

An investigation into the effect of Cupping Therapy as a treatment for Anterior Knee Pain and its potential role in Health Promotion. –

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Citation: K. Ullah, A. Younis, M. Wali: An investigation into the effect of Cupping Therapy as a treatment for Anterior Knee Pain and its potential role in Health Promotion.. *The Internet Journal of Alternative Medicine*. 2007 Volume 4 Number 1. DOI: 10.5580/796 –
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Abstract

Objective: To investigate the effect of Cupping Therapy at a patho-physiological level for anterior knee pain and its impact on Quality of life and well-being. **Method:** Experimental survey utilising clinical trial and a questionnaire. A three week follow-up was conducted to determine longer term carryover of treatment effects utilising both objective and subjective assessment. This method enables the researcher to examine how much the independent variable causes participants to change (Dane, 1990). **Results:** There was statistically significance difference between the level of pain, well being and Range of Motion for patients with anterior knee pain pre and post Cupping ($P < 0.05$). **Conclusions:** The efficacy of the treatment of Cupping Therapy for Anterior Knee Pain, well being and range of motion has been researched and results reveal improvements in participants as a result of Cupping Therapy. It is recommended that further studies are conducted with larger study samples and of longer duration.

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Introduction

Cupping is an ancient method of treatment that has been used in the treatment and cure of a broad range of conditions; blood diseases such as haemophilia and hypertension, rheumatic conditions ranging from arthritis, sciatica, back pain, migraine, anxiety and general physical and mental well-being. The aim of Cupping is to extract blood that is believed to be harmful from the body which in turn rids the body of potential harm from symptoms leading to a reduction in well-being.

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History and origins of Cupping Therapy

Traditionally, Cupping Therapy has been practiced in most cultures in one form or another. In the UK the practice of Cupping Therapy also dates back a long way with one of the leading medical journals 'The Lancet' being named after this practice. A lancet is a piece of surgical equipment that was traditionally utilised to release excess blood i.e. venesection and to prick boils. The Arabic name for Cupping Therapy is Al-Hejamah which means to reduce in size i.e. to return the body back to its natural state. The practice of Al-Hejamah has been part of Middle-Eastern cultural practice for thousands of years with citations dating back to the time of Hippocrates (400 BC). Of the western world, the first to embrace Cupping Therapy were the ancient Egyptians, and the oldest recorded medical textbook, Ebers Papyrus, written in approximately 1550 BC in Egypt mentions cupping (Curtis, 2005). Cupping Therapy can be divided into two broad categories: Dry Cupping and Wet Cupping. Dry Cupping Therapy tends to be practiced more commonly in the Far-East whereas Wet Cupping is favoured in the Middle East and Eastern Europe. For the purpose of this research Wet Cupping Therapy will be investigated and the referred to as Cupping Therapy.

Current use of Cupping Therapy

Complementary and Alternative Medicine (CAM) is becoming more popular with the public and gaining credibility within biomedical health care (Hill, 2003). Surveys show that approximately one third of the UK's population (Ernst, 1996) and slightly higher in the USA (Wootton and Sparber, 2001) have used CAM. Additionally, mainstream healthcare, whilst requesting further evidence for CAM, are increasingly interested in some forms of CAM (Hoffman, 2001).

Medical effects of Cupping Therapy

According to Hennawy (2004), Cupping Therapy is indicated for blood disorders, pain relief, inflammatory conditions, mental and physical relaxation, varicose veins and deep tissue massage and quotes up to 50% improvement in fertility levels.

The principles of Acupuncture and Acupressure are very similar to that of Wet Cupping Therapy, except for the fact that Wet Cupping involves the letting of blood whereas Acupuncture and Acupressure utilise suction and stimulation of points to attain the desired results. Letting out blood is in fact among the oldest of acupuncture techniques (Dharmananda, 2004). It is speculated that acupuncture started as a method of pricking boils of the skin, then expanded to letting out “bad blood” that was generated by injuries or fevers and finally allowing invisible evil spirits and perverse atmospheric qi (most notably “wind”) escape from the body (Unschuld, 1985).

Focussing attention back to the research into Chinese healing traditions, the discovery of Acupressure and Acupuncture analgesia has proved that they can elicit the release of morphine like substances (Endorphins), Serotonin or Cortisol which can ultimately lead to pain relief and alter the physiological status of the individual (Schulte, 1996). Acupressure and Acupuncture in fact are being utilised and proven useful in pain and addictive management (Schulte, 1996; Hinze, 1988; Cadwell, 1998). At a biological level; Acupressure and Acupuncture work by stimulating or activating (1) the immune system; (2) Enkephalin secretion; (3) neurotransmitter release (4) vasoconstriction and dilatation and (5) the gates for pain in the CNS which interpret pain sensation (NIH Consensus Development Panel, 1998; Schulte, 1996). Finally, it is believed that stimulation of Acupoints can lead to the pain gates to be overwhelmed by increasing frequency of impulses, therefore ultimately leading to closure of the gates and hence pain reduction (Oumeish, 1998; Cadwell, 1998).

According to the National Institute of Health (NIH) Consensus Development Panel (1997), acupuncture is also effective against chemotherapy nausea and vomiting, nausea in pregnancy, dental pain, adjunct therapy, addiction, stroke rehabilitation, headache, menstrual cramps, tennis elbow, fibromyalgia, low back pain, carpal tunnel syndrome, asthma and so forth (Lee, 2001). Given the relative low cost of CAM in general, integration of therapies into mainstream healthcare delivery will no doubt lighten the financial and time burden on our healthcare system.

As Cupping Therapy has been proposed as an effective treatment for pain and given the similarities with Acupuncture and Acupressure theory, it is possible to therefore accept the above mechanism of biological action for Cupping Therapy for pain reduction as well.

Anterior Knee Pain and Cupping Therapy

It is well established that knee injuries are the most common serious injury during sporting activities (Johnson, 2005). The potential for Cupping Therapy to treat anterior knee pain and its associated morbidity should be researched as mentioned earlier as the health and cost implications are indeed promising. It is proposed that Cupping Therapy alongside sound medical and physiotherapy advice for conditions such as Anterior Knee Pain will work well as research

has shown that conventional treatment of Anterior Knee Pain (AKP) with sound physiotherapy advice are effective tools in reducing levels of AKP as well as having benefits on individual well-being (Clark et al., 2000).

Cupping Therapy and the ethnic minority population

Britain's population is very diverse; the number of people classed as ethnic minorities is on the increase, (Commission for Racial Equality 1999). It is well established that the use of health care services by ethnic populations is disproportionate to that of the Caucasian population in the UK (Crespo et al., 2000) and also that physical inactivity is more prevalent among ethnic minorities than among Caucasians, (King et al 2000). Therefore an intervention such as Cupping Therapy may help to bridge the gap as did Acupuncture with Far-Eastern communities.

Contra-indications and Precautions to treatment

Cupping Therapy has no major side effects aside from minimal discomfort due to the method of application of skin cuts to the patient. In cases where the patient's pain threshold is low, a local anaesthetic can be administered. Also other possible minor side effects that may occur is the feeling of slight light headedness post Cupping Therapy, this again is similar to the sensation one feels after having had blood taken from the doctor, as Cupping Therapy encourages blood flow to the cupped region (hyperaemia), one may therefore feel warmer and hotter as a result of vasodilation taking place and slight sweating may occur. Again this can be attributed to sound scientific rationale and there is no cause for concern.

Pregnant women or menstruating women, cancer (metastatic) patients and patients with bone fractures or muscle spasms are also believed to be contra-indicated. Also, Cupping Therapy cannot be applied to a site of DVT, where there are ulcers, arteries or places where a pulse can be felt (Chirali, 1999,).

Aims of the research

The aim of the research:

- Evaluate the effect of Cupping Therapy on Anterior Knee Pain (AKP), Range of movement and its impact on quality of life and well-being.

Testable hypothesis

- Cupping Therapy has no effect on the perception of knee pain, Range of movement and well being

Methodology and research design

The method of this study was an experimental survey utilising clinical trial and a questionnaire methodology. A three week follow-up was conducted to determine longer term carryover of

treatment effects utilising both objective and subjective assessment. Measurements of subjects were taken pre- and post-test.

The research was designed after extensive literature review, discussion with cupping practitioners, observation of the application techniques, and discussion and communication with practitioners and centres involved in performing cupping (mainly in the Middle East). After that, the procedure for the application of cupping for this research was established (see cupping application procedure).

An assessment sheet (see appendix 1) was designed to include patient information, past and present medical history, vital signs measurements (pulse rate, blood pressure and O₂ saturation rate for monitoring purposes only). All measurements and questions were performed by the same researcher before and after cupping to enhance validity and reliability.

Outcome measures that were used were the Pain Visual Analogue Scale (Pain VAS), Well Being Visual Analogue Scale (Well Being VAS) and joint range of motion, both Active Range of Motion (AROM) and Passive Range of Motion (PROM). The independent variable in this study was the treatment of Cupping Therapy, which all participants received. The independent variables measured were Pain and Well-being VAS scales and Active and Passive Knee Ranges of Movement. The participants were also asked about their perception of cupping and general health and quality of life through a questionnaire. The questionnaire was designed carefully through integrating an array of generic qualitative approaches such as the World Health Organisation Quality of Life questionnaire (WHOQOL-100), EuroQol-5D (EQ-5D) and the 15D Health Related Quality of Life (15D); with the aim to develop a questionnaire specific to Cupping Therapy. Prior to the main study, the questionnaire was tested successfully in two pilot studies.

Population and Sampling

The target population for this investigation was the general public predominantly in the Greater London region and currently unaffiliated with any health trust using convenience sampling technique. Subjects were recruited utilising a range of advertising techniques including advertising on; a national radio station (Spectrum Radio 558 AM), university email system, a medical documentary TV show on ANN satellite channel (Arab News Network).

Inclusion Criteria

- Subjects with knee problems age between 20-80 years old.
- Subjects who did not receive cupping to the knee region before or to any other region of the body six months prior to the study.

Exclusion Criteria

- Infants
- Subjects suffering from serious heart troubles or diseases that render the individual prone to bleeding.

- Pregnant women
- Cancer patients
- Subjects with bone fractures or muscle spasms at the knee region.

Instrumentation

Basic Cupping therapy equipment was utilised including a hand suction pump, plastic cups of the same size and anti-septic tools.

Ethical consideration of the study

Patients were provided information sheets detailing the research procedure, subject understanding of the research was considered and a consent form was provided prior to commencing the study. Subjects wishing at anytime to withdraw from the study, or withhold any information were allowed to do so. Ethical approval was sought from Kings College Research Committee.

The procedure

The following procedure as used:

Prior to commencing application of treatment, we ensured that:

- The subjects had complied with the pre-cupping requirements (inclusion criteria).
- Contra-indications were eliminated
- Equipment was sterilised
- Subjects were reassured/reminded of minor side effects
- Subjects' blood pressure, pulse rate and O₂ saturation rate were measured in a sitting position, and then subjects were asked to identify the level of their pain using visual analogue scale in English (and also an Arabic translation was available, see appendix 1). Vital signs were taken only to monitor subject general condition.
- Knee observations were conducted for any abnormalities and then the knee range of motion was measured from a supine lying position by the same researcher.
- Subjects were interviewed by the same researcher.
- The cupping application was performed at the knee (lateral to the quadriceps tendon) utilising a razor for sterility purposes and control of depth and breadth of cuts. Cups were applied to the treatment region and the blood was carefully drained three times. The cupped region was managed as according to basic wound management procedures (i.e. antiseptics and gauze application)
- All measurements (blood pressure, pulse rate and O₂ saturation rate, knee range of motion as well as the pain and well being scales) were repeated by the same researcher immediately after cupping and then one, two and three weeks after cupping.

Data Analysis

The data was analysed using descriptive analysis in the form of minimum, maximum, mean, and Standard Deviation (SD). The paired sample t-test was employed to determine the difference between subjects before and after cupping.

The level of significance of this study was set at 5%. All data analysis was performed using Statistical Package for Social Sciences (SPSS) v.12 for Windows.

Results

Response Rate

A total of 26 volunteers consented to partake in the study. Four volunteers dropped out prior to the study commencing. Twenty two volunteers began the study; five volunteers did not attend any follow-up appointments therefore they were excluded from the study and two volunteers were unable to attend the final two appointments and the remaining 15 volunteers completed the study giving a participation rate of 57.69% (n=15). The constitution of the twenty two volunteers that began the study was as follows: male (n=20, 90.90%), female (n=2, 9.10%). All volunteers were above 18 years of age.

The difference between Passive and Active Ranges of Movement, Pain and Well Being scores before and after Cupping Therapy

The table below illustrates there was an increase in the mean both Active and Passive ranges of movement, as a reduction in pain scores and an increase in well-being. The Std. Deviation pre-Cupping for PROM was (M±SD) (142.64 ± 11.168), and three weeks post-cupping the Std. Deviation was (151.67 ± 5.96). Likewise for AROM the Std. Deviation pre-Cupping for AROM was (134.14 ± 16.53) and three weeks post-cupping the Std. Deviation was (147.24 ± 7.04). A similar trend can be seen for the pain and well being scores. The Std. Deviation pre-Cupping for Pain was (5.38 ± 2.8), and three weeks post-cupping the Std. Deviation was (1.29 ± 2.02). The Std. Deviation pre-Cupping for well-being was (7.21 ± 1.65), and three weeks post-cupping the Std. Deviation was (8.29 ± 1.20).

Measure	Mean	SD	Minimum	Maximum	N
Passive ROM before Cupping	142.64	11.168	115.00	155.00	22
Passive ROM immediately after Cupping	148.45	7.60	130.00	155.00	22
Passive ROM 1week after Cupping	150.67	7.18	131.00	155.00	15
Passive ROM 2weeks after Cupping	150.58	6.56	135.00	155.00	12
Passive ROM 3weeks after Cupping	151.31	5.96	133.00	155.00	13
Active ROM before Cupping	134.14	16.53	95.00	155.00	22
Active ROM immediately after Cupping	140.00	7.26	128.00	150.00	22
Active ROM 1week after Cupping	143.33	7.50	124.00	151.00	15
Active ROM 2weeks after Cupping	145.67	8.50	127.00	154.00	12
Active ROM 3weeks after Cupping	147.24	7.04	128.00	155.00	13
Pain (VAS) before Cupping	5.38	2.80	0.01	10.00	21
Pain (VAS) immediately after Cupping	0.73	1.52	0.01	6.00	22
Pain (VAS) 1week after Cupping	1.60	2.85	0.01	10.00	15
Pain (VAS) 2weeks after Cupping	1.77	2.22	0.01	5.00	13
Pain (VAS) 3weeks after Cupping	1.29	2.02	0.01	5.00	14
Well-being (VAS) before Cupping	7.21	1.65	2.00	9.00	15
Well-being (VAS) 1week after Cupping	8.13	1.13	5.00	10.00	13
Well-being (VAS) 2weeks after Cupping	8.00	1.29	5.00	9.00	11
Well-being (VAS) 3weeks after Cupping	8.29	1.20	5.00	10.00	14

Table 1: Showing the difference between Passive and Active Ranges of Movement, Pain and Well Being scores before and after Cupping Therapy

The significance of differences in subject scores before and after cupping

As we have seen from the above table there are noticeable differences in each outcome measure scores pre-Cupping and the follow-up sessions. The paired sample t-test was performed to ascertain the statistical significance difference between the pain scores, range of motion and well being: immediately after Cupping, 1 week after Cupping, 2 weeks after cupping and 3 weeks after Cupping.

Outcome measures tested	T	df	P value (2-tailed)
Passive ROM before Cupping - Passive ROM immediately after Cupping	-3.810	21	.001
Passive ROM before Cupping - Passive ROM 1week after Cupping	-3.651	14	.003
Passive ROM before Cupping - Passive ROM 2weeks after Cupping	-3.772	11	.003
Passive ROM before Cupping - Passive ROM 3weeks after Cupping	-4.064	12	.002
Active ROM before Cupping - Active ROM immediately after Cupping	-2.469	21	.022
Active ROM before Cupping - Active ROM 1week after Cupping	-2.199	14	.045
Active ROM before Cupping - Active ROM 2weeks after Cupping	-3.485	11	.005
Active ROM before Cupping - Active ROM 3weeks after Cupping	-3.457	12	.005
Pain (VAS) before Cupping - Pain (VAS) immediately after Cupping	6.711	20	.000
Pain (VAS) before Cupping - Pain (VAS) 1week after Cupping	5.241	13	.000
Pain (VAS) before Cupping - Pain (VAS) 2weeks after Cupping	5.272	11	.000
Pain (VAS) before Cupping - Pain (VAS) 3weeks after Cupping	6.222	12	.000
Well-being (VAS) before Cupping - Well-being (VAS) 1week after Cupping	-2.385	14	.032
Well-being (VAS) before Cupping - Well-being (VAS) 2weeks after Cupping	-2.309	12	.040
Well-being (VAS) before Cupping - Well-being (VAS) 3weeks after Cupping	-11.371	10	.000

Table 2: showing the significance of differences in subject scores before and after cupping

The table above shows that there is a statistically significance difference in Passive Ranger of Motion, Active Ranger of Motion, Pain Visual Analogue Scale and Well Being Visual Analogue Scale before and after Cupping Therapy; $p \leq 0.05$ in all outcome measures.

Discussion

Effect of Cupping Therapy on Ranges of Motion and Pain level reduction (Tables 1 and 2)

The level of pain perceived by the subjects post intervention was significantly lower than compared to pre-intervention. This can be viewed from table1 which shows difference between Passive and Active Ranges of Movement (ROM), Pain and Well Being scores before and after Cupping Therapy.

Looking at the pain scores similar changes can be seen as with the Ranges of Motion scores. The mean pain score had dropped from 5.14 to 1.26 after the third week. There was a considerable reduction in the levels of pain perceived and upon applying a paired sample t-test it was found that the difference in scores was statistically significant immediately after cupping, 1,2 and 3weeks post cupping also ($p < 0.05$). The results confirm that intervention to anterior knee pain

can lead to significant reductions in level of pain perceived by individuals (Clark et al, 2000). Also it is apparent that the maximum level of pain perceived by an individual reduced by 50% (from 10/10 to 5/10) at the end of the study. This is particularly important as Cupping Therapy has long been advocated as an effective form of pain relief (Cassileth, 2004 and Hennawy 2004). The results obtained from this study complement propositions made by many cupping practitioners worldwide.

It can be seen that both active and passive ranges improved considerably post cupping. The mean AROM pre cupping was 134.14degrees with the minimum ROM being 95degrees. The mean scores had increased to 143degrees 1week post cupping and the minimum score had increased to 124degrees. By the third week, the mean score had increased to 147.24degrees and the minimum score had increased 128degrees. Upon applying a paired sample t-test it was found that the difference in scores was statistically significant immediately after cupping, 1,2 and 3weeks post cupping also ($p < 0.05$). Likewise, statistically significant differences are also observed with the PROM. Therefore it can be said that cupping therapy significantly improves both active and passive ranges of movement.

The reductions in pain scores can be attributed to sound rationale as cupping therapy can elicit the release of morphine like substances (Endorphins), Serotonin or Cortisol which can ultimately lead to pain relief and alter the physiological status of the individual (Schulte, 1996). Acupressure and Acupuncture in fact are being utilised and proven useful in pain and addictive management (Schulte, 1996; Hinze, 1988; Cadwell, 1998). At a biological level like Acupressure and Acupuncture, Cupping Therapy works by stimulating or activating (1) the immune system; (2) Enkephalin secretion; (3) neurotransmitter release (4) vasoconstriction and dilatation and (5) the gates for pain in the CNS which interpret pain sensation (NIH Consensus Development Panel, 1998; Schulte, 1996). Finally, it is believed that stimulation of Cupping points can lead to the pain gates to be overwhelmed by increasing frequency of impulses, therefore ultimately leading to closure of the gates and hence pain reduction (Oumeish, 1998; Cadwell, 1998).

The impact of Cupping Therapy Well-Being (Tables 1 and 2)

It is not possible to truly quantify the true impact an intervention like Cupping Therapy has on the life of an individual. A qualitative approach towards understanding the impact from a patient's perspective is perhaps a more accurate interpretation with respect to the general impact. However, an analogue scale similar to the Pain VAS was used to quantify the perceived impact of cupping therapy on subject well being. The mean well-being VAS scores had increased from 7.21 to 8.23; an overall increase of more than 1. The increase in well-being scores was maintained throughout the study therefore reflecting the idea that Cupping Therapy has a positive impact on well-being. This finding is supported by the paired sample t-test ($p = \leq 0.05$). Hennawy (2004) supports this finding also.

It is therefore reasonable to stipulate that the biological benefits of cupping therapy in conjunction with the psychological uses of cupping collectively induce a feeling of physical and psychological well being.

Conclusion

It is not for the purpose of an exploratory piece of work like this to implement changes in healthcare practice. Rather the aim being to investigate and raise awareness of a procedure and to address issues of importance associated with it. The efficacy of the treatment of Cupping for Anterior Knee Pain, Range of Movement and well being has been researched and results reveal statistically significant differences in support of Cupping Therapy. It is also suggested that as an intervention, Cupping Therapy needs to be regulated and a register of practitioners developed. Longer term studies related to the effects of Cupping Therapy need to be conducted for other musculo-skeletal conditions.

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Appendices

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Patient Information Sheet

Dear Sir/madam

Thank you for agreeing to participate in our research project. This sheet is designed only to inform you about the procedures that we will apply and the purpose of this study.

Cupping is a very ancient technique used in many traditional cultures. Gaeta, (2004) says, "It brings fresh blood to the area so it tends to improve circulation. Most commonly it is used for aches and pains of various types as well as respiratory (chest) problems, cough, wheezing, things like that".

To date there is no scientific research that can prove these claims. It is hoped that this research will form the platform in order for practitioners to be able to verify the above by investigating the potential of this treatment.

On the day: we will begin by asking you some simple questions about your health, previous experience and views of cupping. Then we will do simple medical and physiotherapy examinations of your knee to determine your range of movement and current pain levels before cupping. These readings will be compared to the readings after cupping. Once the Cupping procedure is applied to the knee we will finish by asking you some more simple questions about your reactions to the technique.

Finally, we will arrange for you to attend 3 follow-up appointments (1, 2 and 3 weeks post treatment). In these sessions no treatment will be administered, we will only do the simple physiotherapy and medical examinations. The whole procedure will be no longer than one hour.

We would like to remind you that all information obtained from you shall strictly remain confidential. If you wish at anytime to withdraw from this study, or withhold any information, your wishes shall be respected. All treatment you receive in this study is free of charge. Although the study is being conducted at St Georges Hospital, the hospital has no obligation over you. Should there be any problems/queries, please feel free to contact myself (Kaleem Ullah) or Dr. Ahmed Younis at anytime.

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Thank you again for your invaluable contribution.

Appendix 1

Appendix 2: Assessment pack

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