL-8, IL-10, and tumor necrosis factor (TNF)- α in patients with chronic LBP; the correlations of these cytokine concentrations with clinical measures, including the number of key osteopathic lesions; the changes in cytokine concentrations with OMT; and the association of such changes with clinical outcomes.

Design: Substudy nested within a randomized controlled trial of OMT for nonspecific chronic LBP.

Setting: University-based study in Dallas-Fort Worth, Texas.

Patients: Seventy adult research patients with nonspecific chronic LBP.

Main Outcome Measures: A 10-cm visual analog scale, the Roland-Morris Disability Questionnaire, and the Medical Outcomes Study Short Form-36 Health Survey were used to measure LBP severity, back-specific functioning, and general health, respectively.

Results: At baseline, IL-1 β ($p=0.33$; $P=.005$) and IL-6 ($p=0.32$; $P=.006$) were each correlated with the number of key osteopathic lesions; however, only IL-6 was correlated with LBP severity ($p=0.28$; $P=.02$).

There was a significantly greater reduction of TNF- α concentration after 12 weeks in patients who received OMT compared with patients who received sham OMT (Mann-Whitney $U=251.5$; $P=.03$).

Significant associations were found between OMT and a reduced TNF- α concentration response at week 12 among patients who achieved moderate (response ratio, 2.13; 95% confidence interval [CI], 1.11-4.06; $P=.006$) and substantial (response ratio, 2.13; 95% CI, 1.07-4.25; $P=.01$) LBP improvements, and improvement in back-specific functioning (response ratio, 1.68; 95% CI, 1.04-2.71; $P=.03$).

Conclusions: This study found associations between IL-1 β and IL-6 concentrations and the number of key osteopathic lesions and between IL-6 and LBP severity at baseline.

However, only TNF- α concentration changed significantly after 12 weeks in response to OMT. These discordant findings indicate that additional research is needed to elucidate the underlying mechanisms of action of OMT in patients with nonspecific chronic LBP.

Preventative osteopathic manipulative treatment and the elderly nursing home resident: A pilot study

Snider KT, Snider EJ, Johnson JC, Hagan C, Schoenwald C

The Journal of the American Osteopathic Association

2012

Context: Elderly nursing home residents are generally in poor health. Many residents report pain on a daily basis, few are independent in their activities of daily living, and most take a large number of medications.

Objective: To investigate the benefits elderly nursing home residents may receive from preventative osteopathic manipulative treatment (OMT) designed to optimize structure and function and enhance their bodies' homeostatic mechanisms.

Methods: Volunteer nursing home residents were randomly assigned to 1 of 3 groups: (1) OMT, (2) light touch (LT), or (3) treatment as usual (TAU). The OMT group received an OMT protocol twice per month

for 5 months, for a total of 10 visits. The LT group received a light-touch protocol meant to simulate OMT at the same frequency as the OMT group. The TAU group received no intervention. Participant health information from Minimum Data Set assessments was monitored during the study, along with hospitalizations, emergency room visits, and outpatient procedures. The nursing home personnel and the participants' attending physicians were blinded to treatment group assignment.

Results: Twenty-one participants completed the study: 8 in the OMT group, 6 in the LT group, and 7 in the TAU group. The OMT and LT groups had fewer hospitalizations ($P=.04$) and decreased medication usage ($P=.001$) compared with the TAU group.

Conclusion: Twice monthly OMT and LT protocols reduced the number of hospitalizations and decreased medication usage in elderly nursing home residents

Impact of osteopathic manipulative treatment on secretory immunoglobulin A levels in a stressed population

Saggio G, Docimo S, Pilc J, Norton J, Gilliar W

The Journal of the American Osteopathic Association

2011

Context: High levels of human secretory immunoglobulin A (sIgA) have been shown to decrease the incidence of acquiring upper respiratory tract infections. Osteopathic manipulative treatment (OMT) has been shown to improve cardiac indices, increase lymph flow rates through the thoracic duct, and decrease sympathetic tone in postoperative patients and those in intensive care. Therefore, we hypothesized that OMT may also increase sIgA levels in people under high levels of emotional and psychological stress, thereby enhancing immunity and potentially preventing subsequent infections.

Objective: To determine if OMT increases sIgA levels in highly stressed individuals.

Methods: Twenty-five second-year osteopathic medical students were randomly assigned to an experimental group ($n=12$) or a control group ($n=13$). All participants were scheduled to take their national board examination (Comprehensive Osteopathic Medical Licensing Examination-USA) within 2 to 3 weeks after the experiment. After each participant submitted a saliva sample for a baseline sIgA level assessment, the experimental group received 20 minutes of OMT while the control group sat quietly and relaxed in a separate area for 20 minutes. Participants in both groups rested quietly for 1 hour after the 20-minute session and then submitted a second saliva sample.

Results: A 2×2 repeated measures analysis of variance revealed that the experimental group displayed a statistically significant greater increase in postintervention sIgA levels than the control group ($F_{1,23}, 5.92; P<.025$).

Conclusion: This study demonstrates the positive effect of OMT on sIgA levels in persons experiencing high stress. Results suggest that OMT may then have therapeutic preventive and protective effects on both healthy and hospitalized patients, especially those experiencing high levels of emotional or physiological stress and those at higher risk of acquiring upper respiratory tract infections.

Efficacy of osteopathic manipulation as an adjunctive treatment for hospitalized patients with pneumonia: A randomized controlled trial

Noll DR, Degenhardt BF, Morley TF, Blais FX, Hortos KA, Hensel K, Johnson JC, Pasta DJ, Stoll ST

Osteopathic Medicine and Primary Care

2010

Background: The Multicenter Osteopathic Pneumonia Study in the Elderly (MOPSE) is a registered, double-blinded, randomized, controlled trial designed to assess the efficacy of osteopathic manipulative treatment (OMT) as an adjunctive treatment in elderly patients with pneumonia.

Methods: 406 subjects aged ≥ 50 years hospitalized with pneumonia at 7 community hospitals were randomized using concealed allocation to conventional care only (CCO), light-touch treatment (LT), or OMT groups. All subjects received conventional treatment for pneumonia. OMT and LT groups received group-specific protocols for 15 minutes, twice daily until discharge, cessation of antibiotics, respiratory failure, death, or withdrawal from the study. The primary outcomes were hospital length of stay (LOS), time to clinical stability, and a symptomatic and functional recovery score.

Results: Intention-to-treat (ITT) analysis ($n = 387$) found no significant differences between groups. Per-protocol (PP) analysis ($n = 318$) found a significant difference between groups ($P = 0.01$) in LOS. Multiple comparisons indicated a reduction in median LOS (95% confidence interval) for the OMT group (3.5 [3.2-4.0] days) versus the CCO group (4.5 [3.9-4.9] days), but not versus the LT group (3.9 [3.5-4.8] days).

Secondary outcomes of duration of intravenous antibiotics and treatment endpoint were also significantly different between groups ($P = 0.05$ and 0.006 , respectively). Duration of intravenous antibiotics and death or respiratory failure were lower for the OMT group versus the CCO group, but not versus the LT group.

Conclusions: ITT analysis found no differences between groups. PP analysis found significant reductions in LOS, duration of intravenous antibiotics, and respiratory failure or death when OMT was compared to CCO. Given the prevalence of pneumonia, adjunctive OMT merits further study.

The immediate effect of individual manipulation techniques on pulmonary function measures in persons with chronic obstructive pulmonary disease

Noll DR, Johnson JC, Baer RW, Snider EJ

Osteopathic Medicine and Primary Care

2009

Background: The use of manipulation has long been advocated in the treatment of chronic obstructive pulmonary disease (COPD), but few randomized controlled clinical trials have measured the effect of manipulation on pulmonary function. In addition, the effects of individual manipulative techniques on the pulmonary system are poorly understood. Therefore, the purpose of this study was to determine the immediate effects of four osteopathic techniques on pulmonary function measures in persons with COPD relative to a minimal-touch control protocol.

Methods: Persons with COPD aged 50 and over were recruited for the study. Subjects received five, single-technique treatment sessions: minimal-touch control, thoracic lymphatic pump (TLP) with activation, TLP without activation, rib raising, and myofascial release. There was a 4-week washout period between sessions. Protocols were given in random order until all five techniques had been administered. Pulmonary function measures were obtained at baseline and 30-minutes posttreatment. For the actual pulmonary function measures and percent predicted values, Wilcoxon signed rank tests were used to test within-technique changes from baseline. For the percent change from baseline, Friedman tests were used to test for between-technique differences.

Results: Twenty-five subjects were enrolled in the study. All four tested osteopathic techniques were associated with adverse posttreatment changes in pulmonary function measures; however, different techniques changed different measures. TLP with activation increased posttreatment residual volume compared to baseline, while TLP without activation did not. Side effects were mild, mostly posttreatment chest wall soreness. Surprisingly, the majority of subjects believed they could breathe better after receiving osteopathic manipulation.

Conclusion: In persons with COPD, TLP with activation, TLP without activation, rib raising, and myofascial release mildly worsened pulmonary function measures immediately posttreatment relative to baseline measurements. The activation component of the TLP technique appears to increase posttreatment

residual volume. Despite adverse changes in pulmonary function measures, persons with COPD subjectively reported they benefited from osteopathic manipulation.

Clinical and research protocol for osteopathic manipulative treatment of elderly patients with pneumonia

Noll DR, Degenhardt BF, Fossum C, Hensel K

The Journal of the American Osteopathic Association

2008

Pneumonia in elderly patients is a major public health concern because of greater morbidity and mortality and longer hospital stays relative to younger populations. Based on the premise that osteopathic manipulative treatment (OMT) is beneficial in the management of pulmonary infections, the Multicenter Osteopathic Pneumonia Study in the Elderly (MOPSE) was designed as a prospective randomized controlled trial to evaluate the efficacy of OMT as an adjunct to the current pharmacologic treatment of elderly patients hospitalized for pneumonia. The protocol developed for MOPSE has its origins in early osteopathic medical literature at a time when effective antibiotic therapy was unavailable and osteopathic physicians relied on physical examination and empiric reasoning to develop treatment strategies and OMT techniques to improve host defenses against pneumonia. The present paper reviews the early osteopathic medical literature to identify the reasoning behind the OMT techniques that are the basis for the design of the MOPSE protocol. Likewise, the contemporary medical literature relevant to the protocol is reviewed. Finally, a description of the study design and the OMT and light touch (sham) protocols used in MOPSE are provided.

The effect of osteopathic manipulative treatment on immune response to the influenza vaccine in nursing homes residents: A pilot study

Noll DR, Degenhardt BF, Stuart MK, Werden S, McGovern RJ, Johnson JC

Alternative Therapies in Health and Medicine

2004

Abstract Not Included

Effectiveness of a sham protocol and adverse effects in a clinical trial of osteopathic manipulative treatment in nursing home patients

Noll DR, Degenhardt BF, Stuart M, McGovern R, Materson M

The Journal of the American Osteopathic Association

2004

Abstract Not Included

Lymphatic pump techniques induce a transient basophilia

Hampton D, Evans R, Banihashem M

4th International Conference for Advances in Osteopathic Research

2003

Introduction: The significance of lymphatic pump in osteopathic manipulative treatment (OMT) is well recognized, especially in the management of respiratory infections. We have previously demonstrated the occurrence of a transient basophilia following lymphatic pump techniques in a group of 12 male medical school students.

Methods: In a follow up study, twelve male medical students at LECOM between ages of 20 to 35 years volunteered to be subjects for the study. These participants were informed in advance of the purpose of the study and nature of physiologic outcome. Each one gave his informed consent. Criteria for admission to the study included a negative history of acute or chronic infection, thoracic or abdominal surgery (except appendectomy), EBV (EpsteinBarr virus) infection within the last 18 months, abdominal trauma, or any hematologic or lymphatic disease. The subjects were randomly divided into two groups. Six subjects in Group I were given splenic pump for one minute followed by pectoral traction for three minutes. Six subjects in Group II did not receive the manipulative techniques and thus, served as controls. Five ml of venous blood was collected from subjects in Group I prior to the manipulation and at 15 minutes, 1 hour, and 2 hours post-manipulation. The same schedule of blood collection was followed in the control subjects in Group II except that no manipulation was performed.

Results: Differential blood cell count showed no basophilia in any of the control subjects at any of the time points studied. However, five of the six subjects in Group I showed basophilia following manipulation.

Conclusions: Although further studies are needed to fully elucidate the mechanism of basophilia, our results support our previous finding that splenic pump and pectoral traction techniques may be associated with basophilia

Thoracic lymphatic pumping and the efficacy of influenza vaccination in healthy young and elderly populations

Breithaupt T, Harris K, Ellis J, Purcell E, Weir J, Clothier M, Boesler D

The Journal of the American Osteopathic Association

2001

The authors investigated whether thoracic lymphatic pumping (TLP) after FluShield vaccination enhanced the production of anti-influenza immunoglobulins in elderly individuals, who are at particular risk for influenza. Osteopathic students and non-TLP-treated elderly subjects served as controls. Serum antibody titers were quantified with enzyme-linked immunosorbent assay, and hemagglutination inhibition assay, both of which generated comparable results. While approximately 70% of the younger controls had increased anti-influenza immunoglobulin production on vaccination, only 30% to 35% of the aged population had increased antibody production. There was no significant enhancement in anti-influenza immunoglobulin production in the TLP-treated subjects.

The authors' findings suggest that TLP in conjunction with influenza vaccination does not enhance immunization against influenza in otherwise healthy and active populations. However, such techniques may be of value when applied in conjunction with vaccination to nonambulatory patients or on actual influenza exposure of at-risk individuals.

Benefits of osteopathic manipulative treatments for hospitalized elderly patients with pneumonia

Noll DR, Shores JH, Gamber RG, Herron KM, Swift J

The Journal of the American Osteopathic Association

2000

While osteopathic manipulative treatment (OMT) is thought to be beneficial for patients with pneumonia, there have been few clinical trials—especially in the elderly. The authors' pilot study suggested that duration of intravenous antibiotic use and length of hospital stay were promising measures of outcome. Therefore, a larger randomized controlled study was conducted. Elderly patients hospitalized with acute pneumonia were recruited and randomly placed into two groups: 28 in the treatment group and 30 in the control group. The treatment group received a standardized OMT

protocol, while the control group received a light touch protocol. There was no statistical difference between groups for age, sex, or simplified acute physiology scores. The treatment group had a significantly shorter duration of intravenous antibiotic treatment and a shorter hospital stay.

Adjunctive osteopathic manipulative treatment in the elderly hospitalized with pneumonia: A pilot study

Noll DR, Shores J, Bryman PN, Masterson EV

The Journal of the American Osteopathic Association

1999

To evaluate the benefit of osteopathic manipulative treatment in the elderly with pneumonia, the authors recruited 21 individuals older than 60 years who were hospitalized with acute pneumonia. Eleven patients were randomly assigned to the treatment group and ten to the control group. The treatment group received specific osteopathic manipulative treatment for somatic dysfunction and a standardized treatment protocol. Both groups received conventional therapy, and the attending physician was blind to group assignments. No significant difference existed between groups for age, sex, or severity of illness. Although the mean duration of leukocytosis, intravenous antibiotic treatment, and length of stay were shorter for the treatment group, these measures did not reach statistical significance. However, the mean duration of oral antibiotic use did reach statistical significance at 3.1 days for the treatment group and 0.8 day for the control group. Osteopathic manipulative treatment may reduce antibiotic use and length of stay; however, a larger study is needed to clarify this outcome.

Transient basophilia following the application of lymphatic pump techniques: a pilot study

Mesina J, Hampton D, Evans R, Ziegler T, Mikeska C, Thomas K, Ferretti J

The Journal of the American Osteopathic Association

1998

Lymphatic pump techniques (LPTs) consisting of pectoral traction and splenic pump were performed on seven male medical students following blood collection for baseline value determinations. Blood was collected from each subject at 15, 30, 60, 120, and 240 minutes post-LPT. The samples were analyzed for serum chemistry and complete blood cell count. All subjects showed an increase in the percentage of basophils. There was variation in the time points for the initial occurrence of basophilia among the subjects. A separate cohort of five male medical students served as control subjects. The control group did not receive LPTs. Blood samples collected at the same time points as the experimental group did not show the basophilia.

Effect of lymphatic and splenic pump techniques on the antibody response to hepatitis B vaccine: a pilot study

Jackson KM, Steele TF, Dugan EP, Kukulka G, Blue W, Roberts A

The Journal of the American Osteopathic Association

1998

Osteopathic manipulative treatment (OMT) facilitates the movement of lymphatic fluid and may enhance the immunologic response to infection or injected antigen. In this investigation, two groups of volunteers were vaccinated with recombinant hepatitis B vaccine, given at 0, 5, and 25 weeks. The experimental group (n = 20) received OMT (lymphatic and splenic pump) three times per week for 2 weeks after each vaccination. Control subjects (n = 19) received vaccine but no OMT. Resultant serum antibody levels were measured by enzyme immunoassay. Fifty percent of subjects in the treatment

group achieved protective antibody titers (≥ 10 mIU/mL) on the 13th week with an average titer of 374 mIU/mL. Only 16% of the control subjects had positive antibody responses, with average titers of 96 mIU/mL. At all time points from week 6 on, the average anti-hepatitis B titer was higher in the treatment group than in the control group. These data suggest an enhanced immunologic response in subjects who received OMT.

The effect of the lymphatic pump on the B and T cells in peripheral blood

Measel JW, Kafity AA

The Journal of the American Osteopathic Association

1986

In order to assess the effectiveness of the lymphatic pump technique on peripheral blood bone marrow (B) and thymic (T)-derived cells, 21 medical students were utilized in a double blind manner. The students were randomly divided into an experimental group which received the lymphatic pump and a control group which did not. Both groups were bled at the same time during the experiment and at 24 hours. Subsequently, complete blood counts were performed and lymphocytes were stained with 81 and T11 monoclonal antibodies. These cells were examined by flow cytometry using an EPICS V flow cytometer. The cells were electronically gated on forward vs. 90° light scatter, and the percentage of fluorescent-positive cells were counted/10,000 lymphocytes. Results indicate that white cell counts rose from 7,460/111 pretest to 9,810 post-test and lymphocyte numbers decreased from 47.6 percent pretest to 43.7 percent post-test. The T cells rose from 73.2 percent to 80.9 percent while the B cells rose from 5.07 percent to 9.25 percent. These preliminary data indicate a significant change in the peripheral blood of persons who receive the lymphatic pump.

Interferon levels in human subjects throughout a 24-hour period following thoracic lymphatic pump manipulation

Paul RT, Stomel RJ, Broniak FF, Williams Jr, BB

The Journal of the American Osteopathic Association

1986

This study was undertaken to determine whether interferon, an antiviral and antibacterial agent, could be released or induced by thoracic lymphatic pump manipulation. After complete history taking and physical examination, 12 healthy adults were studied. The subjects were taking no medications and had had no known viral or bacterial infections for at least 2 weeks. The technique was performed by experienced osteopathic physicians for 5 minutes. Control serum was drawn prior to treatment, and subsequent samples were obtained at 0.25, 1, 1.5, 2, 3, 4, 6, 8, 12, and 24 hours post-treatment. The blood samples were centrifuged immediately, and the sera were frozen at -70°C . Utilizing vesicular stomatitis virus on a monolayer of human fibroblast cells, interferon levels were determined by a reduction of cytopathic effect. Mean post-treatment serum interferon levels were statistically compared with mean pretreatment values using the analysis of variance method. No statistically significant differences were observed between any of the 10 post-treatment groups and the pretreatment group.

The effect of the lymphatic pump on the immune response: I. Preliminary studies on the antibody response to pneumococcal polysaccharide assayed by bacterial agglutination and passive hemagglutination

Measel JW

The Journal of the American Osteopathic Association

1982

The effect of the lymphatic pump on the immune response of normal male medical students by two serologic tests to pneumococcal polysaccharide was investigated. Analysis of serum from experimental and control groups indicated that the lymphatic pump (experimental) group had a greater immune response, which was statistically different from that of the control on the basis of testing for polysaccharide 1, 3, 4, 6, 8, 14, 23, 25, and 56 by passive hemagglutination. The same increased immune response was seen on tests of bacterial strains 4, 6, and 8 assayed by bacterial agglutination. This study suggests that the lymphatic pump has some effect on the immune system.

The use of the thoracic pump in treatment of lower respiratory tract disease

Allen TW, Pence TK

The Journal of the American Osteopathic Association

1967

This paper reports the results of a controlled study to determine the efficacy of the thoracic pump in diseases of the lower respiratory tract. Sixteen hospitalized patients with lower respiratory tract diseases were given accepted therapy for their particular condition. Six of these patients, selected at random, were given chest physical therapy in the form of the thoracic pump in addition to the standard therapy. An increase in vital capacity was shown by 5 of these 6 subjects 5 days after the initiation of therapy, and none had a decrease. In the control group 6 demonstrated an increase in vital capacity, 3 had a decrease, and 1 had no change. Both groups showed improvement in other pulmonary function test results. The use of the thoracic pump was associated with a more rapid cleansing of the tracheobronchial tree, greater production of sputum, and a shorter duration of cough.

Osteopathic manipulative therapy, antibiotics, and supportive therapy in respiratory infections in children: Comparative Study

Kline CA

The Journal of the American Osteopathic Association

1965

Two hundred and fifty-two children had been hospitalized over a period of 18 months for conditions such as pneumonia, tracheobronchitis, bronchitis, bronchiolitis, tonsillitis, influenza, nasopharyngitis, and general upper respiratory infections. All patients received supportive therapy. In addition one group received manipulative therapy; one, antibiotics without manipulation; and one, a combination of the two. The groups receiving other treatment with or without manipulative therapy recovered more quickly than the group treated only by manipulation.