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Evaluation of Changes in Health and Complete Blood Count after Wet Cupping

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Abstract

Objective: Many traditional medicine approaches are still preferable. One of the most worldwide utilized methods of traditional medicine is cupping therapy. Although cupping therapy is being used routinely in Persian Medicine (Unani Medicine), all the beneficial result of this procedure has not been proven. In this study, we are aiming to examine the effect of wet cupping therapy (WCT), type of bloodletting, on the health level and hematology factors (CBC parameters) in some healthy people in the city of Mashhad. Methods: Participants are divided randomly into two groups of 41 men in WCT group and 40 men in control group (CG). Blood was taken once before the intervention also one week and four weeks after the intervention to measure hematological factors. The Persian version of general health questionnaire -28(GHQ-28) was used to analyze the effect of this intervention on quality of life. Results: The study results were demonstrated that WCT has a positive effect on health level (P=0.001). Hemoglobin (HB), mean corpuscular hemoglobin (MCH) and Mean corpuscular hemoglobin concentration (MCHC) were decreased significantly in the WCT group after the procedure (P=0.001). Improving the health level had a positive correlation with decreasing the HB, MCH and MCHC. Conclusions: Our results demonstrated the beneficial effect of WCT on health. Blood viscosity changes after wet cupping therapy may cause health improvement due to decreasing the HB rate. It is suggested that WCT may be used to enhance physical and psychological health.

Keywords: Health, Unani Medicine, Bloodletting, Complete Blood Count (CBC), Persian Medicine, Wet Cupping Therapy.

Introduction

There is an increasing appeal of traditional and complementary/alternative medicine throughout the world recently (Mahdavi et al., 2012). In Persian Medicine (PM), another name is Unani Medicine, there are five methods of blood taking (bloodletting) including phlebotomy (fasd), Wet cupping, leeching, ear stinging and blood rising from the nose. Among all these approaches "hejamat" (Persian) or "hijama" (Arabic) which means "sucking" was familiar among different cultures in Europe and Eastern Asia such as cupping with some differences in each region (Montazer & Namavary, 2016).

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Wet-cupping therapy (WCT) is the most utilized approach of cupping in PM.WCT is done mostly between shoulders which call hejamt aam, also can be done on head, legs and waist. The way WCT work is to place a plastic cup on the selected body part, used as suction, then lacerate the area finally put the cup back again to drain the blood and interstitial fluids from the skin's micro circular, and the procedure should be repeated three to five times to drain blood completely (El Sayed et al., 2014).

WCT was used in PM for both treatment and prevention of various diseases (Kordafshar et al., 2015). There are different characteristics of the cupping region of hejamat-e aam which may contribute to its beneficial results. These features include the availability of brown adipose tissue or brown fat on the upper back of the chest and neck toward the shoulders (Ghods et al., 2016; Yao et al., 2011). The proximity to the main vessel divisions carrying blood from the heart to the brain. The proximity to the sympathetic ganglia (stellate ganglion) and the thoracic duct (Arslan et al., 2014). Based on Chinese medicine the passage of five important channels of acupuncture, which can be stimulated by WCT and release trapped energy in the channels and can help it flow correctly (Kim et al.,2011). Several studies show that WCT may have positive effects on blood high-density lipoproteins (HDL), low-density lipoprotein *(*LDL), and cholesterol (Mahdavi et al., 2012; Zarei et al., 2012). The researches have been shown that WCT can reduce LDL and cholesterol even a month after treatment. The most reported positive result of cupping therapy is the pain relief effect (Cao et al., 2015; Dal et al., 2007), acne (Wang wt al., 2008), herpetic lesions (Cao et al., 2010), coughing and asthma (al-Jawad et al., 2011; Goodwin et al., 2011), eczema (Yao et al., 2007), migraine (Tabatabaee et al., 2014) and back pain (AlBedah et al., 2015). Another beneficial effect of WCT is the improvement of the quality of life. According to Kordafshari et al., WCT can increase the quality of life one month after the treatment (Kordafshari, et al., 2017).

The purpose of this study was to evaluate the effect of WCT on the quality of life and its effect on complete blood count (CBC) changes in healthy male people.

Materials and Methods

Trial design and participants

This is an observational pre-post study to investigate the effect of wet cupping on general health and different blood parameters. All the men participants are gathered through a recall of Persian Medicine Clinic in Persian Medicine College of Mashhad University of Medical Sciences, Mashhad, Iran. The total number of subjects who participated in the study was 86. Participants were randomly divided into two groups according to the random number table generated by a computer. The WCT group included 45 and control group(GP) included 41 males. The data were taken from the records of the patients who attended that clinic during May 2017. From all subjects, 41 of WCT and 40 of GP matched the inclusion and exclusion criteria and participated to the end of the study. This study was registered online on Thai Clinical Trials Registry with TCTR20160609004 code.

Inclusion criteria consisted of healthy men age ranged between 25 to 40 years old, weight above 50 kg and with Body Mass Index (BMI) between 20-30. All participants had normal body temperature as 37±0.5 degree centigrade additionally, blood pressure was130/85±10 mmHg. All individuals confirmed that they didn't have a history of chronic diseases such as diabetes, coronary and pulmonary disease, anemia, coagulation disorders, neurology and psychiatry disease, severe infectious, allergic disease or taking any anti-allergic medication. Every applicant who scored the General Health Questionnaire-28(GHQ-28) (Goldberg & Hillier , 1979) over 61 and the ones who were overweight (BMI >30) excluded from the study. Exclusion criteria consisted of who missed any blood sampling steps or who became infected with any disease during the study.

Before the intervention, a verbal explanation was given to the eligible subjects, and their signature on the consent form was obtained. All participants were examined by PM specialists. The Persian subtitle of the GHQ-28 which was presented by Goldberg and Hiller was employed (Goldberg & Hillier , 1979). The GHQ-28 was translated and approved in Iran in many studies including (Ebrahimi et al., 2007).This questionnaire analyses four different scaling factors including physical disorders, Anxiety, depression signs and social functions. The information obtains from the questionnaire can also be using to detect Physical and mental health level. The score up to 22 is considered healthy, 22 - 40 considered as low, 41- 60 considered as medium and up to 84 considered as severe disorders.

Intervention

The amount of venous blood was taken from each volunteer before the intervention was 3 ml. The tube (BD Co., England) with K3 EDTA anticoagulant was used to perform complete blood count (CBC) during this procedure. For the WCT group, the area between the shoulders was disinfected by rubbing alcohol, followed by oil treatment and slider cupping. Fixed cupping was performed on the Aam WCT area and around it until the skin expanded and got red. Then cups were exchanged with a 100 or 120 ml cup for 1 to 2 minutes with negative pressure cupping between T2 and T4 on the backbones. Then the cup was removed and 7 times scrapes in 3 rows (0.5 mm in depth) were appled by scalpel No. 22 (Blood-letting was continued about three times by applying a new disposable clean cup). In the end, the area of

the procedure was cleaned up with distilled water and was dressed with honey. For the control group, no intervention has been made. The second blood sample was taken one week after the procedure in the amount of 3 ml. The same thing repeated on the 4th week after the procedure as well. Measurement of the CBC test was conducted from both groups. The general health questionnaire was taken from both groups before intervention and at week 4 after treatment.

Outcome

The venous blood was used to carry out CBC test include measuring red blood cell (RBC), white blood cell (WBC), hemoglobin (HB), hematocrit (HCT), mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), mean corpuscular hemoglobin concentration (MCHC), platelet (PLT), before, one week and also four weeks after the intervention. The General health questionnaire (GHQ-28) was used in the beginning and the end of the intervention. Neutrophil (NOT), lymphocyte (LYM), monocyte (MNO), basophile (BAS) and eosinophil (ESO) were also measured, but since the changes were not significant, they were not reported.

Measuring method:

CBC test from each of the blood tubes were measured within 3 hours of the sampling using an automated cell counter (Hemaray83 cell counter, PIOWAY, Jiangsu, China).

Statistical analysis:

The calculated sample size was 40 for each group based on previous studies and the Cochran formula with 5% error. Baseline data were presented as the mean ± standard deviation. All statistical parameters were analyzed with SPSS version 19.0 .Generalized Estimating Equations (GEE) method was used to analyze the differences in hematological factors in each group before the intervention as well as first and the 4th week. According to a normal distribution of data, paired t-test analyses were used to compare mean score of GHQ-28 in each group before and four weeks after the intervention. Independent t-test also was used to compare the difference in mean hematological factors before the intervention, 1 week and 4 weeks after intervention between groups.

Results:

All the participants in this study were male, average age 31.86 ± 6.28 SD and 33.61 ±6.4 SD in WCT and control respectively. Table 1 demonstrates the clinical characteristic of all participants. The mean of these variables did not have significant differences between the two groups. The GHQ-28 statistical analysis in WCT and control groups shows that well-being rose in both groups (GHQ-28 score drops) but change was only significant in the WCT group (p=0.001, t=6.42) (Table 2). Table 3 shows descriptive statistics of hematological factors in 3 deferent stages

Table 1. Clinical characteristics of each group

	WCT (Mean ± SD)	control (Mean ± SD)
Age	32.90±6.28	33.80±6.4
Height	175.19±5.61	177.05±6.19
Weight	79.24±10.92	81.17±12.04
BMI	25.82±3.4	25.84±3.22

Table 2. General health association with study interventions

General health	**Intervention**	**Before intervention (Mean ± SD)**	**After intervention (Mean ± SD)**	**Paired- T-test (P value)**
Intervention	WCT	16.02 ± 6.1	14.7 ± 5.4	**0.001**
	control	19.8 ± 9.5	19.7 ± 9.2	0.89
Independent- T Test (P value)		0.037	0.003	

Table 3. descriptive statistics of hematological factors in 3 deferent stages

Hematological factor	**Before intervention (Mean ± SD)**			**One week after intervention (Mean ± SD)**			**Four weeks after intervention (Mean ± SD)**		
	WCT	**control**	**P value***	**WCT**	**control**	**P value***	**WCT**	**control**	**P value***

WBC (µl)	7.5±1.6	7.4±2	0.508	7.5±2	7.09±1.7	0.150	7.4±1.6	7.2±1.5	0.496
RBC (µl)	5.3±0.4	5.2±0.3	0.24	5.2±0.4	5.1±0.3	0.35	5.27±0.4	5.3±0.3	0.97
HB (g/dl)	15.5±0.9	15.5±1	0.45	15.3±1.1	15.4±1	0.41	14.94±1	15.6±1	**0.007**
HCT (%)	45.1±2.5	45±2.6	0.830	44.29±3	44.5±2.6	0.69	45.5±2.4	45±2.6	0.426
MCV (fl)*	85.8±4.6	86.7±3.2	0.24	85±3.7	86±3.5	0.341	86.2±4	85.5±3.5	0.453
MCH (pg)**	29.05±2	29.7±1.6	0.052	29.2±1.5	29.7±1.7	0.167	28.4±1.5	29.6±1.6	**0.001**
MCHC (%)	33.9±0.9	34.3±1.2	0.065	34.4±0.9	34.7±1.7	0.276	32.9±0.9	34.5±1.2	**0.001**
PLT (µl)	235±49	259±61	0.38	243±46	255±55	0.76	238±49	261±66	0.19

*Association of the analyzed parameter for each sampling time between two groups.

** P values that have been underlined and in bold show significant changes.

The statistical details related to the GEE method are shown in Table 4. According to Table 4, WBC and PLT count showed non-significant Changes (p=0.686-p=0.165). The Changes of RBC count were become significant over the time (P=0.00). RBC count in the WCT and control groups decreased and increased, respectively. The pattern of RBC changes was shown in Figure 1. The HB changes were also become significant over the time (p=0.038). In the first week, decreased of HB was observed in both groups, but at the end of the fourth week, HB rate decreased in the WCT group and increased in the control group. The pattern of HB changes was shown in Figure 2. The HCT rate showed non-significant changes over the time (p=0.292). The HCT rate was decreased in the first week and increased at the end of the fourth week in both groups. Contrary to expectations, there was no discrepancy between the two groups in the rate of HCT. The pattern of HCT changes was shown in Figure 3. The MCV changes were become significant over the time (p=0.001). In the first week, MCV was decreasing in both groups, but at the end of the fourth week, MCV rate increased in the WCT group and decreased in the control group. The pattern of MCV changes was shown in Figure 4. The MCH changed were not significant over the time (0.371). The MCH rate decreased in both groups, but, its reduction was more in the WCT Group. The MCHC did not have any significant changes over the time (p=0.427), But MCHC rate was reducing in the WCT group. There were significant differences in the rate of RBC, HB, MCH, MCHC and MCV between the two groups over the time (table 4). During the four weeks mean rate of RBC, HB, MCH , and MCHC in WCT group were 0.003, 0.018 and 0.021 unit less than control group, respectively (p=0.05 - p=0.00 - p=0.005 - p= 0.00). The mean rate of MCV in the WCT group was 0.046 unit more than control group (P=0.004).

Table 4. The statistical details related to the GEE method

Hematological factor	**Parameter**	**B*****	**Std.Eror**	**Wald Chi Square**	**df**	**P value****
WBC(µl)	WCT	0.398	0.3420	1.353	1	0.245
	Time	-0.005	0.0059	0.787	1	0.375
	WCT*Time	-0.004	0.0097	0.164	1	0.686
RBC(µl)	WCT	0.10	0.070	1.98	1	0.158
	Time	0.004	0.0009	21.152	1	**0.00**
	WCT*Time	-0.003	0.0018	3.659	1	**0.05**
HB(g/dl)	WCT	-0.102	0.1968	0.268	1	0.605
	Time	0.007	0.0031	4.327	1	**0.038**
	WCT*Time	-0.018	0.0048	13.341	1	**0.00**
HCT (%)	WCT	-0.051	0.5073	0.010	1	0.919
	Time	0.010	0.0092	1.108	1	0.292
	WCT*Time	0.013	0.0132	1.012	1	0.315
MCV (f.)	WCT	-1.079	0.7282	2.198	1	0.139
	Time	-0.031	0.0098	10.202	1	**0.001**
	WCT*Time	0.056	0.0192	8.526	1	**0.004**
MCH(pg)	WCT	-0.533	0.3292	2.621	1	0.105
	Time	-0.004	0.0043	0.801	1	0.371
	WCT*Time	-0.021	0.0076	7.874	1	**0.005**
MCHC (%)	WCT	-0.222	0.2235	1.037	1	0.309
	Time	0.004	0.0050	0.631	1	0.427
	WCT*Time	-0.046	0.0067	46.417	1	**0.00**

PLT(µl)	WCT	-10.563	10.7850	0.959	1	0.327
	Time	0.134	0.1538	0.756	1	0.384
	WCT*Time	-0.354	0.2549	1.930	1	0.165

* P values that have been underlined and in bold show significant changes.
**Association of the analyzed parameter for each group during four weeks.
*** Regression coefficient

The general health quality was correlated with weight, BMI, and platelet. This means by increasing of these factors, GHQ-28 score rose and the consequent can effect the health level negatively. The difference in health level score before and 4 weeks after the intervention was correlated with differences in HG, MCV, MCH, MCHC before and four weeks after the intervention (table5). These data show that enhancing of health level is associated with decreasing of HG, MCH and MCHC and increasing of MCV in blood.

Table 5. Correlations between health and blood parameters

parameter		GH*	HG	MCV	MCH	MCHC
Mean ± std		0.679±1.4	0.162±0.66	0.38±1.8	0.51±0.87	0.52±1.2
correlation	z	1.00	-0.329	0.258	-0.311	-0.327
	P value	0	0.003	0.019	0.005	0.030

General health*

Discussion

WCT is a procedure used in PM for treatment as well as prevention. There is a hypothesis based on clinical findings that shows WCT can improve health level. Many studies analyze the positive effect of WCT on different pain reduction and some disease treatment (Zarei et al., 2012; Dal Kwon et al., 2007; Wang et al., 2008; Yao & Li, 2007; Tabatabaee et al., 2014). Since WCT is based on ancient medicine, nowadays this procedure is becoming more popular and common around the world especially in the Middle East. Although the number of researches showed the efficacy of WCT in some diseases, more researches are needed to better understand its efficacy. Another beneficial factor made WCT more popular is that the procedure is a non-chemical and non-pharmacological. There is not any report of antagonistic effects of WCT with any therapeutic drug or pharmacological treatments (Mahmoud et al., 2013). Kordafshar et al. study revealed that WCT can improve general health while using a different questionnaire (SF-36) (Kordafshari et al., 2017). Besides, a study by Ahmed et al. topical cupping showed an improvement of clinical conditions in rheumatoid arthritis patients (Ahmed et al., 2005). El Sayed et al. study demonstrated that WCT may treatment iron overload condition in thalassemia (El Sayed et al., 2014). Also, a study by Dons'koi et al. reported that cupping therapy decreases the number and the activity of the natural killer cells (NKc) (Dons et al., 2016). Although WCT consists of a blood-letting, it was proved that anemia was not a side effect of it (Farhadi et al., 2009). Previous study results of analyzing of differences between venous blood and blood from the cupping area show that concentrations of HDL, LDL, TG, and cholesterol in cupping blood were significantly higher than venous blood, thus, it may have effects on preventing hyperlipidemia formation (Mahdavi et al., 2012; Niasari et al., 2007).

The main aim of our study was to investigate the effect of wet cupping on the health and CBC parameter. The increase in health level in the WCT group was observed in this study. Our previous findings reported that WCT may improve well-being by changing the blood viscosity which also has been proven by other studies (Sebastian et al., 2018). This influence may be a result of dropping in materials suspended in blood. It was demonstrated in previous studies that cholesterol, urea, HDL, and FBS are decreased after WCT (Ranaei-siadat et al., 2010). Another important factor in assessing blood viscosity is RBC count (Sarin , 2010). The Rate of RBC, HB, MCH, and MCHC were reduced during the study in the WCT group. Although there is only 70-100 ml blood-letting in WCT, the amount of HB was dropping one month after treatment. MCV rose in the WCT group. In another way rising the health level was just associated whit decreasing the rate of HB, MCH and MCHC and increasing the rate of MCV.

Conclusion

Since the study was down on healthy men, all changes were within the normal range, but the optimal amount in the normal range is unknown. From the findings of this research, this theory is generated that the WCT can be effective in improving health by low variation in blood parameters in normal range. The reduction of HB in normal range may be also associated with increasing of health levels and well-being. More researches in normal, high and low RBC count are needed to recognize the relation between count of RBC and well-being.

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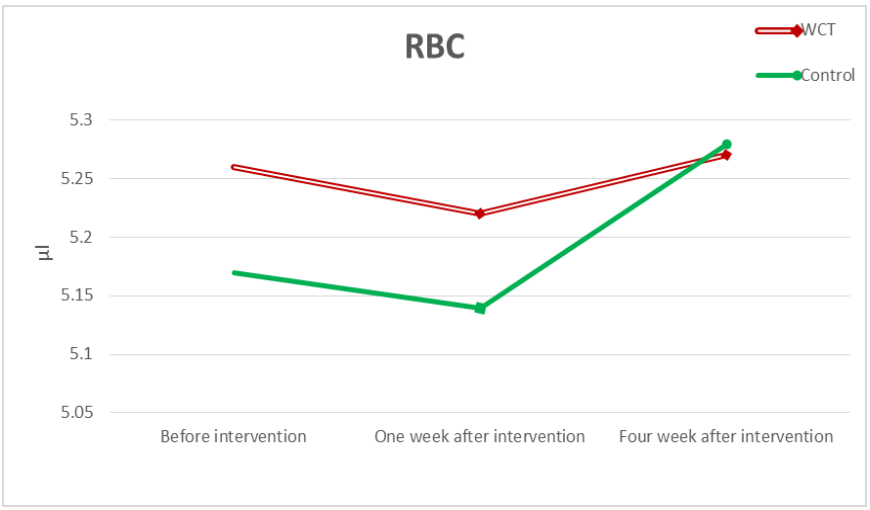

Fig. 1: The pattern of RBC changes (mean ± SD)

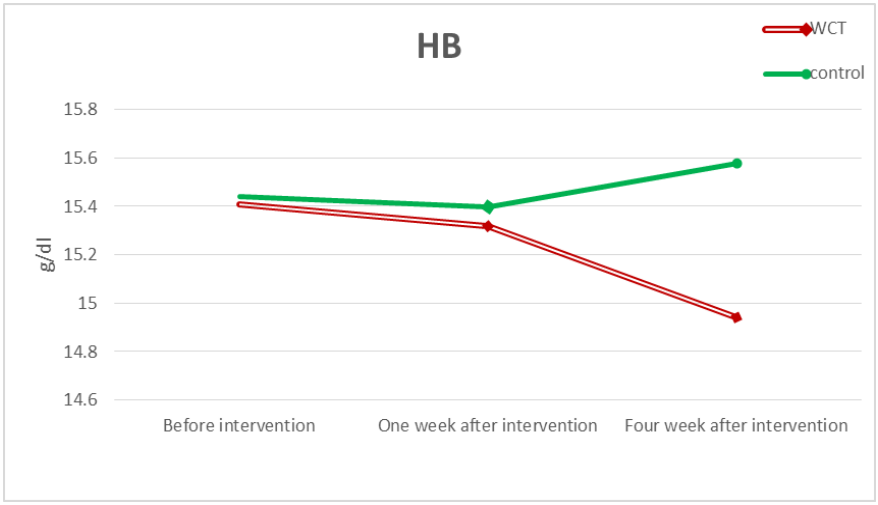

Fig. 2: The pattern of HB changes (mean ± SD)

Fig. 3: The pattern of HCT changes (mean ± SD)

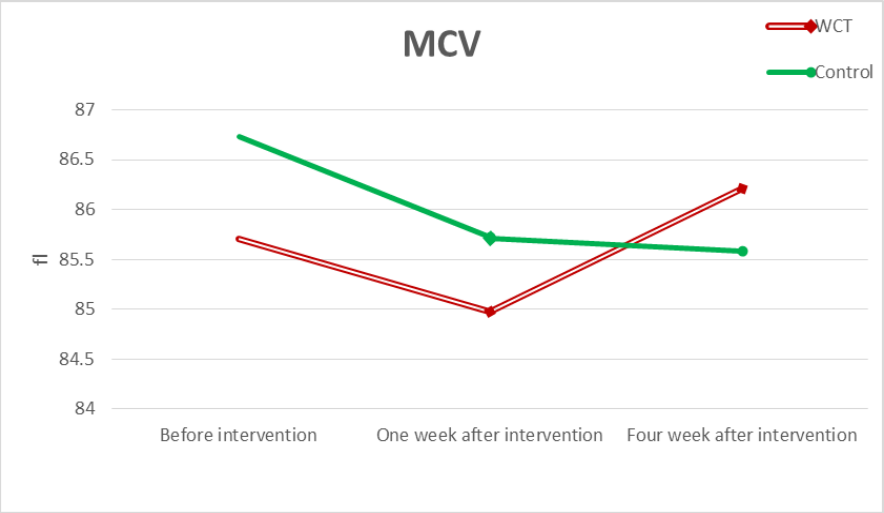

Fig. 4: The pattern of MCV changes (mean ± SD)