

MEDICAL CUPS AND THEIR THERAPEUTIC USE

BAŃKI MEDYCZNE I ICH TERAPEUTYCZNE ZASTOSOWANIE

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zebranie danych
C. Data analysis/statistics
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D. Data interpretation
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Summary

Cupping therapy belongs to methods of natural medicine. Cups have been used since ancient times, with the first mentions of cups coming from excavations in Mesopotamia dating to around 3300 BC. The primary mechanism of cup action is related to blood function, known as autohemotherapy. The aim of this work was to present the different types of medical cups used today, techniques for placing them on the skin and their mechanisms of action for various medical conditions as well as in regenerative sports medicine and cosmetology. Methods of placing cups on the skin depend on the type of cup used, the purpose for which they are being used for and the experience level of the therapist. Cupping is a safe form of therapy support, provided that the treatments are performed according to a strictly established procedure and take into account contraindications. This work is a review based on a query of the literature on the subject, as well as the experience and results of research studies conducted by the authors. An important component of the work involves the demonstration of the use of cups as part of physiotherapeutic procedures and regimens using manual therapy (mobilization) and acupuncture points. The discussion presents a review of publications that highlight the therapeutic effects of cup use for various pathological conditions. The therapeutic effects of medical cups largely depend on several factors, mainly vacuum pressure, but also skin temperature under the cup and other forms of energy/indicators, which depend on the specific elements or components involved in the cupping procedure (i.e. heat, acupuncture needles).

Keywords: cupping therapy, manual therapy, acupuncture points, vacuum therapy

Streszczenie

Terapia z wykorzystaniem baniek należy do metod medycyny naturalnej. Bańki wykorzystywane były już w starożytności, pierwsze wzmianki o bańkach pochodzą z wykopalisk odkrytych w Mezopotamii ok. 3300 roku p.n.e. Główny mechanizm działania baniek związany jest z funkcją krwi – autohemoterapią. Celem pracy było przedstawienie wykorzystywanych współcześnie typów baniek lekarskich, technik ich stawiania oraz mechanizmów działania w odniesieniu do różnych stanów chorobowych, a także w odnowie biologicznej sportowców i kosmetologii. Sposoby stawiania baniek zależą od ich typu, przeznaczenia i doświadczenia terapeuty. Stawianie baniek jest bezpieczną formą wspomagania terapii pod warunkiem, że zabiegi są wykonywane według ściśle ustalonej procedury i z uwzględnieniem przeciwwskazań. Praca ma charakter przeglądu narracyjnego dokonanego na podstawie kwerendy światowej literatury przedmiotu oraz doświadczeń i rezultatów eksperymentów badawczych przeprowadzonych przez autorów pracy. Ważną składową pracy jest ukazanie zastosowania baniek w algorytmie postępowania fizjoterapeutycznego z wykorzystaniem środków terapii manualnej (mobilizacji) i punktów akupunktury. W dyskusji dokonano przeglądu publikacji dotyczących efektów terapeutycznych stosowania baniek w różnych stanach patologicznych organizmu. Można stwierdzić, że efekty terapeutyczne baniek lekarskiej zależne są od kilku czynników, głównie podciśnienia, ale także od temperatury skóry pod bańką i innych postaci energii w zależności od zastosowanego czynnika fizycznego (np. ciepło, igły akupunktury).

Słowa kluczowe: bańki lekarskie, terapia manualna, punkty akupunktury, terapia vacuum

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Introduction

Doctors and physiotherapists remain on the lookout for effective methods of rehabilitation after injury or sickness, and in regenerative sports medicine. Despite medical advances in these areas, the search for optimal approaches to treat pain and illness has been a major focus since the dawn of human civilizations, and will more than likely continue into the near and far future. Modern or conventional medicine, which is typically based on academic or evidence-based medicine, underestimates the methods of natural medicine [1]. Evidence for this comes from the fact that these methods are not taught at medical universities, and that there are no official treatments from the discipline included in services provided by health care systems in Europe (in Poland, the official health care system is the National Health Fund).

Natural medicine methods, also referred to as alternative or unconventional, include, among others: osteopathy, chiropractic, reflexotherapy based on various theoretical assumptions, including traditional Chinese medicine (TCM) with its various techniques (acupuncture, acupressure, moxa, etc.), bioenergy, hirudotherapy, as well as cupping therapy. The literature contains significant evidence demonstrating the therapeutic effectiveness of these methods [2-4]. Treatments in modern medicine are mainly drug-based, and as a result, the pharmaceutical industry has, and continues to grow at an unprecedented scale. It is worth recalling here the famous maxim spoken by Hippocrates (460-377 BC) – “Primum non nocere” (“First, do no harm”). This maxim was addressed to doctors, with the thought referring to overestimating the action of drugs in the treatment of diseases on the one hand, while underestimating the forces of nature in the process of recovery on the other.

Aim of the work

The aim of this work was to present an overview of medical cups used today in cupping therapy, the techniques for placing cups on the skin and the mechanisms of action in various medical conditions as well as regenerative sports medicine and cosmetology. This work is a review based on a query of the scientific literature, as well as the authors' extensive experience around the use and popularization of cups, including some of their own experiments and research.

A brief history of cupping therapy

There is a significant amount of evidence showing that vacuum cups have been used therapeutically since ancient times. The first mentions of cups come from excavations in the region of Mesopotamia that date back to about 3300 BC [5]. Cupping methods were known for many centuries during those times in various parts of the world. The ancient Greeks considered the god Telesphorus, son of Asclepius, as the patron of cups. They were used and described by medical celebrities such as Hippocrates (460-377 BC), Galen (130-200 AD), Avicenna (980-1037), Paracelsus (1493-1541) and Paré (1509-1590). In Greece, the cup was the emblem of prominent doctors. The cups were made of different materials: animal horns, bamboo, ceramics, brass and bronze; they were spherical or bell-shaped and had different sizes. Glass cups appeared around 100 BC, when the Syrians invented blown glass [6]. In Poland, the first description of cups can be found in work by Stefan Falimirz called “Herbarium” (1534), which includes rules for their use and drawings showing where they should be placed [7].

In the long history of cup usage for medicinal purposes, its mechanism of action and effectiveness have almost always been associated with blood (autohemotherapy). Blood is a type of connective tissue, performing many specific functions that are critical for the proper functioning of the human body. Hemotherapy included, apart from cupping, both dry and wet (i.e. bloody) approaches, as well as leeching (hirudotherapy) and Carl Brunscheidt therapy (1809-1860).

Components of cups and mechanisms of action

The basis of cup action is the mechanical creation of vacuum pressure. Depending on the level (i.e. power) of the created vacuum pressure, the cups can be divided into: light 100-300 mbar, medium 300-500 mbar and strong above 500 mbar [6].

Heat is another physical element that can be incorporated into the function and action of a cup. In a fire cup (so-called “hot”), the temperature of the skin – depending on the placement technique used – is 10.1% to 19.8% higher than normal body temperature (36.6°C) [7]. Due to this, “hot (fire) cups” may have greater healing value than cold ones. Depending on the type of cup, there are other components or elements that can be included such as additional heat (hot water or warm herbal stamps), the acupressure effect, which is related to the impact on

acupuncture points, or magnetic field energy, as in “Haci” type cups. Overall, the physical factors involved in vacuum therapy are associated with the following physiological reactions and mechanisms in the body [2]:

- a) the skin under the cup becomes hyperemic and blood extravasation occurs, which is comparable to the effects of autohemotherapy;
- b) there is irritation of numerous nerve endings (receptors) in the skin, which can lead to reflex actions from a specific dermatome, which affects the functioning of internal organs;
- c) metabolism is accelerated;
- d) the immune system is strengthened through production of a large number of immune bodies;
- e) detoxification of the body takes place;
- f) the process of phagocytosis is accelerated.

Types of cups and their use

Today, the following types of cups are generally used: fire glass, cold glass, bamboo, rubber (Chinese), silicone, acupuncture (Figure 1).



Figure 1. Types of cups: a – fire glass, b – bamboo, c – cold glass, d – rubber (Chinese), e – silicone (transparent), f – acupuncture, g – accessories for placing cold and acupuncture cups

Fire cupping

You can place a fire cup on the body in many ways. In our study procedure, a burning cotton ball that was previously soaked in spirit is placed into a clean and dried cup and after 2-3 seconds, we quickly attach it to the

body (Figure 2a and b). Another variation of the technique involves smearing the cup walls with spirit, setting it on fire and placing it quickly on the skin.

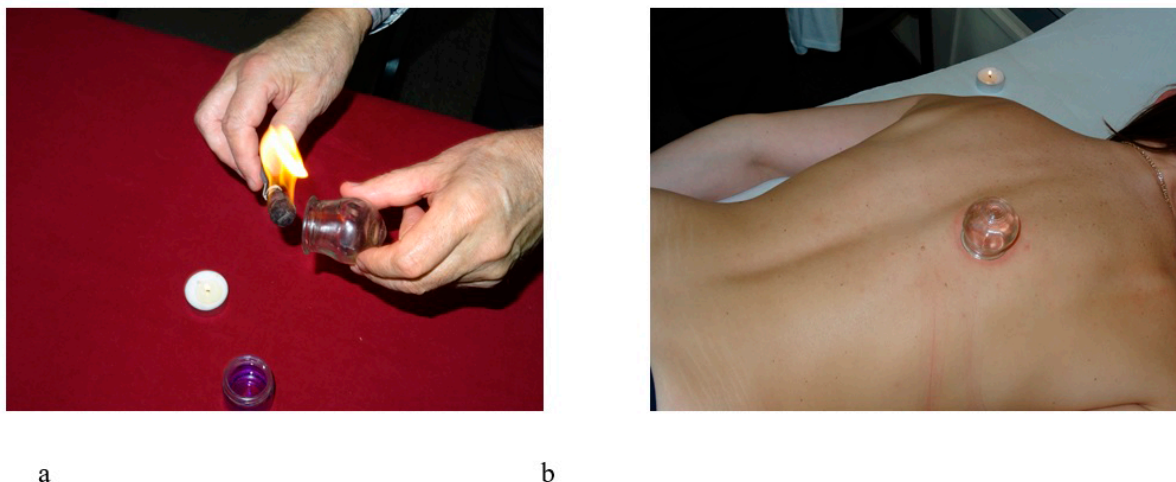


Figure 2. Fire cupping: a – cup preparation phase, b – placing phase

Antibiotic cup

The goal of this method is to replace the use of antibiotics and involves placing cups mainly on the torso (chest or back) [7]. It is mainly used to treat respiratory diseases, most often pneumonia and bronchitis. The cups remain on the body for about 15-20 minutes under a blanket or towel. The treatment is performed once and can be done with only one cup, but a labile one (movable), i.e. using a lubricant that is neutral or, even better, that supports the therapy such as an ointment or gel. In order to obtain the “antibiotic” cup effect, a cold cup can also be used.

Stationary (retained) cupping

Stationary (retained) cupping or labile (moving) cupping are used topically in order to induce a strong tissue reaction to cause rapid regeneration of functionally changed tissues. For this, both fire and cold cups are used. This form of cupping is used at a later stage of rehabilitation for muscular-tendon injuries and in damage to periarticular structures including bruises, sprains and subluxations of joints.

Acupuncture cupping

This technique involves cold cups with a “nail” (“clavicule”) placed inside, which – after sucking the air – exert pressure on the acupuncture point [8]. Without going into details about the theory of TCM, its complex meridian-point system, Qi energy circulation and the law of five elements, it should be noted that for preventive and therapeutic purposes in daily practice, the so-called “independent/individual points” are used. These include a universal point S.36. Zusanli, called “Leg Three Miles” and LI.4. Hegu or UB.43. Gaohuang “Vitals” and many other Chinese points such as: “thoracic spine pains”: GV.10. (Lingtai); GV.11. (Shendao); UB.43. (Gaohuang); UB.15. (Xinshu); UB.45. (Yixi) [9]. A newer version of *acupuncture cups* are cups that have a magnetic “clavicule” (Figure 1f) with the south pole (S) directed towards the skin. The permanent mounting of the magnet makes it impossible to change the pole orientation, which can be done when using permanent magnets, as is the case with magnetopuncture [10]. Magnet cups are known as “Chinese Hacı cups.” Using this type of cup, we affect the body with as many as three types of stimuli, i.e.: 1) vacuum pressure (as in any cup); 2) pressure (analogous to acupuncture); 3) permanent magnetic field. The duration of the treatment ranges from a few minutes to less than twenty minutes.

Cupping in manual therapy

In treatment programs involving manual therapy, the cup is used right after performing passive mobilization or manipulation [11]. This involves passive mobilizations on both peripheral and spinal joints, mainly the

thoracic and lumbar regions of the spine. Fire and cold cups can be placed on these areas. The treatment is always performed “wet”, i.e. with the use of a lubricant to facilitate moving of the cup (olive oil, petroleum jelly, cream, etc.), or an agent that supports the therapy itself (ointment or gel). The duration of cup application is about 10 minutes. The aim of the cup treatment is to support the effect of mobilization (or manipulation) by helping to relieve tension of the periarticular tissues, which is changed as a result of blocking of the joint. For illustration, it is assumed that blockage occurs at the Th5 level (Figure 3).

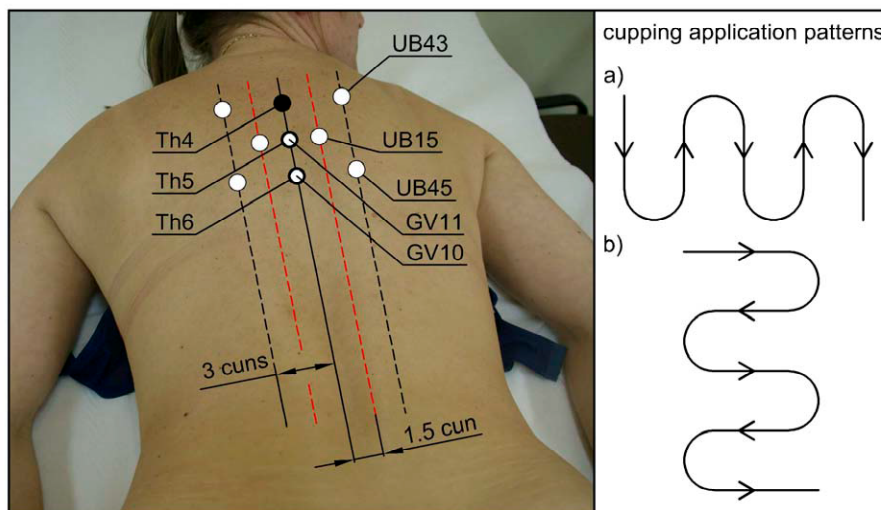


Figure 3. Chinese points – thoracic spine pains and patterns of cupping

Cup massage

Classic massage involves affecting body tissues with a mechanical factor. In traditional classic massage (“Swedish”), elastic tissue deformation occurs using techniques including, among others; stroking, rubbing, kneading, etc. In massage with a cup (or with two cups at the same time), tissue deformation is caused by moving the cup and the skin fold with it [12]. Cup massage is always performed “wet” (see “stationary cup”). For these massages, rubber or silicone cups are most often used. This form of massage in physiotherapeutic practice is most often used as an addition to manual massage. The treatment lasts from a few minutes to almost twenty minutes, and it is especially recommended for anti-cellulite therapy [4].

Combined cupping

The elements or components most often used for this type of cupping technique are heat, e.g. warm water (water cupping) or warm herbal stamps, an acupuncture needle (Figure 4) and cold generated by ice cubes [13]. For these purposes, fireless (glass or other cold) cups are used.

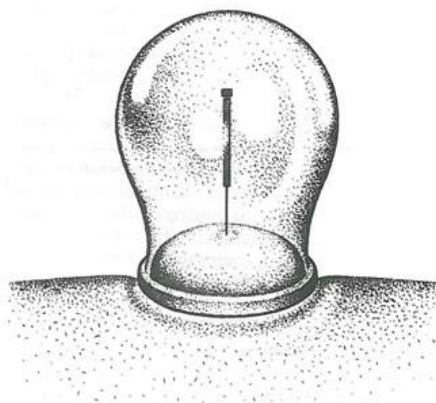


Figure 4. Cup combined with an acupuncture needle

Indications and contraindications

Cups can be used in basic or supportive therapy in many types of diseases and conditions associated with both internal organs and with the musculoskeletal system. The literature contains dozens of dysfunctions and diseases for which the healing effects of cups are used [2,3]. The indications for the use of cups often result from the knowledge of the mechanism of their action, which was presented above. Discussing contraindications is equally, if not more important.

Contraindications for the therapy include: extensive inflammatory skin changes, open wounds, varicose veins and fragility of blood vessels, elevated temperature (over 38.5°C), autoimmune diseases, active cancer, tuberculosis, convulsions, systolic hypertension (over 200 mm Hg), pregnancy, multiple sclerosis in remission, poor blood clotting, respiratory and/or circulatory failure, being under the influence of alcohol, anemia and general cachexia [4].

Discussion

In the history of western medicine, we can observe both periods of widespread use of cups and periods of departure from this form of therapy. The retreat from cupping therapy is particularly noticeable when there is introduction of a seemingly scientific approach to the treatment of diseases based primarily on pharmaceuticals (drugs) – in these instances, the recognition of cupping has often been deemed unworthy of the medical profession. The consequence of this has been the neglecting of valid scientific research and the discarding of knowledge and information about cup treatment from academic textbooks. In countries in the Far East, cups have been more widely recognized by doctors and have been the subject of teaching in medical schools since ancient times, and continue to the present day [5]. It has been estimated that cupping can be used to treat 363 diseases [14].

Many studies indicate the beneficial effects of cupping therapy, particularly in regards to its mechanistic action in the support of the immune system [15-18]. This provides the basis for describing the fire cup using the term 'antibiotic.' Vacuum therapy is also widely used in competitive sport – a notable example is of the outstanding American swimmer Michael Phelps, a multiple Olympic champion, who was seen to have traces of cupping on his skin during the 2016 Olympic Games in Rio de Janeiro [5].

Ahmad et al. [19] described in their studies the impact of cupping therapy on selected immunocytogenetic parameters. Forty four men aged 21-40 took part in the study. The patients were divided into two groups – experimental and control. Blood samples were taken from both groups – before cupping, one week after the treatment and three months after the treatment (in order to determine possible long-term effects of the therapy). The number of white and red blood cells (WBC and RBC, respectively) as well as hemoglobin (Hb) concentration were determined. Total complement activity (CH50) and immunocytological tests such as cell replication frequency (CRI) and sister chromatic exchange (SCE) test were also performed. The test did not show that SCE levels were significantly different between the experimental and control groups. There were also no statistically significant differences in the CRI test for both groups. It was only shown that WBC count after the treatment was increased compared to the control group while the other parameters, such as the number of RBC and Hb concentration, did not differ significantly. However, there were differences observed in total complement activity, but only in elderly people who took part in the study. Finally, no correlation was observed between cupping treatment and the cytogenetic parameters (CRI and SCE). Based on these study results, it can be assumed that cupping therapy plays a role in the activation of the complement system, as well as in cellular modulation of the immune response. Tagil et al. [20] conducted studies to answer the question: how does cupping therapy work in conditions such as acute and chronic inflammation, infectious diseases and disorders of the immune system? Thirty one healthy volunteers took part in the study. Blood samples were taken from each person before and after cupping. Serum nitrotoxin concentration, malondialdehyde levels, superoxide dismutase and myeloperoxidase activity were determined. It was shown that after using the cups, myeloperoxidase activity increased, superoxide dismutase activity decreased and there were higher levels of malondialdehyde and nitric oxide compared to blood collected before the treatment. This suggests that cupping therapy reduces oxidative stress and the level of free radicals. Also noteworthy are studies published by Gregory et al. [21] that show that cup massage increases tendon elasticity after previous damage. The study involved 30 people who had limited elasticity of the popliteal tendon. Cup massage therapy was found to increase the tendon range of motion by 10° and subjective changes in elasticity were reported by the patients themselves. In 2018, Azizkhani et al. [22] published a study that described the idiopathic treatment of menorrhagia with medroxyprogesterone acetate and a Chinese cup. The prospective, randomized study involved 162 women with

menstrual bleeding. The patients were divided into two groups – the study group underwent Chinese cupping treatments while the control group received medroxyprogesterone acetate (10 mg daily for the entire luteal period). The number of bleeding days and the degree of blood loss during menstruation were evaluated using a rating system involved a pictorial calendar of bleeding assessment (PBAC), where a PBAC >100 is considered to be excessive menstrual blood loss. Each patient was examined in this way before cupping treatment and implementation of medroxyprogesterone treatment at specified intervals (1 and 3 months after). It was shown that after 1 and 3 months, PBAC results were significantly lower in women treated with cups compared to women treated with medroxyprogesterone acetate. A reduction in bleeding time, by an average of one day, was also observed in the group of patients treated with cups compared to the control group. These results indicate that Chinese cupping therapy may be an effective way to reduce the intensity and shorten the duration of bleeding during menstrual periods compared to medroxyprogesterone acetate.

In light of the positive research, which also includes various case studies, on cupping therapy, the procedure could be an effective complementary, supportive method of treatment for various types of diseases and disorders. However, the exact mechanism of action of the therapy in specific diseases is still not fully known. Moreover, it should be noted that in European centers, such treatment methods are not very popular, and thus not many studies on the subject are conducted. Therefore, there is a growing need to foster scientific research on the medical use of cups.

The history of cupping therapy includes the popular, so-called ‘bloody cup’, which is also known as wet cupping [23,24]. The authors of an interesting publication [25] evaluated the frequency of the use of different types of cups, reviewing 550 works between 1958 and 2008, and showed that as much as 58% of cups used during that time were bloody cups (Figure 5). Various types of cups were used in 50 kinds of diseases. It should be added that 525 of these papers were published in Chinese and only 1 paper was in English, reflecting the discrepancy between Western and Eastern schools of thought in seeing cupping as a therapy.

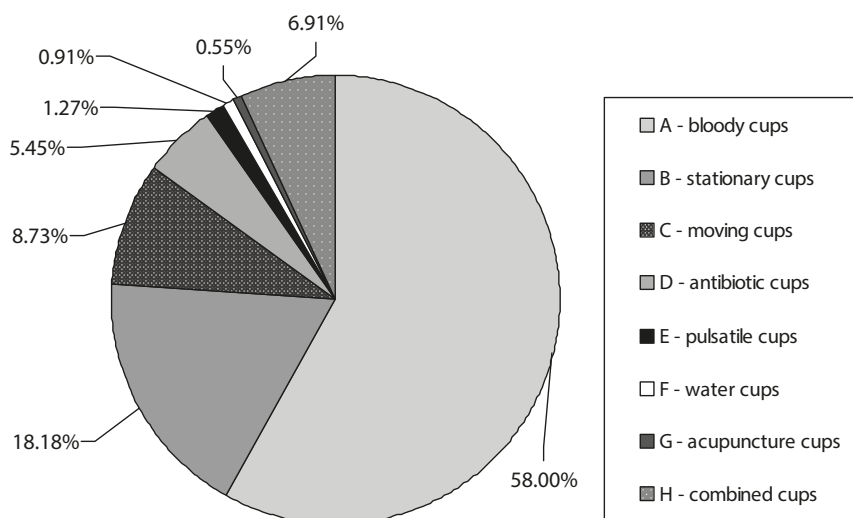


Figure 5. Percent distribution showing the frequency of various types of cup usage in China [25]

Today in Europe, people are moving away from bloody cupping. This form of cup was used in Poland until the middle of the 20th century [3]. Proponents of this method considered it especially suitable for men, as it was thought that women’s blood was purified through monthly menstruation. These views probably justified the method of phlebotomy, which was used in nearly every disease until the end of the 19th century. Phlebotomy that was performed four times in just 23 hours was the cause of death of Emperor Leopold II (1792). This was the subject of a press publication by the creator of homeopathy – Samuel Hahnemann (1755-1843). Hahnemann accused the imperial doctors of “malpractice” in causing the emperor’s death [26].

It is worth examining rubber (or silicone) cups. These cups are made of soft material, which makes it possible to place them on an uneven surface of the body (e.g. around the knee joint) where it is impossible to use a glass cup or a cup made of other types of hard material.

Specialists that use cups in medical therapy, biological regeneration or cosmetology have been waiting for a long time for the development of a soft transparent cup (Figure 1e). Recently, this type of cup has finally started to be produced. They enable the diagnosis of tissue changes and can successfully replace the Kibler technique used in segmental massage.

It is often difficult to assess the therapeutic value of the cup (vacuum) itself, in particular cups that involve other components such as magnets or acupuncture needles. It is assumed that these additional elements help strengthen the effect of the cup. In our opinion, there are some difficulties in objectively assessing some of the results from scientific studies on cups. To ensure the standardization of studies to effectively determine their reliability, we believe that only cold cups should be used because they allow for the unification of vacuum pressure level through proper calibration of the cup – this is important because vacuum pressure is the main factor that helps determine the therapeutic effectiveness of cups (Figure 6). In a fire cup, this condition is almost impossible to meet. Assuming, however, that a fire cup involves an additional element, i.e. heat (as mentioned previously in the description of the fire cup) one may assume that fire cups are more therapeutically effective; however, this is contradicted by some publications.

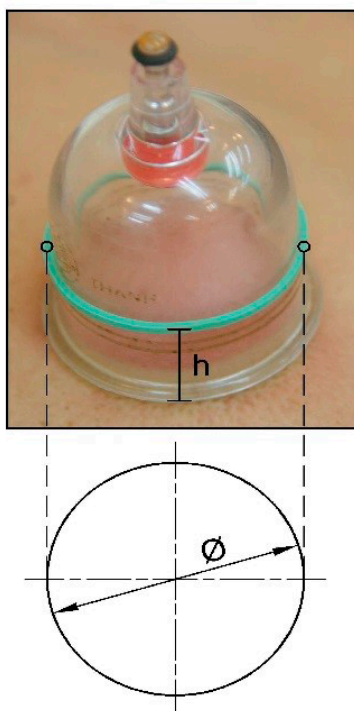


Figure 6. Cup parameters

Cups can also be used in the indirect assessment of the strength of skin reactions to a given ointment or gel. In one study, Frydrych [27] assessed the value of three types of gel (Profenid, Veral and Naproxen gel) using a cold glass cup, with parameters including skin suction to a height of 2 cm and an application time of 10 minutes. The strongest skin reaction (tissue hyperemia) observed indirectly indicated a higher therapeutic value for the particular gel that induced it (Figure 7).



Figure 7. Skin reaction after cupping

Conclusions

1. The therapeutic effects of the medical cup depend on several factors, mainly vacuum pressure, but also skin temperature under the cup and other forms of energy depending on the physical element or feature (i.e. heat) used in the cup.
2. Methods of cupping are based on the type of cup, purpose of use and the experience of the therapist. Cupping is a safe form of supporting various types of therapies, provided that the treatments are performed according to a strictly established procedure and consider contraindications.
3. The effects of fire cupping are generally more positive than those of a cold cup.
4. The use of cups on acupuncture points requires knowledge of traditional Chinese medicine, taking into account its practical side.
5. Scientific studies and experiments involving medical cups should follow rules of standardization and assess reliability.

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