



Wet-cupping removes oxidants and decreases oxidative stress



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KEYWORDS

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Summary

Objectives: Wet-cupping therapy is one of the oldest known medical techniques. Although it is widely used in various conditions such as acute/chronic inflammation, infectious diseases, and immune system disorders, its mechanism of action is not fully known. In this study, we investigated the oxidative status as the first step to elucidate possible mechanisms of action of wet cupping.

Material and methods: Wet cupping therapy is implemented to 31 healthy volunteers. Venous blood samples and Wet cupping blood samples were taken concurrently. Serum nitric oxide, malondialdehyde levels and activity of superoxide dismutase and myeloperoxidase were measured spectrophotometrically.

Results: Wet cupping blood had higher activity of myeloperoxidase, lower activity of superoxide dismutase, higher levels of malondialdehyde and nitric oxide compared to the venous blood.

Conclusion: Wet cupping removes oxidants and decreases oxidative stress.

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Abbreviations: MDA, malondialdehyde; iNOS, inducible nitric oxide synthase; SOD, superoxide dismutase; MPO, myeloperoxidase; HRV, heart rate variability; LP, lipid peroxidation; TBA, thiobarbituric acid; NBT, nitroblue tetrazolium; H₂O₂, hydrogen peroxide; NO_x, nitrite + nitrate.

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Introduction

Cupping is a traditional therapy dating back at least 2000 years. There are a lot of cupping applications in practice such as needle cupping, moving cupping, retained cupping, medicinal (herbal) cupping and bleeding cupping (wet cupping). The last one is the most commonly used cupping type.¹ Each kind of cupping therapy may be used for different diseases or different purposes of treatment.¹ In general, a glass cup is applied on the skin over an acupuncture point, painful area, or a reflex zone. This treatment creates a vacuum over certain points on the skin.² Some researchers hypothesize that implementation of cups on selected acupoints on the skin results in a therapeutic effect by hyperemia.³

The most conditions in which wet cupping therapy is commonly employed were pain related conditions including chronic muscle pain, fibromyalgia, herpes zoster pain and neuralgias such as headache and sciatica. Also, cupping therapy is used in many other abnormalities such as cough or asthma, acne, common cold, urticaria, facial paralysis, soft tissue injury, arthritis, neurodermatitis.¹

The main purpose of this therapy is to precipitate the circulation of blood and to remove blood-stasis and waste from the body. Local damage of the skin and capillary vessels may act as a nociceptive stimulus.² Cupping is thought to remove noxious materials from skin microcirculation and interstitial compartment.⁴

Wet cupping has been claimed to drain excess fluids and toxins, loosen adhesions and lift connective tissue, bring blood flow to skin and muscles, and to stimulate the peripheral nervous system.⁵ Also, cupping is said to reduce pain and high blood pressure as well as modulate neurohormones and the immune system.² Cupping therapy is also used to improve subcutaneous blood flow and to stimulate the autonomic nervous system.²

Free oxygen radicals formed during physiological and pathophysiological metabolism are balanced by a similar rate of their consumption by antioxidants. Although their excess production may cause oxidative damage on biological molecules, cell membranes and tissues, their generation is inevitable for some metabolic processes.⁶ Free radical-mediated oxidative damage has been implicated in the pathogenesis of a large number of diseases, including autoimmune diseases of endocrine glands,⁷ cancer,^{8,9} inflammatory diseases,¹⁰ cardiovascular disease, (atherosclerosis, hypertension, ischemia/reperfusion injury),¹¹ diabetes mellitus,¹² neurodegenerative diseases (Alzheimer's disease and Parkinson's disease),¹³ rheumatoid arthritis,¹⁴ and ageing.¹²

A recent study showed cupping had therapeutic effects on myocardial infarctions and cardiac arrhythmias in rats.¹⁵ Also, another recent study investigated the possible useful effects of cupping therapy on cardiac rhythm in terms of heart rate variability (HRV). All HRV parameters increased after cupping therapy compared to before cupping therapy in healthy persons. They suggested that cupping might be cardio protective. It can be stated that cupping therapy restored sympathovagal imbalances by stimulating the peripheral nervous system.¹⁶

As seen, wet cupping is widely used in many cases mentioned above which are associated with oxidative damage.¹⁷

We wondered if wet cupping therapy affects oxidative balance or not.

The aim of this study was to investigate the dynamics of oxidative stress and antioxidant status markers in both venous blood and wet cupping blood of healthy volunteers by measuring the levels of malondialdehyde (MDA), nitrite, and the activities of superoxide dismutase (SOD) and myeloperoxidase (MPO). The originality of our study is that we simultaneously measured all these parameters in wet cupping and venous blood samples of healthy people for the first time in the literature.

Materials and methods

Subjects and study design

Our study population consisted of 31 healthy volunteers, 15 females and 16 males; aged 21–40 years (mean age 30.24 ± 9.53 years). Venous blood samples were collected after overnight fasting and just before wet cupping employment and placed into no-additives-containing tubes. Wet cupping blood samples were taken from the cups after bleeding and vacuum applications and placed into the test tubes. Serum fraction was obtained by centrifugation ($2000 \times g$, 10 min, and 4°C) after storing the whole blood at room temperature (approximately 10 min) and stored at -80°C until analysis.

Participants who had serious conditions of the spine and spinal cord (e.g., Ankylosing spondylitis), infectious disease, malignancy or immune disorder were excluded. Cupping therapy involves an invasive procedure, so participants who had blood-borne diseases or hemostatic abnormalities, such as AIDS, active hepatitis, syphilis, hemophilia and anemia, or took anticoagulants or antiplatelet agents, such as warfarin, aspirin were excluded. Written informed consent was obtained from each participant and study protocol was accepted by local ethic committee.

Wet cupping

All cupping procedures were applied by two physicians certificated by British Cupping Society and Natural Health Institute. For the cupping therapy, sterile disposable cups of 5 cm in diameter were used. Five points of the posterior neck, bilateral perispinal areas of the neck and thoracic spine were selected for treatment (Fig. 1). Same points were applied to all participants. Application areas were cleaned with antiseptic solutions. Cups were placed to these points and negative pressure applied by cupping pump. Two-three minutes were waited and cups removed. Then, the skin was punctured to a 2-mm depth within the cupping sites with 26-gage disposable lancets. After this, the pumping with vacuum was applied for the second time and 3 to 5 cm³ of blood was drained per cupping site. Application sites were covered the sterile pads.

We did not experience any adverse reaction but fainting due to intolerance to pain might have been possible, a doctor, a nurse and emergency response kit—stretcher were kept ready in application room.

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